ASME IMECE® 2024

International Mechanical Engineering Congress & Exposition®

Program

CONFERENCE
November 17-21, 2024
EXHIBITION
November 18-20, 2024
COMMITTEE MEETINGS
November 15-21, 2024

Oregon Convention Center
Portland, OR

https://event.asme.org/IMECE

The American Society of Mechanical Engineers®
ASME®

ASME
SETTING THE STANDARD

WELCOME FROM THE TECHNICAL CHAIR

Welcome to the ASME 2024 International Mechanical Engineering Congress and Exposition (IMECE) in Portland, Oregon. This year's IMECE is set to be the flagship event for the mechanical engineering community, with representation from over 50 countries. We are experiencing significant growth, with over 20% more talks compared to last year. Additionally, we are excited to introduce Agency Day, designed for networking and learning from government funding agencies, along with a revamped focus on industry participation. IMECE 2024 is the place to be for engineers, researchers, and innovators to come together, exchange ideas, and drive the future of mechanical engineering.

With 18 Technical Tracks and over 1,900 presentations and posters, IMECE 2024 offers a comprehensive technical program that spans both historical and emerging subdisciplines in mechanical engineering. The new Advancements in Industry Track provides industry R&D executives and professionals with a platform to share challenges, present case histories, and collaborate with ASME's academic research community. Nearly every track also features Student Competitions, showcasing the creativity and talent of the next generation of engineers.

One of the highlights this year is the inaugural ASME Rising Stars of Mechanical Engineering Showcase and Celebration, featuring at least $50 million worth of award-winning research projects under a single roof. These projects, supported by agencies such as the NSF, ONR, AFOSR, DARPA, and DOE, showcase research shaping the future of engineering.

We've organized IMECE 2024 to offer plenty of networking opportunities throughout the week. The Opening Welcome Reception has been moved from Sunday to Monday evening, giving attendees an ideal chance to connect with colleagues and explore innovations from exhibitors. Extended coffee breaks have been included this year to provide time to maximize interactions between sessions, while daily lunches from Monday through Wednesday offer additional opportunities to network and visit exhibitors. New for 2024, we've added a Closing Reception on Thursday, giving one final opportunity to exchange contact information and connect with fellow attendees. For students and early-career professionals, the ElevateME program offers workshops, sessions, and networking opportunities designed to foster growth and innovation. Additionally, the Women in Engineering Panel and Reception provides a space for mentorship, dialogue, and professional development.

This year's technical program features an outstanding lineup of keynote speakers, including Evelyn Wang, Ph.D., Director of ARPA-E; M. Stanley Whittingham, Ph.D., Nobel Prize in Chemistry recipient; Susan Margulies, Ph.D., Assistant Director of the National Science Foundation, and Madiha El Mehelmy Kotb, ASME Past President. Their insights will inspire us to explore new frontiers in engineering.

This year's conference is supported by over 10 generous sponsors, whose contributions are vital to making this event a success. We are thrilled to host IMECE 2024 in Portland, a city known for its vibrant innovation and sustainability efforts. On behalf of the Conference Steering Committee, I extend my deepest thanks to the volunteers, track chairs, symposium organizers, and ASME staff who have worked tirelessly to bring this event to life. We look forward to an exciting and productive IMECE 2024 and welcome you to Portland!

Reuben Kraft
IMECE 2024 Technical Program Chair
Professor, Penn State University

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Albert Ratner
General Conference Chair
University of Iowa

Reuben Kraft
Technical Program Chair
Penn State University

Wenbin Yu
Technical Program Co-Chair
Purdue University

Marriner Merrill
Steering Committee Chair
Rochester Institute of Technology

Dumitru "Micky" Caruntu
Steering Committee Vice Chair
The University of Texas – Rio Grande Valley

Christopher Depcik
Steering Committee Senate Chair
The University of Kansas

Alberto Cuitino
Steering Committee Senate Member
Rutgers – The State University of New Jersey

Olesya I. Zhupanska
Steering Committee Senate Member
The University of Arizona

George Kardomateas
Steering Committee Senate Member
Georgia Institute of Technology

Rama Koganti
Steering Committee Senate Member
University of Texas Southwestern Medical Center

Assimina Pelegri
Steering Committee Senate Member
Rutgers – The State University of New Jersey

Stephen D. Tse
Steering Committee Senate Member
Rutgers – The State University of New Jersey

Ying Sun
Member at Large
Vanderbilt University

Caterina Rizzi
Member at Large
Università degli Studi di Bergamo

Parisa Saboori
CSC Special Member
Manhattan College

Sayan Biswas
CSC Special Member
University of Minnesota

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.

ASME (Booth 807)
150 Clove Road
Little Falls, NJ 07424 USA
+1 800-THE-ASME (800-843-2763)
www.asme.org

ASME is a not-for-profit membership organization that enables collaboration, knowledge sharing, career enrichment, and skills development across all engineering disciplines, toward a goal of helping the global engineering community develop solutions to benefit lives and livelihoods. Founded in 1880 by a small group of leading industrialists, ASME has grown through the decades to include more than 140,000 members in 151 countries.

For more than 100 years, ASME has successfully enhanced performance and safety worldwide through its renowned codes and standards, conformity assessment programs, training courses, and journals.

ASME also produces nearly 40 international conferences. These industry-leading events feature advanced research and technical content spanning a range of industries impacted by mechanical engineering, including energy production, energy sources, advanced manufacturing, and engineering sciences.

While at the IMECE, please take time to visit the ASME booth in Exhibit Hall G on the first floor of the Oregon Convention Center for information about ASME's Transactions Journals, conference proceedings, ASME Press Books, Codes & Standards, and Catalogs. Representatives from the ASME Digital Collection will be present to answer your questions.

AUTHORS

SPEAKERS' PRACTICE ROOM

Room E143 on the second floor of the Oregon Convention Center is the Authors'/Speakers' Practice Room. The schedule is Monday–Thursday, October 30–November 2, 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.

SCANNING

All authors are required to have their badge scanned before entering a technical session. Only fully registered authors are allowed to attend plenary and technical sessions.

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 2024 conference badge in order to gain admission to conference sessions/events/activities. No one will be admitted to the technical sessions unless he/she is registered and is wearing a badge that shows "Full Conference."

CHILDCARE SERVICES

We are pleased to once again offer childcare reimbursement for attendees of IMECE 2024. For those who need childcare services, ASME will reimburse up $250 for services incurred by a licensed service provider in Portland, OR. This offering will be available November 17–21, 2024 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, 2024. 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.*

NW Nannies LLC
NW Nannies offers babysitting and nanny services to travelers visiting the Portland Metro Area — providing them and their families peace of mind. All nannies are professional childcare providers and are completely vetted.
503-245-5288
https://nwnannies.net/

WeVillage
Offers drop-in rates.
818-233-8218
https://www.wevillage.com/Portland

Little Vikings
Flexible childcare center.
503-725-8800
https://www.pdx.edu/students-with-children/little-vikings

COAT CHECK

There is a complimentary coat and bag check available in room G131 at the Oregon Convention Center. Below is the date and times it will be available:

Thursday, November 21	**7:30AM–6:00PM**

CONTINENTAL BREAKFAST

Continental breakfast will be served on Monday, November 18 through Thursday, November 21 in the Oregon Ballroom in the Oregon Convention Center. Fully paid attendees are entitled to attend. The schedule is as follows:

Monday, November 18	**7:30AM–8:00AM**
Tuesday, November 19	**7:30AM–8:00AM**
Wednesday, November 20	**7:30AM–8:30AM**
Thursday, November 21	**7:30AM–8:00AM**

EMERGENCY INFORMATION

Alert convention center staff by picking up a house phone 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 Hall A on the first floor of the Oregon 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 18	**12:00PM–7:00PM**
Tuesday, November 19	**12:00PM–4:00PM**
Wednesday, November 20	**12:00PM–4:30PM**

LUNCH

Conference lunches will be served Monday–Wednesday, November 18–November 20, in Hall A of the Oregon Convention Center. On Thursday, November 21, lunch is served in Oregon Ballroom. Fully paid attendees are entitled to attend. The schedule is as follows:

Monday, November 18	**12:15PM–1:15PM**
Tuesday, November 19	**12:30PM–1:30PM**
Wednesday, November 20	**12:15PM–1:15PM**
Thursday, November 21	**12:00PM–12:30PM *Oregon Ballroom**

MEETING INFORMATION

Meeting information is located in the Oregon Convention Center across from Hall A and Registration. The operating hours are:

Sunday, November 17	**1:00PM–5:00PM**
Monday, November 18	**7:00AM–6:00PM**
Tuesday, November 19	**7:00AM–6:00PM**
Wednesday, November 20	**7:00AM–6:00PM**
Thursday, November 21	**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.

MOTHER'S ROOM

The Oregon Convention Center has Mamava near exhibit Halls A and E.

OPENING RECEPTION

Monday, November 18
5:30PM–7:00PM
Hall A, Oregon 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 18
5:30PM–7:00PM
Hall A, Oregon 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

Wednesday, November 20
12:00PM–3:00PM
Hall A, Oregon Convention Center

GOVERNMENT AGENCY STUDENT POSTER COMPETITION

Poster Setup:	9:00AM–10:00AM
Judging	10:00AM–3:00PM
General Viewing	12:00PM–3:00PM
Awards	By November 27

RESEARCH PODIUM (POSTERS ONLY)

Poster Setup:	9:00AM–10:00AM
Judging:	10:30AM–1:45PM
General Viewing:	12:00PM–2:30PM

PRAYER ROOM

Room E144 on the second floor of the Oregon 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: IMECE2024 CONFERENCE PAPERS AND PROCEEDINGS

Technical papers accepted for publication for IMECE2024 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, Outside of Meeting Rooms A, B, C, D

Monday, November 18	**10:00AM–10:30AM**
Tuesday, November 19	**10:30AM–10:45AM**
Wednesday, November 20	**10:50AM–11:10AM**
Thursday, November 21	**9:45AM–10:05AM**

Afternoon Break, Exhibit Hall A unless otherwise noted

Monday, November 18	**3:25PM–3:45PM**
Tuesday, November 19	**1:30PM–3:00PM**
Wednesday, November 20	**3:45PM–4:05PM**
Thursday, November 21	**3:30PM–3:45PM***

*Outside of Meeting Rooms A, B, C, D

REGISTRATION

Conference registration will be located on the second floor of the Hyatt Regency Portland on Saturday and Sunday. Registration will move to the Hall A lobby on the first floor of the Oregon Convention on Monday. The operating hours are:

Saturday, November 16	**7:00AM–6:00PM, Hyatt Regency Portland**
Sunday, November 17	**7:00AM–5:00PM, Hyatt Regency Portland**
	1:00PM–5:00PM, Oregon Convention Center
Monday, November 18	**7:00AM–6:00PM, Oregon Convention Center**
Tuesday, November 19	**7:00AM–6:00PM, Oregon Convention Center**
Wednesday, November 20	**7:00AM–6:00PM, Oregon Convention Center**
Thursday, November 21	**7:00AM–5:30PM, Oregon Convention Center***

SOCIAL MEDIA

Let's be social! We encourage you to use the hashtag #IMECE2024 to tag your social media posts and photos throughout the conference.

TECHNICAL SESSIONS

All attendees are required to have their badge scanned before entering a technical session. 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

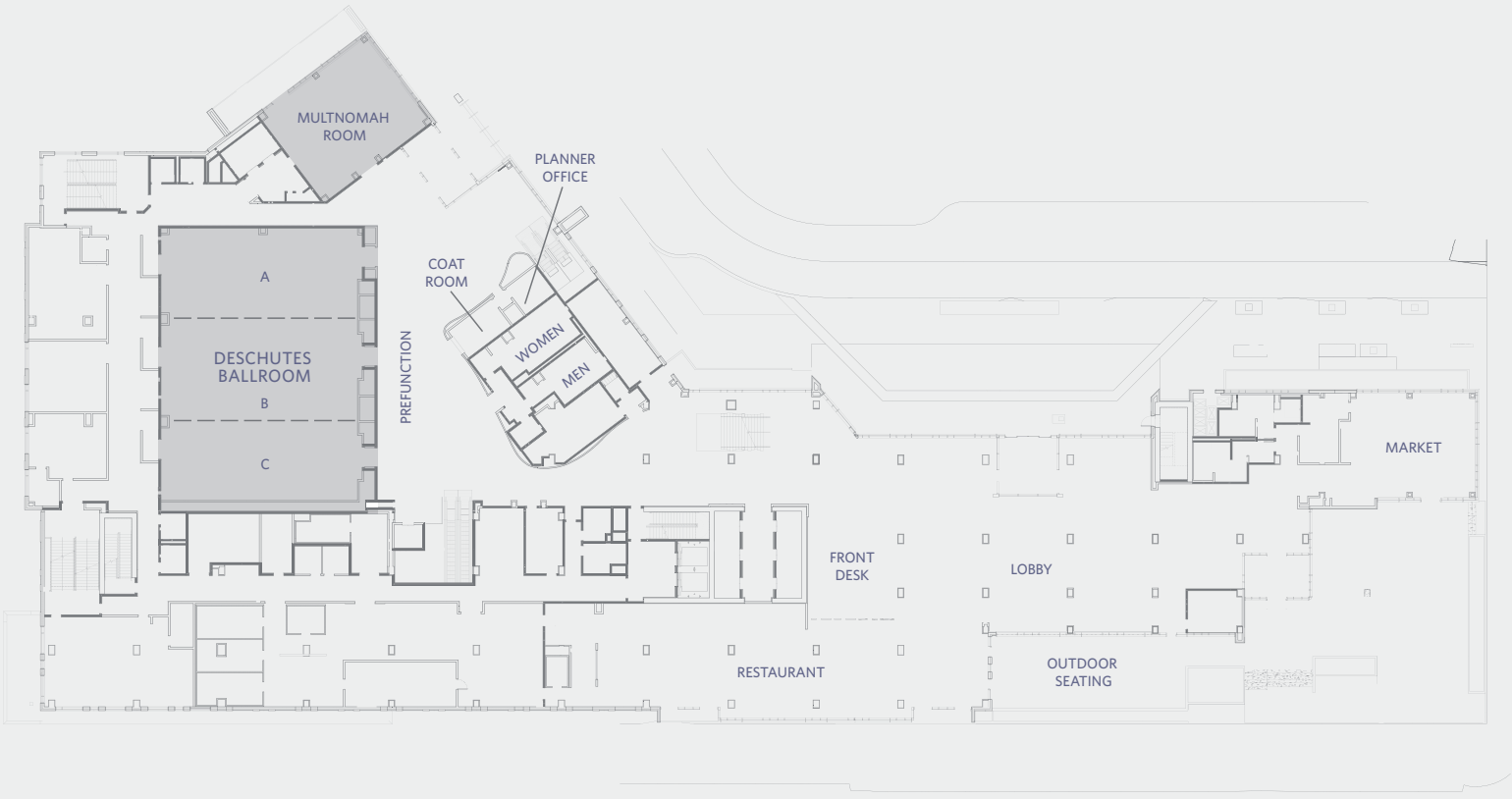
Free Wi-Fi access is provided to IMECE conference attendees throughout the Oregon Convention Center. Free Wi-Fi access is also provided in the hotel rooms at the Hilton Hotel. To access the Wi-Fi in the convention center and the Marriott Hotel use these credentials.

Oregon Convention Center
Network: IMECE
Password: IMECE2024

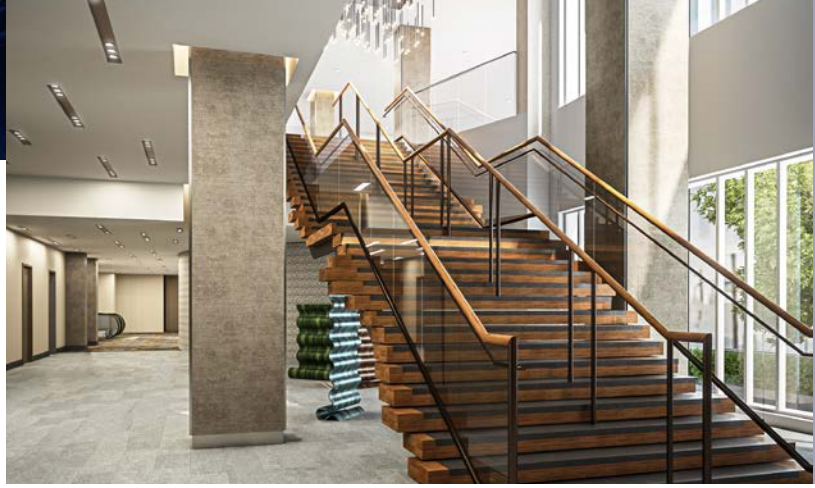
Floor Plans

HYATT REGENCY PORTLAND AT
THE OREGON CONVENTION CENTER
375 NE Holladay St.
Portland, Oregon, 97232 USA
T: +1 971 222 1234
hyattregencyportlandocc.com

FLOOR PLAN
Level One



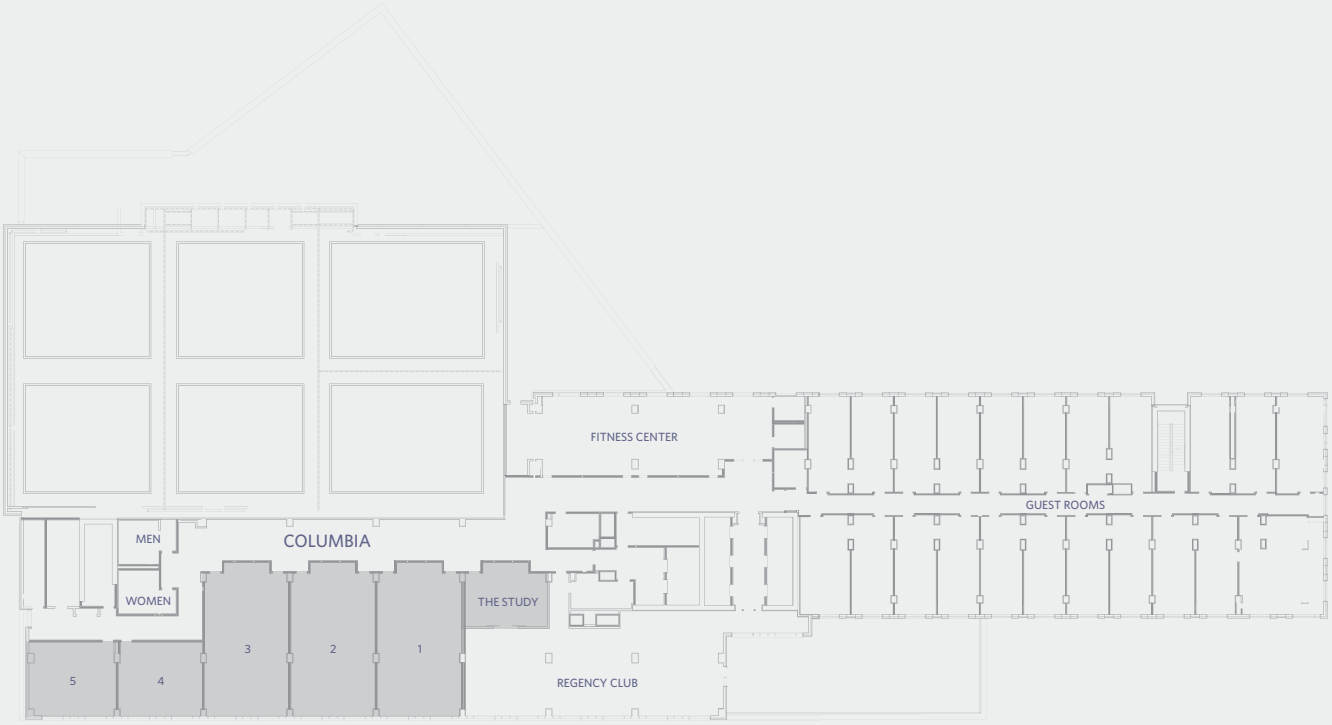
HYATT REGENCY PORTLAND AT
THE OREGON CONVENTION CENTER
375 NE Holladay St.
Portland, Oregon, 97232 USA
T: +1 971 222 1234
hyattregencyportlandocc.com



FLOOR PLAN
Level Two

HYATT REGENCY PORTLAND AT
THE OREGON CONVENTION CENTER
375 NE Holladay St.
Portland, Oregon, 97232 USA
T: +1 971 222 1234
hyattregencyportlandocc.com

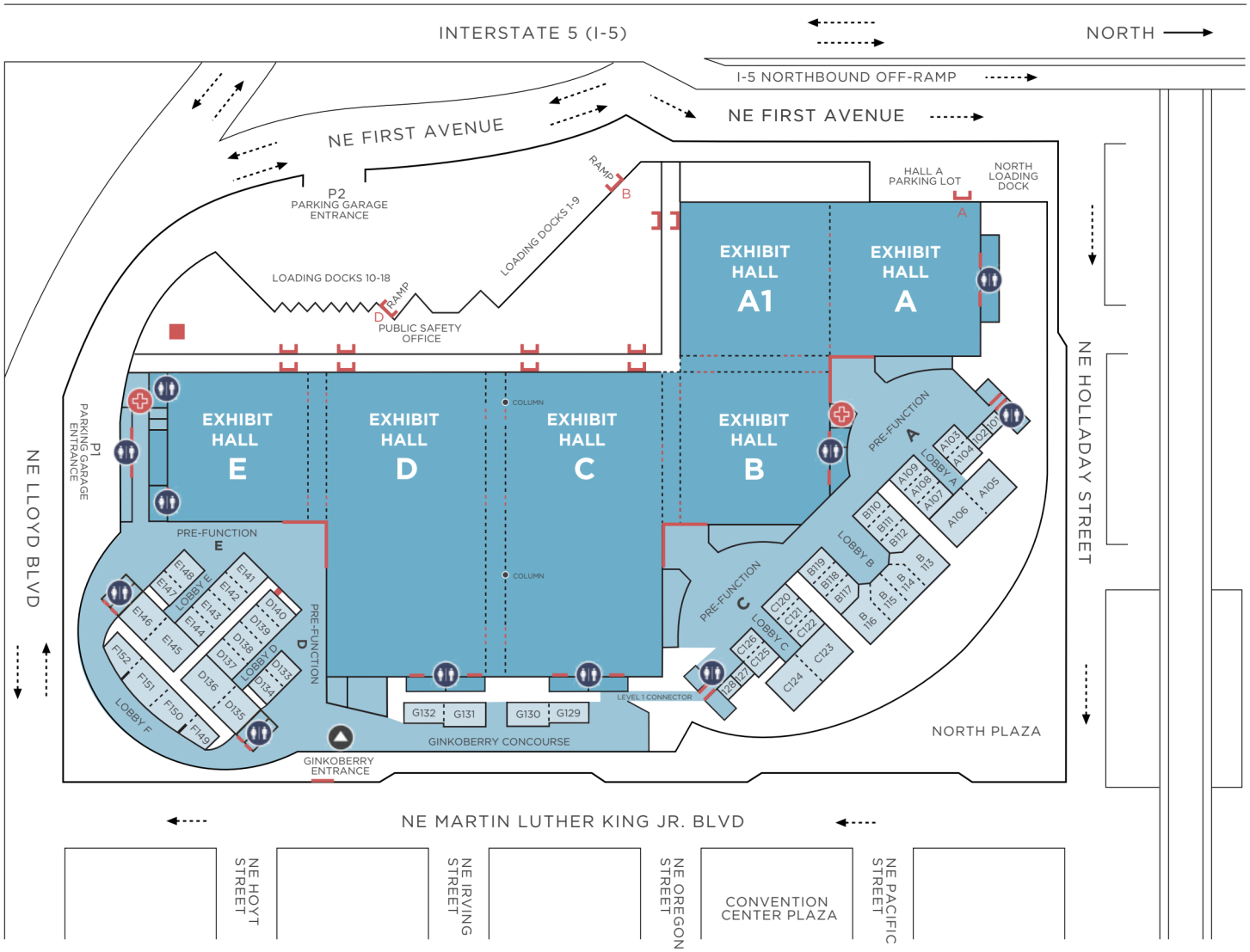
FLOOR PLAN
Level Three



Building Level Maps

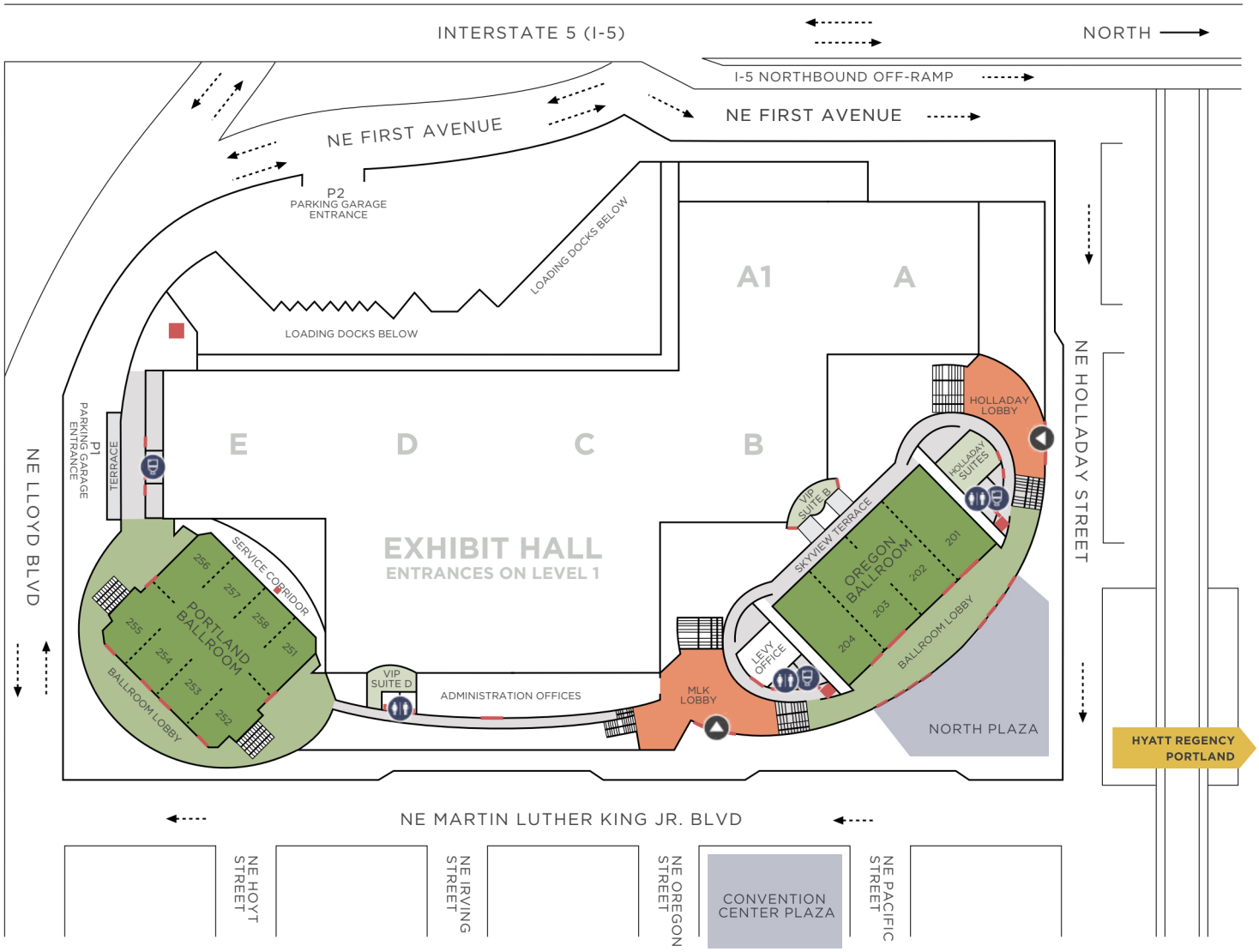
Level 1

EXHIBIT HALLS | PRE-FUNCTION AREAS | A TO G SERIES MEETING ROOMS



ROLL UP DOOR | ENTRANCE INTERIOR | AIR WALL DOORS | FREIGHT ELEVATOR | RESTROOMS | ALL-USER RESTROOMS | FIRST AID | GUEST ENTRANCES

Lobby Level	Level 2			Outdoor Plazas
MLK LOBBY HOLLADAY LOBBY	BALLROOMS	BALLROOM LOBBIES	VIP SUITES	NORTH PLAZA CONVENTION CENTER PLAZA



LOOKING FOR MORE BUILDING AMENITIES?

Additional maps on our website show ATMs, elevators and escalators, loading docks, parking, restaurants, and more.

Visit **oregoncc.org/en/attend/maps** to see what's inside!

TECHNICAL TOURS

All tour buses leave from the front of the oregon convention center on mlk boulevard.

OMIC R&D
Date: Wednesday, November 20, 2024
Time: 9:00AM–11:30AM
SOLD OUT

OMIC R&D is a collaborative innovation center with a mission to help manufacturers grow, advance, and prosper. We conduct applied research to enhance the ability of industry to manufacture products better, faster, greener, and less expensively. We assist industry in developing new ways to make use of existing technology and pave the way for industry to use new and emerging technologies.
By convening those who teach and train existing and future manufacturing employees, we seek to inspire a new generation of learners, enable them to garner competence in industry critical skills and hone and renew the skills of those already engaged in manufacturing so they can engage in new opportunities for themselves and their employers.

ASME LANDMARK

#46 Commonwealth Building Heat Pump

1948

First large commercial building in the United States to pioneer the use of heat pumps for heating and cooling

The use of heat pumps for the heating and cooling of the Commonwealth Building, initiated in 1948, was a pioneering achievement in the western hemisphere. The theoretical conception of the heat pump was described in a neglected book, published in 1824 and written by a young French army officer, Sadi Carnot. Its practical application on a large scale is attributable to designers J. Donald Kroeker and Ray C. Chewning, building engineer Charles E. Graham, and architect Pietro Belluschi.

Following a World War II moratorium on construction of commercial buildings, this unique all aluminum-clad building received the first permit and became a standard style for several decades. Though located in a moderate climate, the building requires air-conditioning because it has no opening windows. Kroeker designed the heating, ventilating, and air-conditioning system with special features that included heat recovery from ventilation exhaust air and use of waste cooling water to heat incoming ventilation air. The 14-story building has separate heating and cooling circuits controlled by thermostat. The basic heat pumps are four condensing units that pump water from two warm wells. Two units use Freon 11 and two use Freon 113.

Important Note: The building was built as the Equitable Building. The name changed in the early 1980's.

Comments from Visitors/Members: 1992 Survey by Carl N. Petterson: General appearance of the heating and cooling system looked good. It is fully functioning. Unfortunately, the building is sound but needs some maintenance. Vacancy rate is too high but the location is good. This building was the first modern curtain-wall building in the United States. Architect Piero Belluschi was an AIA Fellow. It may be an AIA landmark.

NOTE: Survey points out name change from the Equitable Building to Commonwealth Building. This change took place in 1980–82, about the time of the designation ceremony. ASME never changed from the name under which it was nominated, but did recognize by the late 1980s that another building had been built in Portland that is named the Equitable Building. ASME needs to dispel confusion between the two buildings by using the Commonwealth name, the building engineer's name (Graham), or the architect's name (Belluschi).

Landmark Location
Commonwealth Building
421 S.W. 6th Ave., 10th floor
Portland, OR 97205

Visiting Info
Regular hours and by appointment, 8:00AM–5:00PM weekdays.

Share your photos of these engineering marvels with the hashtag #ASMELandmarks.

COMMONWEALTH (EQUITABLE) BUILDING

Special Events

SUNDAY, NOVEMBER 17
ELEVATEME DINING ETIQUETTE
12:30PM-2:30PM

ElevateMe

Kick off your ElevateME experience with IMECE's Dining Etiquette session, where you'll master the art of professional dining. This interactive session offers essential tips on proper table manners, conversation skills, and navigating formal dining settings—empowering you to make a lasting impression in both professional and social settings.
*Pre-registration required

FIRST-TIME ATTENDEE ORIENTATION
2:00PM–3:00PM
ROOM C123, CONVENTION CENTER

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
4:00PM-5:30PM
ROOM C123, 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

MONDAY, NOVEMBER 18
OPENING KEYNOTE EVENT
8:00AM–9:00AM
(BREAKFAST SERVED FROM 7:30AM TO 8:00AM)
OREGON BALLROOM, CONVENTION CENTER

Keynote Speaker:
Evelyn Wang, Ph.D.
Director
Advanced Research Products Agency-Energy (ARPA-E)

Keynote Title: Forging a Disruptive Global Energy System: A Vision for a Sustainable Future

Abstract: The realization of a net-zero world by 2050 requires a global energy revolution that must be completed within a generation. The energy grid of the future should deliver power reliably, on demand, and at a pace that meets the world's rising needs, all while significantly reducing our dependence on fossil fuels. In this talk, Dr. Wang will share a vision of our energy future that requires disruptive technologies to create an energy landscape that is dramatically different from the one we know today. Three goals are essential to this vision:

- Abundant greenhouse gas (GHG)-free primary energy
- An intermodal energy superhighway that accommodates diversified forms of GHG-free primary energy
- An abundant and renewable carbon transition that addresses projected demand for polymers and other carbon-based materials

Taken together, these goals offer a glimpse into a novel and robust global energy system that exceeds the needs of future generations while respecting the planetary environment we depend on. Dr. Wang will discuss examples of promising technology areas and advancements that align with this vision. Meeting these goals by 2050, however, necessitates significant development and deployment of disruptive energy technologies at an unparalleled speed and scale.

Biography: Dr. Evelyn N. Wang currently serves as the Director at the Advanced Research Projects Agency-Energy (ARPA-E), where she leads the Agency's development, launch, and execution of high-risk, high-reward energy research and development programs.
Prior to joining ARPA-E, Dr. Wang served as the Ford Professor of Engineering and Head of the Department of Mechanical Engineering at Massachusetts Institute of Technology (MIT). During her time at MIT, she focused on thermal management, thermal energy conversion and storage, and water harvesting and purification.

Dr. Wang was previously the Associate Director of the MIT Solid-State Solar-Thermal Energy Conversion Center, a DOE Energy Frontiers Research Center. Earlier in her career, Dr. Wang worked as a postdoctoral researcher at Bell Laboratories, Alcatel-Lucent and as a consultant for the

Defense Science Study Group, where she advocated for collaboration between academia and national defense to solve issues of national security.

Dr. Wang holds a Ph.D. in Mechanical Engineering from Stanford University. She also received an M.S. in Mechanical Engineering from Stanford University and a B.S. in Mechanical Engineering from MIT. She is a Fellow of the American Society of Mechanical Engineers, American Association for the Advancement of Science, and the American Academy of Arts and Sciences.

Sponsored By:

UNIVERSITY OF WISCONSIN PLATTEVILLE Online

MONDAY, NOVEMBER 18
PANEL ON CMMI RESEARCH OPPORTUNITIES
1:40PM–3:25PM
ROOM D137, CONVENTION CENTER

NSF (National Science Foundation) CMMI Representatives from CMMI will introduce new funding opportunities and current NSF opportunities from their respective divisions and have a live Q&A with the audience about the opportunities. These presentations will be of greatest benefit to current faculty members (all ranks) at U.S. Institutions.

FUNDAMENTALS OF ENGINEERING/SOFT SKILLS SESSION
2:30PM-3:30PM
ROOM D138, CONVENTION CENTER

ElevateMe

Sharpen your professional toolkit with valuable insights into essential soft skills crucial for success in the field of mechanical engineering.

Exhibit Hall Grand Opening and Opening Reception
5:30PM–7:00PM
Hall A, 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
HALL A, 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 GRAND CENTRAL BOWL & ARCADE
7:30PM-10:00PM

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.
*Pre-registration required.

TUESDAY, NOVEMBER 19
KEYNOTE LECTURE AND 2024 ASME SOCIETY AWARDS
8:00AM–9:30AM
(BREAKFAST SERVED FROM 7:30AM TO 8:00AM)
OREGON BALLROOM, CONVENTION CENTER

Keynote Speaker:
M. Stanley Whittingham FRS, Ph.D.
Nobel Prize in Chemistry, 2019 Recipient
Distinguished Professor of Chemistry, Founding Director
NECCES and Chemistry Department
Binghamton University, SUNY
ASME 2024 Richard J. Goldstein Energy Lecture Award Recipient

Keynote Title: Li Batteries: 50 Years Old and the Future Challenges for an American Based Industry

Abstract: The Nobel Committee citation read: "They have laid the foundation of a wireless, fossil fuel-free society, and are of the greatest benefit to humankind." Now the world needs to take action. Although lithium batteries celebrated their 50th anniversary in 2022, they still achieve only 25% of their theoretical energy density. Even at that level, they now dominate portable energy storage. The dominant anode and cathode today are graphitic carbon and the layered NMC oxides, LI[NiMnCoAl]O2. Both need improving. We must push the chemistry to its limits. Ten-year lifetimes demand 99.95% reaction selectivity. Alternatives to Li-NMC cells will also be discussed, including the phosphates, with also a discussion of what is very technically and/or politically challenging and maybe not viable in an attempt to correct some of the exponential hype in the battery energy storage arena. A key challenge in the Western world is to build a sustainable supply chain and manufacturing capability that leapfrogs the present 30-year old technology. We need to stop building new "old gigafactories" in North America.

Biography: Stan Whittingham is a Distinguished Professor of Chemistry and Materials Science and Engineering at Binghamton University. Dr. Whittingham was named a Knight Bachelor "for his Services to Research in Chemistry" as part of King Charles' June 2024 official birthday honours list. This honor entitled him to be known as Sir Stanley or Sir Stanley Whittingham. He was the 2019 Chemistry Nobel Laureate for the discovery of lithium rechargeable batteries, and the 2023 VinFutures $3M Grand Prize winner. He is a member of the National Academy of Engineering and Fellow of The Royal Society. He presently leads the Battery-NY $113M economic development effort, and is the Chief Innovation Officer of the recently awarded NSF Upstate New York Energy Storage Engine. He is a founding member of NYBEST, and serves on the Board as Vice-Chair for Research, and Chief Scientific Officer of NAATBatt.

2024 ASME SOCIETY AWARDS
ASME MEDAL

Adrian Bejan, Ph.D., earned his B.S., M.S., and Ph.D. from Massachusetts Institute of Technology. Dr. Bejan received his postdoctoral fellow at Miller Institute for Basic Research in Science, U. California Berkeley; and is J.A. Jones Distinguished Professor Duke University since 1989. Prestigious Honors include Benjamin Franklin Medal, Humboldt Research Award; 18 honorary doctorates from 11 countries; author of more than 30 books and 700 peer-reviewed journal articles, and frequently sole author. Dr. Bejan built permanent bridges between fields thought to be "disconnected":

- Unified thermodynamics with heat transfer, fluid dynamics, and science of form (flow configuration, image, design), as a counterweight to the doctrine of reductionism, cf., Entropy Generation through Heat and Fluid Flow, 1982.
- Unified the sciences with EVOLUTION as physics, throughout nature. He discovered, taught, and applied the "Constructal Law" of evolution in NATURE—animate and inanimate, human-made, and not human-made, cf., Shape and Structure, from Engineering to Nature, 2000.
- Unified biologists, physicists, engineers, sociologists, philosophers, economists, managers, and athletes with creative books for the public: Design in Nature (2012), The Physics of Life (2016), Freedom and Evolution (2020), Time and Beauty (2022), and 14 Constructal Law Conferences worldwide.

Dr. Bejan's 2021 author WORLD impact rankings: among top 0.01% of the most cited and impactful world scientists, #6 in Mechanical Engineering worldwide, and #11 in all Engineering disciplines, worldwide.

HONORARY MEMBERS

Marco Amabili, Ph.D., earned his Ph.D. from the University of Bologna. He is a Chair professor in the School of Engineering at Westlake University, Hangzhou, China. Dr. Amabili is an Emeritus Distinguished James McGill professor at McGill University, Montreal, Canada. He is an International Member of the National Academy of Engineering of the USA, an elected Fellow of the Royal Society of Canada (Academy of Sciences) and the Canadian Academy of Engineering. He is also member of Academia Europaea, European Academy of Sciences and Arts, European Academy of Sciences and Fellow of the Engineering Institute of Canada. In 2008, Dr. Amabili wrote the monograph "Nonlinear Vibrations and Stability of Shells and Plates," published by Cambridge University Press. For this influential book, he received the Worcester Reed Warner Medal of the ASME in 2020. Dr. Amabili received the 2022 Guggenheim Fellowship

in Engineering, the 2021 Mindlin medal of the American Society of Civil Engineers, the 2021 Gili-Agostinelli International prize of the "Lincei" National Academy of Sciences of Italy, the 2022 Blaise Pascal medal of the European Academy of Sciences, and the 2022 Rayleigh Lecture Award of the ASME. Dr. Amabili just completed his term as the Chair of the Executive Committee of Applied Mechanics Division of the ASME. He contributed in different roles to the organization of IMECE for the last 24 years.

Subir Chowdhury earned his B. Tech (Honors) in Aeronautical Engineering from the Indian Institute of Technology in Kharagpur, India and his M.A. in Industrial Management from Central Michigan University. Subir has been Chairman and CEO of ASI Consulting Group, LLC 2003 to present; from 1997 to 2003, he was Executive Vice President at the American Supplier Institute, Inc., and from 1993 to 1997, Subir was Quality Engineering Consultant at Delphi Automotive Systems. Since 2007 to present, Subir established the first school of Quality and Reliability in the Indian Institute of Technology, Kharagpur, India; the first Center for Bangladesh Studies in USA at the University of California, Berkeley; Graduate Fellowships on Quality and Economics at the Harvard University and London School of Economics; and a Prize at the University of Southern California. Re Non-Profit, since 2007, Subir has been the Founder and Director of the Subir and Malini Chowdhury Foundation; and from 1996 to 1997, he was the Chairman of the American Society for Quality, Automotive Division. Subir received several recognitions: Doctor of Engineering (Honoris Causa), from Michigan Technological University; Doctor of Commercial Science (Honoris Causa), Central Michigan University; and Doctor of Law (Honoris Causa), University of Western Ontario, Canada.

Michael Khonsari, Ph.D., earned his B.S., M.S., and Ph.D. in Mechanical Engineering at The University of Texas at Austin. He holds the Dow Chemical Endowed Chair at LSU and concurrently serves as Associate Commissioner for Research at the Louisiana Board of Regents. Before joining LSU, Dr. Khonsari was a faculty member at Ohio State University, University of Pittsburgh, and Southern Illinois University. Concurrently, he served as a faculty research fellow at NASA Glenn (formerly Lewis) Research Center in Cleveland, the Department of Energy in Pittsburgh, and Wright-Patterson Air Force (Dayton). Dr. Khonsari is the director of the NSF Center for Innovations in Structural Integrity Assurance (CISIA). He was the Editor-in-Chief of ASME Journal of Tribology from 2012 to 2022. He currently serves on the editorial board of 10 scientific journals and is the Field Chief Editor of Frontiers in Mechanical Engineering. Dr. Khonsari is a Fellow of AAAS, NAI, ASME, and STLE. He has mentored nearly 100 postdocs, Ph.D. and MS graduates, and visiting scholars and authored over 450 archival publications, 3 technical books, and 15 articles in encyclopedias. He is also a recipient of numerous awards and honors, including ASME Mayo Hersey, ASME Burt NewKirk, and NLGI Clarence E. Earle Memorial awards.

Zhuomin Zhang, Ph.D., currently holds the J. Erskine Love, Jr. Professor in George W. Woodruff School of Mechanical Engineering at Georgia Institute of Technology. He earned his B.S. and M.S. degrees from University of Science and Technology of China and Ph.D. degree from MIT. Dr. Zhang worked at National Institute of Standards and Technology and University of Florida before joining Georgia Tech in 2002. He has made important contributions to the theory and measurements of spectral radiative properties of solids and thin films, micro/nanostructures including photonic crystals, gratings, carbon nanotube arrays, metamaterials, two-dimensional electronic and phononic materials, etc. He has co-authored over 240 journal papers and book chapters. Dr. Zhang has given more than 400 keynotes, invited talks, and contributed presentations at international conferences and seminars at many universities around the world. Dr. Zhang is the author of Nano/Microscale Heat Transfer (1st ed. 2007; 2nd ed. 2020), which has been adopted by many universities worldwide and translated into Chinese in 2016. He has supervised over 70 Ph.D. and M.S. students, visiting scholars, postdoctoral fellows, and undergraduate researchers. Many of his former students and mentees have established successful careers at major universities and industries in the United States and other countries.

Jean Zu, Ph.D., earned her B.Sc and M.Sc. from Tsinghua University in China and a Ph.D. from the University of Manitoba, Canada. Dr. Zu joined the Department of Mechanical & Industrial Engineering at the University of Toronto as an Assistant Professor in January 1994. She was promoted to Associate Professor in 1999 and to Professor in 2004. She served as Associate Chair for Research and as Chair of the department from July 2009 to April 2017. Since May 1, 2017, she has served as the Lore E. Feiler Dean of Schaefer School of Engineering and Science at Stevens Institute of Technology, overseeing the largest school of the university with a total annual budget of $65 million, over 50 undergraduate and graduate programs, 200 faculty, and over 5,000 students.

Dr. Zu's research is focused on mechanical vibrations and energy harvesting. She has successfully collaborated with several companies on research projects with focus on automotive applications. She raised $5 million in research funding, primarily as PI, with 40 grants and sponsored programs. Dr. Zu has published 340 papers including 180 journal papers and obtained five patents, and she has advised 36 Ph.D. students in her academic career. She is a Fellow of CAE, ASME, EIC, CSME, and AAAS. She served as President of Canadian Society for Mechanical Engineering in 2006–2008, as a member on NSERC Grant Selection Committee in 2004–2007, and as the Associate Editor of ASME Journal of Vibration and Acoustics in 2007–2013. Dr. Zu also served as the President of Engineering Institute of Canada (EIC) in 2012–2014. She received numerous awards and was recognized in 2019 as one of the Notable Women in Technology by Crain's New York Business.

RICHARD J. GOLDSTEIN ENERGY LECTURE AWARD

M. Stanley Whittingham FRS, Ph.D., is a Distinguished Professor of Chemistry and Materials Science and Engineering at Binghamton University. He was the 2019 Chemistry Nobel Laureate for the discovery of lithium rechargeable batteries, and the 2023 VinFutures $3M Grand Prize winner. He is a member of the National Academy of Engineering and Fellow of The Royal Society. He presently leads the Battery-NY $113M economic development effort and is the Chief Innovation Officer of the recently awarded NSF Upstate New York Energy Storage Engine. He is a founding member of NYBEST and serves on the Board as Vice-Chair for Research, and Chief Scientific Officer of NAATBatt.

TUESDAY, NOVEMBER 19
10:45AM–12:15PM
CONVENTION CENTER, ROOM D138

Proposal Writing Workshop

In this workshop, the fundamentals of grant proposal writing for the National Science Foundation (NSF) will be covered. 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 toward 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.

TUESDAY, NOVEMBER 19
10:45 AM-11:45 AM
ROOM C123, CONVENTION CENTER

ElevateMe

INDUSTRY

Panel: "I Code Like a Girl": Adding the U to #Uniquecareerpaths!

Are you curious about exploring alternative career paths in tech but unsure where to begin? Do you want to leverage your transferable skills to pivot into a career that aligns with your passions and values? Join us for an inspiring panel discussion featuring individuals who have forged their own paths in data and AI. Hear their unique stories of bringing their whole selves to their careers as women of color, mothers, and immigrants. Learn how they navigated challenges like visa issues, layoffs, and imposter syndrome to achieve success in emerging tech. Gain practical advice and inspiration to unlock your full potential and emerge energized for your next career adventure.

Through their experiences, you'll learn how to:

- Strategize a personalized action plan: Discover how to create a tailored plan that leverages your unique identity, strengths, and weaknesses to advance your career. Learn how to set achievable goals, identify opportunities for growth, and develop a roadmap for success.
- Highlight transferable skills: Understand how to showcase your transferable skills, such as problem-solving, communication, and leadership, to make your resume and career profile stand out to recruiters and hiring managers. Learn how to articulate your value proposition and demonstrate your versatility.
- Leverage resources: Learn how to utilize resources to stretch, learn, and develop new skills, build a network, and cultivate a growth mindset. Discover how to access mentorship, training, and community support to help you navigate challenges and achieve your goals.

Our panelists will share their stories of:

- Teaching themselves to code: Hear how our panelists learned to code, overcame obstacles, and built confidence in their technical abilities. Learn from their experiences and gain insights into the resources and support that helped them succeed.
- Building confidence in negotiation: Discover how our panelists developed the skills and confidence to negotiate effectively, whether it's for a new role, a raise, or a promotion. Learn how to advocate for yourself and your worth.
- Pivoting to AI roles: Learn from our panelists' experiences of transitioning to new roles, navigating challenges like visa issues or layoffs, and finding opportunities for growth. Gain insights into the strategies and mindset shifts that helped them succeed.
- Celebrating failure and learning from mistakes: Hear how our panelists embraced failure as a learning opportunity, reframed setbacks as stepping stones, and developed resilience in the face of challenges. Learn how to cultivate a growth mindset and bounce back from adversity.

Join us to unlock your full potential and discover how to:

- Embrace your unique strengths and experiences to stand out in the tech industry
- Build a supportive network and community to help you navigate challenges and celebrate successes
- Develop a growth mindset and resilience to thrive in emerging tech

Don't miss this opportunity to hear from women who have paved their own paths in tech and learn how to do the same!!

Columbia Mishra
Global Space Industry Trade Association
MODERATOR

Parisa Saboori
Manhattan College, Co-Moderator

Vinija Jain
PANELIST

Zahra Shahbazi
Manhattan University
PANELIST

Aditi Roy
e Smart Machine Vision Group at Siemens Technology
PANELIST

Sreyoshi Bhaduri
Amazon
PANELIST

LAUNCH YOUR CAREER: TRANSITIONING FROM ACADEMIA TO INDUSTRY

TUESDAY, NOVEMBER 19
3:00 PM-4:00 PM
CONVENTION CENTER, ROOM C123

ElevateMe

INDUSTRY

Stepping into your first job after school is a big transition. This dynamic panel is here to supercharge your journey, offering students, early career engineers, and anyone eager to navigate the professional world, with actionable advice and insider tips on making the leap from academia to industry.

What you will hear about:

- Market Your Skills: Learn how to showcase your research talents in the corporate arena.
- Network Like a Pro: Build connections that will propel your career forward.
- Ace the Interview: Get expert advice on interviewing and negotiating.
- Seamless Transition: Master the shift from academic life to the bustling industry environment.

Meet the Experts: Our panel has seasoned industry professionals with graduate experience, hailing from large corporations, innovative start-ups, and prestigious national labs. They're ready to share their personal stories, hard-earned lessons, and practical tips from their career journeys.

Who Should Attend? This panel is perfect for students, early career engineers, and anyone curious about transitioning from graduate school to the corporate world.

Enakshi Wikramanayake
Axiom Space
MODERATOR

Columbia Mishra
Ferrotec USA
PANELIST

Ruander Cardenas
Intel Corporation
PANELIST

John Tencer
Sandia National Laboratories
PANELIST

Navkiran Pandher
Intel Corporation
PANELIST

FRANK KREITH ENERGY AWARD
ADVANCED ENERGY SYSTEMS – LECTURE & RECEPTION
TUESDAY, NOVEMBER 19
5:00PM–7:00PM
HYATT REGENCY PORTLAND – DESCHUTES BALLROOM A, LEVEL 1

S. A. Sherif, Ph.D.
University of Florida

For significant contributions to research in thermodynamic and heat transfer analysis and optimization of a wide variety of energy systems

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, an Associate Fellow of AIAA, and a Member of the Board of Directors of the International Association for Hydrogen Energy. He is the 2013–2014 Chair of the ASME Heat Transfer Division and the 2002–2003 Chair of the ASME Advanced Energy Systems Division. He currently serves as Editor-in-Chief of the ASME Journal of Solar Energy Engineering. He served as Editor-in-Chief of the ASME Journal of Thermal Science and Engineering Applications (2014–2019). He is on the editorial boards of 25 other archival journals. He has 350 papers, one book, 24 book chapters, 240 technical reports, and two U.S. patents.

EDWARD F. OBERT AWARD
ADVANCED ENERGY SYSTEMS – LECTURE & RECEPTION
TUESDAY, NOVEMBER 19
5:00PM–7:00PM
HYATT REGENCY PORTLAND – DESCHUTES BALLROOM A, LEVEL 1

Marian Bulla
Altair, Inc.

Marian Bulla, born on March 2, 1971, in Germany, is an accomplished engineer specializing in simulation, material data, and product safety. He is the Director of the OpenRadioss Community at ALTAIR, where he has been a key contributor since 2008. His career began with vocational training as an industrial mechanic, followed by military service and engineering studies at the University of Iserlohn. Bulla has worked in various roles in the automotive and engineering sectors, focusing on testing and simulation. He is actively involved in research projects, particularly in materials science, and has been an Associated Professor at FH Aachen University of Applied Sciences since 2005. With over two decades of experience, Bulla is recognized for his contributions to safety engineering and material research, as well as his leadership in advancing technology through research and collaboration.

Stefan Kolling, Ph.D.
Technische Hochschule Mittelhessen

Stefan Kolling is a professor of mechanics at THM University of Applied Sciences in Giessen, Germany, specializing in crash simulation and material modeling. He earned his diploma in civil engineering in 1996 and another diploma in mechanics in 1998, followed by a Ph.D. in solid mechanics from the Technical University of Darmstadt in 2001. After working as a development engineer at Daimler from 2002 to 2008, focusing on crash simulation, Kolling became a professor at THM. His research has been widely recognized, earning him the 2017 Research Prize from Hessian Universities, and his work has garnered over 2,800 citations. Kolling is active in professional organizations such as GAMM, IAPS, and DGM, and has presented at international conferences like IMECE 2023.

Elham Sahraei, Ph.D.
Temple University

Elham Sahraei is an Associate Professor in the Department of Mechanical Engineering. She is the director of the Electric Vehicle Safety Lab (EVSL). Her research is focused on mechanical safety of lithium-ion batteries under extreme loading conditions. Her recent work has been sponsored by the automotive industry, FE software companies, state programs and Office of Naval Research. Prior to Temple, Dr. Sahraei was a Research Scientist at the Impact and Crashworthiness Lab of Massachusetts Institute of Technology and the co-director of the MIT Battery Consortium, a multi-sponsor industrial program supported by major automotive and battery manufacturers. She earned her Ph.D. degree from the George Washington University, her Master's from Sharif University of Technology, and her BSc from Isfahan University of Technology. Besides characterization and modeling of Li-Ion batteries, her expertise includes full-scale vehicle crash analysis, occupant protection, and analysis of roadside safety structures.

For the paper titled, "An Experimental and Computational Study of Mechanically and Dynamically High Loaded Separators for Lithium-Ion Batteries"

ZDENĚK P. BAŽANT MEDAL
APPLIED MECHANICS DIVISION AWARDS DINNER
TUESDAY, NOVEMBER 19
6:30PM–9:00PM
HYATT REGENCY PORTLAND – DESCHUTES BALLROOM BC, LEVEL 1

Yong Zhu, Ph.D.
North Carolina State University

For significant contributions to the field of nanomechanics through the development and application of novel, innovative instrumentation to discover new deformation mechanisms and understand their mechanistic origins, leading to advances in the mechanics of nanomaterials for both soft electronics and soft robotics

TIMOSHENKO MEDAL
APPLIED MECHANICS DIVISION AWARDS DINNER
TUESDAY, NOVEMBER 19
6:30PM–9:00PM – LECTURE AND AWARDS PRESENTATION
HYATT REGENCY PORTLAND- DESCHUTES BALLROOM BC, LEVEL 1

Pierre M. Suquet, Ph.D.
National de la Recherche Scientifique

For pioneering contributions in the development of homogenization methods for composite materials

DANIEL C. DRUCKER MEDAL
APPLIED MECHANICS DIVISION AWARDS DINNER
TUESDAY, NOVEMBER 19, 2024
6:30PM–9:00PM
HYATT REGENCY PORTLAND – DESCHUTES BALLROOM BC, LEVEL 1

Pradeep Sharma, Ph.D.
University of Houston

For pioneering contributions to the foundation of solid mechanics and its connection with statistical mechanics, electricity, and magnetism.

WARNER T. KOITER MEDAL
APPLIED MECHANICS DIVISION AWARDS DINNER
TUESDAY, NOVEMBER 19, 2024
6:30PM–9:00PM
HYATT REGENCY PORTLAND- DESCHUTES BALLROOM BC, LEVEL 1

H. Jerry Qi, Ph.D
Georgia Institute of Technology

For significant contributions to nonlinear mechanics and the multiphysics behavior of active polymers through experimentation and theoretical modeling, and for pioneering work in the emerging field of 4D printing

THOMAS K. CAUGHEY DYNAMICS MEDAL

*Medal will not be presented at IMECE. ASME would like to congratulate Friedrick Pfeiffer, Ph.D.

Friedrich Pfeiffer, Ph.D.
Technische Universität Munchen

For significant contributions to the research, education, and practice of nonlinear dynamics, resulting in significant advancements in the modeling, analysis, simulation, design, and manufacture of robotics, aerospace systems, and mechanical and fluid power transmissions

GUSTUS L. LARSON MEMORIAL AWARD
APPLIED MECHANICS DIVISION AWARDS DINNER
TUESDAY, NOVEMBER 19, 2024
6:30PM–9:00PM
HYATT REGENCY PORTLAND- DESCHUTES BALLROOM BC, LEVEL 1

Sinan Keten, Ph.D.
Northwestern University

For outstanding achievements in mechanical engineering within 10 to 20 years following graduation

PI TAU SIGMA GOLD MEDAL
APPLIED MECHANICS DIVISION AWARDS DINNER
TUESDAY, NOVEMBER 19
6:30PM–9:00PM
HYATT REGENCY PORTLAND- DESCHUTES BALLROOM BC, LEVEL 1

Raudel Avila, Ph.D.
Rice University

For outstanding achievements in mechanical engineering within ten years of graduation

CHARLES RUSS RICHARDS MEMORIAL AWARD
APPLIED MECHANICS DIVISION AWARDS DINNER|
TUESDAY, NOVEMBER 19
6:30PM–9:00PM
HYATT REGENCY PORTLAND- DESCHUTES BALLROOM BC, LEVEL 1

Narayana R. Aluru, Ph.D.
University of Texas at Austin

For outstanding achievements in mechanical engineering for 20 years or more following graduation

ARTIFICIAL INTELLIGENCE IMPLEMENTATION AND CHALLENGES IN INDUSTRY
WEDNESDAY, NOVEMBER 20
9:05 AM-9:50 AM
CONVENTION CENTER, ROOM C123

The emergence and growth of Artificial Intelligence (AI) in research and industrial implementation has 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?

Meet the Experts: Our panel includes Industry experts from large corporations to small and medium manufacturers and government agency members.

Who Should Attend? This panel is mainly for industry professionals, academic experts, and students interested in AI methodologies and techniques.

Sekhar Rakurty
The M. K. Morse Company
MODERATOR

Barry Humphrey
Defense Logistics Agency
PANELIST

Aditi Roy
e Smart Machine Vision Group at Siemens Technology
PANELIST

Patrick Barrett
Manufacturing X Digital (MxD)
PANELIST

WEDNESDAY
NOISE CONTROL AND ACOUSTICS DIVISION: RAYLEIGH LECTURE
WEDNESDAY, NOVEMBER 20
11:10AM–12:10PM
OREGON CONVENTION CENTER, B114

Weidong Zhu
University of Maryland

Title: Dynamics of Time-Varying, Nonlinear, and Flexible Multibody Systems with Industrial Applications

Starting from Lord Rayleigh's pioneering contributions in sound and vibration such as the Rayleigh's quotient and parametric oscillation, this lecture presents some new methodologies for analyzing and integrating the dynamics of time-varying systems, nonlinear systems, continuous systems, and flexible multibody systems, as well as nonlinear wave propagation. Two types of dynamic stability problems are addressed from the energy viewpoint in the first area: dynamic stability of translating media during extension and retraction, and parametric instabilities in second-order continuous systems with periodically varying lengths and/or velocities. The incremental harmonic balance method is used in the second area to handle periodic responses of high-dimensional models of nonlinear continuous systems and their stability and bifurcations, as well as quasi-periodic responses. New spatial discretization methods in the third area ensures that all boundary conditions of continuous systems are satisfied, and hence uniform convergence of solutions. New nonlinear models of slack cables with large deformations are developed for moving elevator traveling cables and plants under unsteady flows in the fourth area. Nonlinear wave solutions and their stability and bifurcations are studied in the fifth area. Some interesting results in these areas are revealed. Applications of the new methodologies to high-speed elevators, rotating wind turbine blades, automotive timing belts, tensegrity structures, and phononic structures are discussed. Some experimental results are presented to validate theoretical predictions.

Biography: Weidong Zhu is a Professor in the Department of Mechanical Engineering at the University of Maryland, Baltimore County, and the founder and director of its Dynamic Systems and Vibrations Laboratory and Laser Vibrometry and Optical Measurement Laboratory. He received his double major B.S. degree in Mechanical Engineering and Computational Science from Shanghai Jiao Tong University in 1986, and his M.S. and Ph.D. degrees in Mechanical Engineering from Arizona State University and the University of California at Berkeley in 1988 and 1994, respectively. He is a recipient of the 2004 National Science Foundation CAREER Award. He has been an ASME Fellow since 2010 and has served as an Associate Editor of the ASME Journal of Vibration and Acoustics and the ASME Journal of Dynamic Systems, Measurement and Control, as a Subject Editor of the Journal of Sound and Vibration, and as a Topical Associate Editor of Nonlinear Dynamics. His research spans the fields of dynamics, vibration, control, structural health monitoring, metamaterials, and renewable energy, and involves analytical development, numerical simulation, experimental validation, and industrial application. He has published 340 archival journal papers in these fields and has ten issued U.S. patents. He is a recipient of the 2020 University System of Maryland Board of Regents Faculty Award for Excellence in Research and the 2024 ASME Rayleigh Lecture Award.

PANEL ON CBET RESEARCH OPPORTUNITIES
WEDNESDAY, NOVEMBER 20
11:10AM–12:10PM
ROOM C123, CONVENTION CENTER

NSF (National Science Foundation) CMMI Representatives from CMMI will introduce new funding opportunities and current NSF opportunities from their respective divisions and have a live Q&A with the audience about the opportunities. These presentations will be of greatest benefit to current faculty members (all ranks) at U.S. Institutions.

FUTURE MANUFACTURING
WEDNESDAY, NOVEMBER 20
11:10AM–12:10PM
ROOM A105, CONVENTION CENTER

Sponsored by the Advanced Manufacturing Track
Future manufacturing holds the promise of increased efficiency, flexibility, sustainability, and innovation, driving economic growth and competitiveness in the global marketplace. Future manufacturing is set to be transformed by a convergence of technologies and trends, shaping the way products are produced, distributed, and consumed. Future manufacturing is intrinsically multidisciplinary, spanning across various fields such as engineering, materials science, and computer science. This panel will provide a forum for exchange of fundamental research, education, and workforce development activities in addition to a discussion of future trends in manufacturing with a focus on new manufacturing capabilities that do not exist today. In this panel, Dr. Andrew Wells, the director of the NSF's Future Manufacturing (FM) program along with some awardees of the program are invited to clarify the requirements of future manufacturing and discuss potential transformative research and educational activities that support the future of manufacturing.
Particularly, this panel aims:

- To distinguish Future Manufacturing from Advanced Manufacturing (in terms of how projects and proposals are different)
- To highlight Future Manufacturing successes (with a focus on impactful and off-the-wall projects)
- To discuss possible areas ripe for exploration in Future Manufacturing proposals, likely with reference to the Blue-Sky competition.

Roozbeh "Ross" Salary
Associate Professor of Mechanical and Biomedical Engineering
College of Engineering & Computer Sciences
Marshall University (West Virginia State)
MODERATOR

Andrew Wells
Program Director
National Science Foundation
Advanced Manufacturing (AM) and Future Manufacturing (FM) Programs
INVITED SPEAKER

Satyandra K. (SK) Gupta
Smith International Professor of Mechanical Engineering and Computer Science
Director, Center for Advanced Manufacturing
Viterbi School of Engineering
University of Southern California
INVITED SPEAKER

Scott Thompson
Associate Professor of Mechanical and Aerospace Engineering
University of Missouri
INVITED SPEAKER

Rong Yang
Assistant Professor
Robert Frederick Smith School of Chemical and Biomolecular Engineering
Cornell University
INVITED SPEAKER

Dr. Lih-Sheng (Tom) Turng
Department of Mechanical Engineering
University of Wisconsin-Madison
INVITED SPEAKER

THE ITALIAN WAY TO ADVANCED MANUFACTURING
WEDNESDAY, NOVEMBER 20 11:10AM–12:10PM ROOM A106, CONVENTION CENTER

To highlight the potential of an enhanced R&D and trade relationship between Italy and the USA regarding advanced manufacturing, the Italian Trade Agency has partnered this year with the American Society of Mechanical Engineers to create on the occasion of IMECE 2024, a special panel entitled, The Italian Way to Advanced Manufacturing. This will be an opportunity to have engagements in an exciting panel discussion by ASME members and industry experts from Italy on novel technologies coming out of Italy and the best practices for collaborations between Italian and US companies and research centers in the area of advanced manufacturing.

Marriner Merrill
Rochester Institute of Technology
MODERATOR

Eng Francesco Pescatori
Senior Cost Engineer at Baker Hughes Firenze

Antonio Zippo, PhD
Professor of Mechanism and Machine Theory and Mechanical Vibration at the "Enzo Ferrari" Department of Engineering, University of Modena and Reggio Emilia

Caterina Rizzi
Full Professor
Department of Management, Information and Production Engineering (DIGIP)
Università degli Studi di Bergamo

Marco Rossoni
Assistant Professor, Department of Mechanics
Politecnico di Milano

WEDNESDAY, NOVEMBER 20
12:00PM–3:00PM
HALL A, OREGON CONVENTION CENTER

Government Agency Student Poster Competition

Poster Setup:	9:00AM–10:00AM
Judging	10:00AM–3:00PM
General Viewing	12:00PM–3:00PM
Awards	By November 27

Research Podium (Posters Only)

Poster Setup:	9:00AM–10:00AM
Judging:	10:30AM–1:45PM
General Viewing:	12:00PM–2:30PM

MELVILLE MEDAL
MATERIALS DIVISION
WEDNESDAY, NOVEMBER 20
2:00PM-2:10PM
ROOM D138, CONVENTION CENTER

R. Renee Zhao, Ph.D.
Stanford University

For the paper titled, "Curved Ring Origami: Bistable Elastic Folding for Magic Pattern Reconfigurations"

ORR EARLY CAREER AWARD LECTURE
MATERIAL DIVISION
WEDNESDAY, NOVEMBER 20
2:10PM-2:40PM
ROOM D138, CONVENTION CENTER

Xiang Zhang
University of Wyoming

For the paper titled, "Multiscale Reduced Order Modeling and Design of High-Performance Materials: From Metal Fatigue Prediction to Composite Microstructure Design Involving Damage"

2024 SIA NEMAT-NASSER EARLY CAREER AWARD AND LECTURE
MATERIAL DIVISION
WEDNESDAY, NOVEMBER 20
2:40PM-3:10PM
ROOM D138, CONVENTION CENTER

R. Renee Zhao, Ph.D.
Stanford University

For the paper titled, "Functional Architected Materials by Harnessing Structure Instabilities"

2023 SIA NEMAT-NASSER EARLY CAREER AWARD AND LECTURE
MATERIAL DIVISION
WEDNESDAY, NOVEMBER 20
3:10PM-3:40PM
ROOM D138, CONVENTION CENTER

Lihua Jin
UCLA

For the paper titled, "Functional Architected Materials by Harnessing Structure Instabilities"

CENTENNIAL MID-CAREER AWARD LECTURE
MATERIAL DIVISION
WEDNESDAY, NOVEMBER 20
4:05PM-4:40PM
ROOM D138, CONVENTION CENTER

Yashashree Kulkarni
University of Houston

For the paper titled, "Statistical Mechanics of Membranes: Applications from Materials Science to Biology"

NADAI MEDAL
MATERIALS DIVISION
WEDNESDAY, NOVEMBER 20
4:40PM–5:25PM
CONVENTION CENTER, ROOM D138

Julia R. Greer, Ph.D.
California Institute of Technology

For visionary leadership in pioneering the development of 3D nano- and micro-architected materials, inspiring subsequent generations of scientists and engineers in the field of materials by design.

THURSDAY, NOVEMBER 21
8:00AM–8:45AM
(BREAKFAST SERVED FROM 7:30AM TO 8:00AM)
OREGON BALLROOM, CONVENTION CENTER

Madiha El Mehelmy Kotb
Retired
ASME President (2013–2014)
2024 Ralph Coats Roe Medal Recipient

Keynote Title: Dream: How an Unconventional Path to Engineering Can Change the World

The Ralph Coats Roe medal was established in 1972 to recognize outstanding contributions toward a better public understanding and appreciation of the engineer's worth to contemporary society.

Keynote Title: Dream: How an Unconventional Path to Engineering Can Change the World

Abstract:
Do dreams mean anything? From the lush banks of the River Nile of Egypt; home to the stoic eternal Pyramids of Giza and my younger self, then unexpectedly moving to Canada on the other side of the world, my life took so many mind-boggling twists and turns that were at times almost impossible to comprehend. But In Canada my dreams and aspirations, relentless hard work successfully culminated in me becoming a mechanical engineer, then the Chief Boiler and Pressure Vessel Inspectors of Québec ; Vice President Conformity Assessment of ASME, serving of the Board of Governors of ASME and as its 132ndPresident, acting as the Lead Volunteer of Engineering for Change E4C, contributing

a Chapter in the Book '' Daughters of the Nile – Egyptian Women Changing their World", published in English then translated into Arabic and I trust that there are more professional and personal rewards still to come... This morning, I am eager to share my journey and to tell you YES, you can live your Dream, the dream you actually never had!!! We can all make a difference and make the world a better place."

Biography: Madiha El Mehelmy Kotb, retired engineer and veteran of the Provincial Government of Quebec, is honored for outstanding public service and a lifelong commitment and dedication to engineering safety; for leadership and initiative in creating opportunities for sustainable solutions for underserved communities worldwide; and for inspiring future generations of engineers as a speaker and author.
Born in Egypt before relocating to Canada in the 1970s, Ms. Kotb began her career in government service in the 1980s and, during her tenure, served as the Chief Boilers and Pressure Vessels Inspector with the government of Quebec. Ms. Kotb has also served the field of mechanical engineering in multiple ASME roles, most notably working toward the advancement of ASME Safety Standards and Conformity Assessment Programs, serving as a member of the ASME Engineering for Global Development committee, and serving as the 132nd ASME President, the fourth woman and first woman from the Middle East to do so. Additionally, she has been lead volunteer member for Engineering for Change (E4C) and a member of the E4C, LLC management committee.

Ms. Kotb is the recipient of several prior honors, including honorary membership in the National Board of Boiler and Pressure Vessel Inspectors, the CSA Group John Jenkins Award, the 2016 National Board Safety Medal, and the ASME Dedicated Service award. She currently serves on the board of directors of Catapult Design, Inc., a not-for-profit design firm working toward design for social impact.

Ms. Kotb began her engineering education at the American University in Cairo before completing her B.S. and M.S. in mechanical engineering at Concordia University in Montreal. She earned these degrees in 1976 and 1981, respectively.

ROBERT HENRY THURSTON LECTURE AWARD
THURSDAY, NOVEMBER 21
9:00AM–9:45AM
OREGON CONVENTION CENTER, C123

Xin Zhang, Ph.D.
Boston University

For groundbreaking work on innovations, applications, and commercialization of metamaterials, both those that enable highly efficient air-permeable sound silencing and noise reduction and those that markedly boost MRI signal-to-noise ratio, significantly improving performance

Title: Unleashing the Power of Metamaterials to Reduce Noise and Enhance MRI Imaging

Noise control is a major challenge across various industries, often requiring solutions that maintain essential airflow and ventilation. MRI technology, though invaluable for diagnosing diseases, can be expensive and cumbersome. Recent breakthroughs in metamaterials—engineered materials with unique, non-natural properties—promise transformative solutions. In this talk, I will explore two groundbreaking metamaterials: one that dramatically enhances MRI imaging by improving the signal-to-noise ratio, and another that efficiently reduces noise while allowing for unobstructed airflow. These innovations not only advance medical imaging but also address longstanding noise issues in numerous mechanical systems, offering practical and impactful solutions for both healthcare and industrial applications.

Biography: Xin Zhang is the Distinguished Professor of Engineering at Boston University, renowned for her pioneering research in metamaterials and microelectromechanical systems (or microsystems). In addition to the Robert Henry Thurston Lecture Award, her recent accolades include the prestigious Guggenheim Fellowship, the Walston Chubb Award for Innovation from Sigma Xi, the STAT Madness All-Star Award, the Per Bruel Gold Medal for Noise Control and Acoustics, and Technical Achievement Awards from IEEE's EMBS and Sensors Council. She is a Member of the European Academy of Sciences and Arts and a Fellow of the National Academy of Inventors, ASME, IEEE, AAAS, AIMBE, APS, and Optica, and an Associate Fellow of AIAA.

PANEL ON NSF DYNAMICS, CONTROLS, AND COGNITION CLUSTER RESEARCH OPPORTUNITIES
THURSDAY, NOVEMBER 21:
10:05AM–11:05AM
ROOM C123, CONVENTION CENTER

Representatives from the Dynamics, Controls, and Cognition (DCC) cluster of programs will introduce existing and forthcoming division-wide and NSF-wide funding opportunities, followed by a live Q&A session with the audience. These presentations will be of greatest benefit to current faculty members (all ranks) at U.S. Institutions.

THURSDAY, NOVEMBER 21, 12:00PM–1:30PM
LUNCH SERVED 12:00PM–12:30PM
OREGON BALLROOM, CONVENTION CENTER
CLOSING LUNCH KEYNOTE

Susan Margulies, Ph.D.
Assistant Director
U.S. National Science Foundation

Keynote Title: Engineering: Transforming our World for a Better Tomorrow

Abstract: Dr. Susan Margulies, Assistant Director for Engineering of the U.S. National Science Foundation, will discuss priorities and opportunities for engineering research and education. NSF funds frontier research and education across all fields of engineering to create fundamental knowledge. NSF support also builds capacity for engineering research and broadens and prepares a diverse future engineering workforce. In partnership with industry and communities across the nation, NSF's investments lead to innovative technologies and equitable systems for health, sustainability, agriculture, clean energy and water, resilient infrastructure, advanced manufacturing, and communication, which will enhance prosperity and quality of life for all Americans.

Biography: Dr. Susan S. Margulies leads the U.S. National Science Foundation's Directorate for Engineering in its mission to transform our world for a better tomorrow by driving discovery, inspiring innovation, enriching education, and accelerating access. The NSF's Engineering Directorate provides over 40 percent of federal funding for fundamental research in engineering at academic institutions, leading to innovative technologies and sustainable impacts in health, agriculture, clean energy and water, resilient infrastructure, advanced manufacturing and communication systems, and many other areas. NSF support also builds the Nation's workforce capacity in engineering and supports the diversity and inclusion of engineers at all career stages. Projects span frontier research to generate new knowledge, problem-driven research to identify new solutions to societal challenges, and application-driven research to translate discoveries to uses that enhance prosperity, equity, and quality of life for all Americans.

Margulies joined the NSF as the assistant director for the Directorate for Engineering in August 2021 after leading the Wallace H. Coulter Department of Biomedical Engineering at the Georgia Institute of Technology and Emory University. While on detail at the NSF, she is a professor and Georgia Research Alliance Eminent Scholar at Georgia Tech and Emory. Margulies is internationally recognized for pioneering studies to identify mechanisms underlying brain injuries in children and adolescents and lung injuries associated with mechanical ventilation, leading to improved injury prevention, diagnosis, and treatments. Margulies' transdisciplinary scholarly impact has been recognized by her election as fellow of the American Society of Mechanical Engineers, the Biomedical Engineering Society, and the American Institute for Medical and Biological Engineering, and as a member of the American Academy of Arts and Sciences, the National Academy of Engineering, and the National Academy of Medicine.

- Abundant greenhouse gas (GHG)-free primary energy
- An intermodal energy superhighway that accommodates diversified forms of GHG-free primary energy
- An abundant and renewable carbon transition that addresses projected demand for polymers and other carbon-based materials

THURSDAY, NOVEMBER 21:
5:30PM–6:30PM
HYATT HOTEL
CLOSING RECEPTION

Join us as we say farewell to our colleagues and closeout IMECE 2024.

Plenary Events

TRACK 1: ACOUSTICS, VIBRATION, & PHONONICS

TUESDAY, NOVEMBER 19
9:45AM-10:30AM
ROOM B114, CONVENTION CENTER

Yoel Fink
NCAD

Biography: Professor Fink earned a B.S. in chemical engineering at the Technion-Israel Institute of Technology in 1994 and a B.A. in physics at the school in 1995. He earned a Ph.D. in materials science at MIT in 2000. Later that year he joined the faculty of DMSE, and in 2011 he became a joint professor of Electrical Engineering and Computer Science. Professor Fink is a co-founder of OmniGuide and served as its chief executive officer from 2007 to 2010 and as a member of its board of directors until 2014. He is the co-author of more than 80 scientific journal articles and holds 60 issued U.S. patents on photonic fibers and devices.
Professor Fink's research interests are in the theory, design, fabrication, and characterization of multimaterial, multifunctional fibers, and fiber assemblies. Fibers are among the earliest forms of human expression, yet have remained unchanged from ancient to modern times. Professor Fink's research group focuses on extending the frontiers of fiber materials from optical transmission to encompass electronic, optoelectronic, and even acoustic properties. What makes these fibers unique is the combination of a multiplicity of disparate materials arranged in elaborate geometries with features down to 10 nanometers. Two complementary approaches toward realizing sophisticated functions are used: on the single-fiber level, the integration of a multiplicity of functional components into one fiber, and on the multiple-fiber level, the assembly of large-scale fiber arrays and fabrics. Professor Fink's multimaterial fibers offer unprecedented control over material properties and function on length scales spanning the nanometer to kilometer range.

MONDAY, NOVEMBER 18
9:15AM-10:00AM
ROOM A105, CONVENTION CENTER

Chiara Daraio
California Institute of Technology

Presentation Title: Breaking Periodicity in Metamaterials: New Functionalities and Applications

Abstract: Metamaterials that break conventional periodicity offer unique pathways for unlocking novel functionalities. In this presentation, we explore two key examples: 1) the design of tunable lenses and implantable acoustic focusing devices, and 2) the creation of polycatenated architected materials with unprecedented mechanical responses. We begin by discussing tunable metasurfaces, describing flat acoustic lenses that integrate a well-known diffractive pattern design, the Fresnel zone plates, into a deformable membrane that can be easily inflated nonplanarly via hydraulic control. These lenses provide dynamic control over focusing by adjusting the membrane's curvature, allowing real-time modulation of focal length and correction of aberrations at varying incidence angles. This tunability addresses limitations of static acoustic lenses. Following this, we will demonstrate how the miniaturization of multifocal gradient-index (GRIN) metamaterial lenses can be integrated in conformal acoustic windows, based on mechanical metamaterials, designed for functional ultrasound imaging in vivo. These novel skull prostheses offer long-term biocompatibility and sonotransparency, supporting high-resolution neural imaging. Finally, we will introduce a class of metamaterials that consist of discrete particles concatenated in three-dimensional domains, forming polycatenated architected materials. We will present a general design framework that transforms periodic, crystalline networks into irregular particle concatenations and geometries. At small strains, the resulting metamaterials behave like non-Newtonian fluids, showing both shear-thinning and shear-thickening responses. At larger strains, they behave like lattices and foams, showing a nonlinear stress-strain relation.

Biography: Prof. Daraio's research focuses on developing new materials with advanced mechanical and sensing properties, for application in soft robotics, wearable devices, and shock/vibration absorption. Her lab is interested in understanding how different physical functions in new materials arise from their micro- and meso-structure, in both ordered and disordered media. Some of the applications of her research include new materials and methods for acoustic imaging and thermal sensing for health monitoring, smart and tunable fabrics, as well as sustainable materials for packaging and construction. Her work is primarily experimental, but it is informed by numerical and analytical studies, which serve as a guide in new material design, fabrication, and validation of their properties.
Prof. Daraio is the G. Bradford Jones Professor of Mechanical Engineering and Applied Physics and Heritage Medical Research Institute Investigator at Caltech. She earned a bachelor's degree in mechanical engineering from the University of Ancona in Italy, and later received master's and doctoral degrees in materials science and engineering from UC San Diego. Daraio first came to Caltech as an assistant professor in 2006 and has since spent her career at the Institute. From 2013 to 2016, she was also a faculty member and chair of mechanics and materials at ETH Zürich.

TRACK 2: ADVANCED DESIGN AND INFORMATION TECHNOLOGIES

MONDAY, NOVEMBER 18
9:15AM-10:00AM
ROOM A106, CONVENTION CENTER

John G. Michopoulos
U.S. Naval Research Laboratory

Presentation Title: Metacomputing for Multiphysics Applications

Abstract: When a multiphysics model is required to be developed and executed for simulation purposes, the advances of analytical, numerical, software, and hardware computational technologies have forced its users to manage higher resource complexity while at the same time motivates the modeling of more complex systems than before. Consequently, the time for the user's iterations within the context space characterizing all choices required for a successful computation far exceeds the time required for the runtime software execution to produce acceptable results. This presentation focuses on utilizing metacomputing to alleviate this issue starting with describing this high-dimensional context space. Then it highlights the abstract process of multiphysics model generation/solution and proposes performing top-down and bottom-up metacomputing. In the top-down approach, metacomputing is used for automating the process of generating theories; raising the semantic dimensionality of these theories in higher dimensional algebraic systems that enable simplification of the equational representation, and raising the syntactic dimensionality of equational representation from 1D equational forms to 2D and 3D algebraic solution graphs that reduce solving to path-following. In the bottom-up approach, already existing legacy codes evolving over multiple decades are encapsulated at the bottom layer of a multilayer semantic framework that utilizes Category Theory based operations on specifications to enable the user to spend time only for defining the physics of the relevant problem and not have to deal with the rest of the details involved in deploying and executing the solution of the problem at hand. Consequently, these two metacomputing approaches enable the automated generation, composition, deployment, and execution of directly computable multiphysics models.

Biography: As a Principal Scientist of Materials Innovation in the Materials Science and Technology Division and as the head of Computational Multiphysics Systems Lab (CMSL), of the Center for Material Physics and Technology at the US Naval Research Laboratory (US-NRL), Dr. Michopoulos executes and oversees multi-physics modeling and simulation efforts and computational sciences research and development, operations, and initiatives at US-NRL. Some of his major initiatives include research and development on linking material performance to material processing via data and specification driven methodologies, additive and hybrid manufacturing process and material modeling, mechatronic/robotic data-driven characterization of continua, multiphysics design optimization, and meta-computing. He is a member of the editorial board of several scientific journals and is member of the program committee of several international conferences and has chaired several of them. He has served in the executive committee of the Computers and Information in the engineering division of the ASME. He is Fellow of ASME and his technical work and leadership have been recognized by several national and international honors, including the 2015 Excellence in Research award and the 2022 Lifetime Achievement award by ASME's CIE division, the 2015 Innovator Award by Wolfram Inc., and the 2013 "P.S. Theocaris" award for excellence by the National Academy of Athens. He has authored and co-authored more than 380 publications and patents. Dr. Michopoulos holds a Diploma/M.Sc. in Civil Engineering and a Ph.D. in Applied Mathematics and Mechanics from the National Technical University of Athens and has pursued post-doctoral studies at Lehigh University on computational multi-field modeling of continua and Fracture Mechanics.

TRACK 3: ADVANCED MANUFACTURING

MONDAY, NOVEMBER 18
9:15AM-10:00AM
ROOM C123, CONVENTION CENTER

Jian Cao
Northwestern University

Presentation Title: Physics-Based AI-Assisted Design and Control in Flexible Manufacturing

Abstract: Current research efforts at my manufacturing group are rooted in advancing new flexible manufacturing processes using the hybrid physics-based data-driven approaches. In this talk, I will post the manufacturing challenges that we are facing and use two flexible processes, i.e., metal powder-based additive manufacturing and rapid dieless forming for producing three-dimensional parts without geometry-specific tooling, as demonstration cases. Specifically, I will show how the integration of the fundamental process mechanics, process control, and techniques including machine learning to achieve effective and efficient predictions of material's mechanical behavior due to or during a manufacturing process. Furthermore, I will show how we use machine learning for active sensing with the goal of effective in situ local process control. Our solutions particularly target three notoriously challenging aspects of the process, i.e., long history-dependent properties, complex geometric features, and the high dimensionality of their design space.

Biography: Cardiss Collins Professor Jian Cao (MIT'95, MIT'92, SJTU'89) specialized in innovative manufacturing processes and systems, particularly in the areas of deformation-based processes and laser additive manufacturing processes. Prof. Cao is an elected member of the

National Academy of Engineering (NAE) and of the American Academy of Arts and Sciences (AAA&S). She is the Founding Director of the research center on Manufacturing Science and Innovation at Northwestern, known as NIMSI. Cao is a Fellow of American Association for the Advancement of Science (AAAS), ASME, the International Academy for Production Engineering (CIRP), and SME. Her major awards include DoD Vannevar Bush Faculty Fellowship, ASME Ted Belytschko Applied Mechanics Award, ASME Milton C. Shaw Manufacturing Research Medal, Charles Russ Richards Memorial Award from ASME and Pi Tau Sigma, SME Gold Medal, and SME Frederick W. Taylor Research Medal. Prof. Cao was the Editor-in-Chief of Journal of Materials Processing Technology, and now serves as an Associate Vice President for Research at Northwestern, a member of the National Materials and Manufacturing Board of the National Academies, Board of Directors of SME, and Board of mHUB – accelerator for hardtech innovation and manufacturing in Chicago.

TUESDAY, NOVEMBER 19
9:45AM-10:30AM
ROOM A105, CONVENTION CENTER

John Martin
Research Director
America Makes/NCDMM

Presentation Title: America Makes Ongoing Efforts in Delta Qualification, Casting & Forging, and Alloy Development for Additive Manufacturing

Abstract: Driven by the National Center for Defense Manufacturing and Machining (NCDMM), America Makes is a Department of Defense Manufacturing Innovation Institute focused on additive manufacturing (AM) technologies. Since its inception in 2012, America Makes has leveraged a national collaborative ecosystem to advance the readiness level of AM technologies and invigorate the knowledge base, skills, and training available for the domestic AM supply chain. Our strategy is the product of collaboration with our membership, which is comprised of representation from all tiers of the government, industry, and academia. Our research efforts include all aspects of additive including ancillary technologies such as monitoring, post-processing procedures, and inspection technologies as well as testing. This presentation will provide an overview of America Makes history and structure as well as an update on several projects currently underway at the Institute. The project overviews will address topics such as gaining a better understanding of the necessary rigors of various re-qualification (i.e., delta-qual) processes, demonstrating how AM technology can improve productivity and reduce cost for casting and forging applications, and the development and scaling of novel AM alloy materials.

Biography: As the Research Director for America Makes/NCDMM, John is responsible for growing the AM ecosystem and driving value from the Institute's technology portfolio through strategic partnerships and member collaboration. Before joining America Makes in 2023, John was a full-time professor of Mechanical Engineering Technology at Youngstown State University for nearly a decade. During his tenure, he had the opportunity to speak at professional conferences, publish his research findings, and work on AM research initiatives including Industry 4.0 Adoption in the SME Defense Supply Chain for Metal Castings, as well as the Air Force Research Laboratory's Maturation of Advanced Manufacturing for Low-Cost Sustainment (MAMLS). In addition, he has experience and knowledge of operating a wide range of 3D printers and software. Prior to his academic career, John worked as a mechanical engineer and, most notably, participated in the research, design, and optimization of industry-standard equipment to increase efficiency and quality and control for manufacturing processes. John received his bachelor's and master's degree in mechanical engineering from YSU and is currently nearing completion of his Ph.D. in Materials Science and Engineering. He is a skilled researcher and academic professional specializing in AM with a diverse and extensive background in materials science and mechanical engineering.

TRACK 4: ADVANCED MATERIALS: DESIGN, PROCESSING, CHARACTERIZATION, & APPLICATIONS

WEDNESDAY, NOVEMBER 20
8:00AM-8:45AM
ROOM A106, CONVENTION CENTER

Narayana Aluru
University of Texas at Austin

Sponsor: Materials Division

Presentation Title: Twist, Memory, and Coulomb Drag in Hard/Soft Matter Interfaces

Abstract: Materials and their interfaces play an important role in many societally important applications such as energy, separations, and sensing. In this talk, we will discuss our recent work in three interrelated topics – twist, memory, and Coulomb drag. First, we will consider materials interfaces between an electronically active material and an interfacial soft matter. Specifically, dynamically manipulating interfacial properties of soft matter (e.g., liquids) by tuning the electronic correlations in a hard material is an area of significant interest. Twisted bilayer graphene, particularly at the magic angle, has garnered attention for its unconventional superconductivity and correlated insulator behavior due to strong

electronic correlations. The impact of the electronic properties of moiré patterns in twisted bilayer graphene on structural and dynamic properties of interfacial water remains largely unexplored. Computational challenges, stemming from simulating large unit cells using density functional theory, have hindered progress. In the first part of the talk, we will discuss deep learning studies to understand how a twist in a bilayer graphene affects the interfacial properties of liquids. Second, we will discuss memory effects in electrolyte transport through nanoporous materials. We show that asymmetry in transport properties due to ordering in confinement leads to hysteresis in current-voltage characteristics. Finally, we discuss the quantum coupling between electrons in a solid and interfacial molecule. Specifically, we show Coulomb drag effects where moving electrons in a solid induce forces on interfacial molecules causing them to undergo significant electromigration.

Biography: Dr. Aluru joined the Walker Department of Mechanical Engineering at the University of Texas at Austin in August 2021. He is also a core faculty member in the Oden Institute for Computational Engineering and Sciences. He received the B.E. degree from the Birla Institute of Technology and Science (BITS), Pilani, India, in 1989, the M.S. degree from Rensselaer Polytechnic Institute, Troy, NY, in 1991, and the Ph.D. degree from Stanford University, Stanford, CA, in 1995. He was a Postdoctoral Associate at the Massachusetts Institute of Technology (MIT), Cambridge, from 1995 to 1997. He was on the faculty at the University of Illinois at Urbana-Champaign from 1998 to 2021.

Dr. Aluru's general area of research is computational nanotechnology. His group works on the development of multiscale methods combining quantum, atomistic, mesoscale and continuum scales, and application of multiscale methods to study physics of nanofluidics, bionanotechnology, nanomaterials/nanoelectromechanical systems, and soft matter. Some of the applications his group works on include water desalination, nanopower generation, DNA sequencing, protein recognition, 2D materials-based chemical and biological sensing, CO2 reduction, energy storage, etc.

TUESDAY, NOVEMBER 19TH
9:45AM-10:30AM
ROOM A106, CONVENTION CENTER

Suresh Babu
University of Tennessee

Sponsor: Materials Division/IMECE

Presentation Title: Towards Part Specific Qualification of Additively Manufactured Metallic Components

Abstract: In the last decade, additive manufacturing (AM) has become a viable pathway for making metallic components for aerospace and energy applications. Although the feasibility of AM to make complex geometric components has been demonstrated, the ability to qualify these components for critical applications remains elusive. This challenge is related to spatial and temporal variations of thermal, mechanical, and chemical signatures within a single component that are quite different from traditional manufacturing. As a result, coupon-based qualification of AM parts may not be applicable in all cases. In this talk, an overview of the existing qualification methods that are based on extensive testing, as well as emerging techniques that are based on in situ monitoring, computational modeling, machine learning, and artificial intelligence will be presented. The application of these tools will be demonstrated with case studies of qualifying metallic components produced by AM for energy and aerospace applications. The case studies will span various powder bed fusion and directed energy deposition processes for titanium, nickel, and stainless steels. In addition, efforts to transfer these hardware and software technologies to industries will also be discussed. Finally, the future directions of AM to arrive at site-specific properties and incorporation of sensors through solid-state additive manufacturing will be highlighted.

Biography: Dr. Babu obtained his bachelor's degree in metallurgical engineering from PSG College of Technology, Coimbatore, India, and his master's degree in industrial welding metallurgy-materials joining from Indian Institute of Technology, Madras. He obtained his Ph.D. in materials science and metallurgy from the University of Cambridge, UK in 1992. He also worked as a research associate in the prestigious Institute for Materials Research, Sendai, Japan before joining ORNL in 1993. From 1993 to 1997, he held joint researcher position with ORNL, University of Tennessee and The Penn State University. From 1997 to 2005, he worked as an R&D staff at ORNL. From 2005 to 2007, Suresh held a senior level technology leader position in the area of engineering and materials at Edison Welding Institute, Columbus, Ohio. From 2007 to 2013, Suresh served as Professor of Materials Science and Engineering and Director of NSF I/UCRC Center for Materials Joining Science for Energy Applications, at The Ohio State University. In 2013, Suresh was appointed as UT/ORNL Governor's chair of advanced manufacturing at the University of Tennessee, Knoxville, TN. In this role he acts as a bridge to the ORNL's expertise and infrastructure including manufacturing demonstration facility to develop a collaborative research and education ecosystem locally and deploy engineering solutions to manufacturing industries. In 2019, Suresh was also appointed as Director of Bredesen Center for Interdisciplinary Research and Education for Energy- and Data-Science and Engineering. In 2020, Suresh was selected to be the founding educational director of the UT-Oak Ridge Innovation Institute. In 2020, Suresh was appointed to the National Science Board by the President of the United States of America for a six-year term. In 2022, Suresh was appointed as inaugural position of senior advisor for research and STEM to the Provost and Vice Chancellor of Research.

TRACK 5: ADVANCES IN AEROSPACE TECHNOLOGY

WEDNESDAY, NOVEMBER 20
8:00AM-8:45AM
ROOM A105, CONVENTION CENTER

Rakesh Kapania
Fellow, AIAA and the Royal Aeronautical Society

Presentation Title: Learning From Nature: Bioinspired Design of Thin-Walled Structures Using Curvilinear Stiffening

Abstract: Humans are constantly striving to reduce the weight of thin-walled structures used in automobile, marine, and aerospace structures to improve their performance such as reduced-fuel consumption and increased payload. A constant source of inspiration for achieving this goal is nature, where curvilinear stiffening is used to stiffen and strengthen thin-walled structures. Until a few years ago, designing and fabricating curvilinearly stiffened thin-walled structures was nearly impossible; achieving optimal designing was difficult because of the need for enormous computational power, and fabrication was almost impossible because of the unavailability of affordable approaches to precisely fabricate curvilinearly stiffened plates and shells. The availability of high-performance computing, including Graphical Processing Units and machine learning, now makes it possible to optimally design curvilinearly stiffened structures. Additionally, the availability of additive manufacturing now allows us to fabricate these structures. For nearly two decades years, the speaker and his research group have been involved with research on using advanced computing and machine learning to design structures, both metallic and composites, with curvilinear stiffening. The optimal design includes constraints on buckling, displacement, stress, crippling, damage tolerance, acoustics, aeroelasticity, crack growth analysis, minimum thickness for manufacturing, integration of flaw effects, and manufacturing distortion. The talk will also describe the approaches used to achieve the optimal design of panels. In addition, we will also present the results of our research on reinforcing the wing structure using curvilinear Spars and Ribs, which we have termed as SpaRibs.

Biography: Dr. Rakesh K. Kapania graduated from Purdue University with a Ph.D. in Aeronautics and Astronautics in 1985. As an expert on aerospace structures, Dr. Kapania has made very significant contributions to aerospace engineering, in general, and aerospace structures, in particular. For the last three decades, he has served as a teacher, scholar, and researcher. Many of his undergraduate students are working in U.S. industry, and his trained researchers are working in academia, industry, and government labs. He has guided 68 M.S., 56 Ph.D., students to completion and has mentored 19 post-doctoral fellows. Dr. Kapania has authored over 225 archival journal articles published primarily by AIAA, 380+ conference papers and presentations largely at the SDM conference and AIAA SciTech Forum, and two book chapters. He is currently serving as an associate editor of the AIAA Journal, and as a member of the AIAA Education Book Series advisory board, has served on the AIAA's Structures Technical Committee, NRC Review Panel for NASA's Roadmap for future research, and member of the Daniel Guggenheim Medal Award Board.

Dr. Kapania has managed 113 research projects funded by many agencies. He led two large programs contributing to the design of both civilian and military future aerospace vehicles including a three-year $3.3 Million, NASA-Virginia Tech-Lockheed Martin program on Unitized Structures fabricated by modern manufacturing processes such as the Electronic Beam Free Form Fabrication, laser sintering, and other methods; and AFRL-Virginia Tech-Wright State University Collaborative Center on Multidisciplinary Sciences over 6.5 years at a level of $6.5M. Leading a team of 16 graduate students, he is contributing significantly to basic and applied research in aerospace structures in unitized structures, multidisciplinary design of truss-braced aircraft, highly-flexible wings and composite structures. He was also a part of a team selected by NASA on a multi-institution, five-year research project on mission adaptive aeroelastic wings. Dr. Kapania has been widely recognized for his contributions to aerospace education and research. He was honored by the Mitchell professorship. For his research contributions, Dr. Kapania was awarded the Dean's Award for Excellence in Research in 2000 and 2010. In 1996, he received the Boeing's Welliver Fellowship for his commitment to undergraduate education. Dr. Kapania was awarded the Boeing Research and Technology Performance and Innovation Award in 2014 for his research on nonlinear aeroelasticity of Truss-Braced Wings. His alma mater the Purdue University awarded him an Outstanding Aerospace Award and the Indian Institute of Science as a distinguished alumnus of the Department of Aerospace Engineering.
Dr. Kapania is a Fellow of the AIAA and the Royal Aeronautical Society.

THURSDAY, NOVEMBER 21
9:00AM-9:45AM
ROOM B114, CONVENTION CENTER

Jamey D. Jacob
Oklahoma Aerospace Institute for Research and Education

Presentation Title: Putting the AI in Advanced Air Mobility

Abstract: The promulgation of unmanned aircraft systems (UAS) as a ubiquitous platform has generated both aviation opportunities and challenges, particularly when it comes to integration into the NAS (national airspace). Likewise, increasingly larger autonomous aircraft in the form of advanced air mobility (AAM) systems will also require unique solutions. Each will require new systems and approaches for integration

into the NAS and require navigation solutions as part of the unmanned traffic management (UTM) network development and implementation. In particular, the challenges of sensing hazards include non-traditional risks from environmental parameters such as high spatial turbulence gradients, high turbulence magnitudes, and degraded position references, all of which complicate the traditional approach. This is particularly true in urban environments where the presence of buildings produces not only obstacles but also complex, unsteady flow patterns. Local wind-field sensing onboard AAM is often approached via combining relative sensing and inertial reference measurements. Swarming and mesh network topologies are attractive for integrating additional sensing platforms into this measurement challenge. In addition, the threat of midair collisions between unmanned and manned aircraft in the NAS represents an unknown risk of integrating operations between disparate airspace users. This will be a vexing issue for the integration of urban air mobility (UAM) solutions as part of UTM development and implementation. This presentation discusses integration approaches and field tests for utilizing tools such as AI to provide real-time data to inform the UTM and enable AAM operations by addressing emerging needs in real-time weather forecasting to improve the safety of low altitude aircraft operations through the integration of real-time observations from autonomous systems with numerical weather prediction and flight management and safety systems, thus improving the resolution and accuracy of comprehensive environmental and hazard estimation, which is critical to improving safety and operational efficiency.

Biography: Jamey Jacob is the Executive Director of the OSU Oklahoma Aerospace Institute for Research and Education (OAIRE) and the Williams Chair in Energy Technology and Regents Professor of Aerospace Engineering in the School of Mechanical and Aerospace Engineering at Oklahoma State University. His current efforts are focused on emerging technology and the societal impact of advanced mobility and their enhanced operation in the national airspace for broader innovative applications. He is currently lead on the NASA University Leadership Initiative program WINDMAP to develop aviation weather solutions for advanced aerial mobility applications, including drones and urban air taxis. He is the director for the Counter-UAS Center of Excellence focused on assessing and mitigating UAS threats both at home and abroad. As part of recent EDA funding through the Build Back Better program, he is leading the development of the LaunchPad Center for Advanced Air Mobility in Tulsa and affiliated Skyway Range operated by the Osage Nation and the associated Tech Hubs for trusted and equitable autonomy. He received his B.S. in Aerospace Engineering from the University of Oklahoma in 1990 and his M.S and Ph.D. in Mechanical Engineering from the University of California at Berkeley in 1992 and 1995, respectively. He was a National Research Council Summer Faculty Fellow in the Air Force Research Laboratory and received the SAE Ralph Teetor Award, the Lockheed Martin Teaching Award, and the OSU Regents Distinguished Teaching and Research Awards, among other mentoring accolades. He is a native Oklahoman and dedicates much of his efforts to STEM workforce development, tribal engagement, and increasing diversity in engineering and science.

TRACK 6: BIOMEDICAL & BIOTECHNOLOGY ENGINEERING

MONDAY, NOVEMBER 18
9:15AM-10:00AM
ROOM B113, CONVENTION CENTER

Arthur Erdman
University of Minnesota

Presentation Title: Challenges in the Medical Device Design

Abstract: Mechanical Engineering curriculums are much better than in the past at including open ended design experiences. However, the medical device design process is more complex and challenging than other product design areas that are not regulated carefully. A ME senior design team may have a project sponsored by a medical device company, but without training in the areas of anatomy, physiology and appropriate disease states, it's not likely that an idea to bedside useful solution will occur.

A graduate from a biomedical engineering program will have much more general knowledge about the human body systems but usually the fundamental engineering principles can be glossed over due to time constraints in most BME curriculums. Cross functional teams, including engineers, medical experts, regulatory and reimbursement folks are essential to developing appropriate solutions to healthcare problems. Large companies either have employees or access to expertise in all these areas. Small and start up companies struggle to gain timely information as they proceed through a product development cycle. Some Universities have found ways to supplement traditional degrees to help address this issue. Some examples of successful deployment of product development principles for improving healthcare will be presented and discussed. In instances where the medical device industry integrates closely with University programs, the appropriate training is accelerated. One such example is the development of the Coventor during the early months of the onset of Covid.

Biography: Arthur G. Erdman, P.E., is the Richard C. Jordan Professor and a Distinguished Teaching Professor of Mechanical Engineering at the University of Minnesota, specializing in mechanical design, bioengineering, and product design. He is the Founding Director of the Earl Bakken Medical Devices Center at the U of MN and was also the Co-Founding Editor of the ASME Journal of Medical Devices. He received his B.S. degree at Rutgers University, his M.S. and Ph.D. at RPI. Dr. Erdman has published over 395 technical papers, 3 books, is co-inventor of over 48 patents and shares 9 Best Paper Awards with his colleagues. He has consulted at over 50 companies in mechanical, biomedical and product design. He has received a number of ASME awards including the Machine Design Award, the Outstanding Design Educator Award and the Savio L-Y

Woo Translational Biomechanics Medal. He has also been the Chair of twenty-three Design of Medical Devices Conferences.

TUESDAY, NOVEMBER 19
9:45AM-10:30AM
ROOM D135, CONVENTION CENTER

Guy Genin
Washington University in St. Louis

Presentation Title: The Physics of Navigation Failures In Vascular Surgery, and Solutions Inspired by Plant Mechanobiology

Abstract: The standard of care in stroke treatment is to restore blood flow surgically by accessing the site of blockage through the vasculature. The procedure is a race against the clock to deliver surgical tools to this site, with delays of minutes leading to worse long-term outcomes for the patient. We focus on a critical class of navigation failures called "herniation" that can delay surgery by tens of minutes, and that can occur without warning. In these, a curved portion of the intravascular catheter can drop down suddenly, causing the surgeon to lose control of the distal end of the catheter, and often requiring the surgeon to remove the catheter set and repeat the procedure with a new one. We show that these failures of navigation can now be predicted by treating herniation as a mechanical bifurcation, and present classes of design adaptations to catheters that can reduce the likelihood of these bifurcations by mimicking mechanobiological mechanisms present in epidermal cells of plant shoots and roots.

Biography: Guy M. Genin applies fundamental concepts from engineering to control and probe living systems. His work advances surgical techniques, molecular detection, and therapies for inflammation, wound healing, and fibrosis. Genin serves as the Harold and Kathleen Faught Professor of Mechanical Engineering at Washington University, with appointments in Biomedical Engineering and Neurological Surgery. At Xi'an Jiaotong University, he serves as Thousand Talents Plan Professor of Life Sciences. Genin co-directs the NSF Science and Technology Center for Engineering Mechanobiology. He serves on the U.S. Interagency Modeling and Analysis Group's steering committee and the Society of Engineering Science's Board of Directors. A fellow of ASME, AIMBE, IAMBE, and the U.S. National Academy of Inventors, Genin is chief engineer of Caeli Vascular, Inc., and CTO of Inflexion Vascular, LLC. He is currently an associate editor of Biophysical Journal. Genin is the recipient of awards including a Research Career Award from the NIH; the Skalak Award and Van Mow Medal from ASME; the Changjiang Scholar Award from the Chinese Ministry of Education; and the Eads Medal from the St. Louis Academy of Science. He earned bachelor's and master's degrees from Case Western Reserve University and master's and doctoral degrees from Harvard, and completed postdoctoral training at Cambridge and Brown.

TRACK 7: DYNAMICS, VIBRATION & CONTROL

THURSDAY, NOVEMBER 21
9:00-9:45AM
ROOM A105, CONVENTION CENTER

Farbod Alijani
TU Delft

Sponsor: Applied Mechanics Division

Presentation Title: Harnessing Nanomechanical Vibrations of Two-Dimensional (2D) Materials

Abstract: Two-dimensional (2D) materials are unique platforms for studying fundamental science. They bridge the gap between the world of atomic scale dynamics and the world of macroscopic mechanical vibrations. Because to their size nature, they can enable exploration of research areas that lie at the forefront of classical and quantum technologies. But at the same time, their noisy and nonlinear nature limits their performance. This combination of fluctuations and nonlinearities brings to light a new regime of mechanics that has remained largely unexplored, and that, if well-understood, can open a wide range of trajectories in high-performance sensing and lab-on-a chip devices. In this talk, I will present theory and experiments for using nonlinear and noisy dynamics of 2D materials to sense the nanomechanical properties of ultrathin materials, unravel their nonlinear dissipation processes and detect very weak signals. By fitting experimental data with nonlinear models and relating nonlinear parameters to membrane nanomechanics, I first propose contactless methods for extracting material properties of 2D materials. I will then show how by engineering nonlinear damping in these materials mechanical frequency combs can be generated, and highlight the role of parametric resonance as an ultrasensitive probe for nonlinear dissipation measurements. Finally, I discuss the use of noisy dynamics of 2D materials for detecting nanomechanical motion of micro-organisms, and show how this rich and complex dynamics can be used to infer new information about infectious diseases and detect antibiotic resistance at the single cell level.

Biography: Farbod Alijani is an associate professor in the Precision and Microsystems Engineering (PME) department at TU Delft. His research line focuses on understanding fundamental phenomena associated with linear and nonlinear dynamics of micro and nanomechanical systems to engineer novel technologies in the fields as varied as high-tech systems and bio-health. This includes modelling, fabrication, and testing very sensitive and extremely small structures. Some of these devices are

one to a few atoms thick such as graphene, which can produce new features, non-existent at larger scales. Since these devices are too small to be studied by conventional techniques, Farbod's group focuses on the development of unique characterization methodologies to study mechanical behaviour at the nanoscale. One such technology led to the demonstration nanomechanical motion of single bacteria using graphene drums that was nominated as the science breakthrough of the year in 2022 by the falling walls foundation and is currently at the centre of SoundCell B.V; a start-up that aims at delivering rapid diagnostic technologies for fighting antibiotic resistance. In addition to this technology, Farbod's group also has strong track record in disclosing new phenomena and new tools in nanotechnology that have been published by Nature Nanotechnology, Nature Communications, and Physical Review Letters. Farbod is recipient of European Research Council (ERC) starting, proof-of-concept, and consolidator grants, that are the most prestigious in Europe, as well as European Innovation Council (EIC) transition grant. He is co-inventor of 4 patents and is currently serving in the editorial board of International Journal of Non-linear Mechanics.

WEDNESDAY, NOVEMBER 20
8:00AM-8:45AM
ROOM C123, CONVENTION CENTER

Erasmo Carrera
Politecnico di Torino

Presentation Title: Vibrations of Loaded Structures Accounting for Geometrical Nonlinear Effects and CUF Beam/Plate/Shell Finite Elements Analysis

Abstract: Nonlinear phenomena dominate many engineering problems in various fields. At least one of the three main nonlinearities is often involved: geometrical (stability), physical (material nonlinearities), and unknown boundary condition (contact, impact). Finite Element Methods is by decades the most suitable computational method for both linear and nonlinear problems. Linear problems consist of one-shot analysis, nonlinear ones require multi-shot analysis. This simple fact is the most significant distinction between linear and nonlinear analysis; that is the approximation, e.g., errors in linear analysis, could propagate in a multi-shot case. Therefore, in order to solve in a suitable manner nonlinear problems very efficient "as a whole" numerical models are required. It is a well-known fact that assumption of classical beam, plate, and shell theories often lead to solutions that could deviate significantly from the exact ones. On the other hand, the use of simplified nonlinear relations (such as von Kármán approximations) could lead to large errors to detect the correct solutions when the equilibrium path is far from the undeformed configurations.

In recent years, the author and co-workers have successfully introduced and extended the Carrera Unified Formulation, CUF, which is a hierarchical framework to develop any theory of structures for beams, plates, and shells including laminated structures and multifield loadings. These have been extended and applied to various nonlinear problems with excellent and unique accuracy. FEs applications have been developed extensively. It has been shown that such accuracy could be only achieved by the use of solid-3D Finite Elements if commercial software is referred to, nevertheless, the computation costs of 3D analysis could become prohibitive. This talk shortly overviews some of the most interesting problems solved by CUF: buckling and post-buckling of thin-walled structures, plasticity, progressive failure in laminates, low-velocity impact. The main focus is the nonlinear vibration problems of loaded structures in the very large displacement/rotation equilibrium states. The extraordinary advantages of CUF usage with respect to other models will be made clearly evident. Particular attention will be given to the application to stability analysis in both linearized and nonlinear cases, via the so-called vibration-correlation technique (VCT).

Biography: Erasmo Carrera graduated in Aeronautics in 1986 and in Space Engineering in 1988 at the Politecnico di Torino. He obtained his Ph.D. in Aerospace Engineering in 1991 in the framework of a joint Ph.D. programme between the Politecnico di Milano, Politecnico di Torino and the Università di Pisa. He became Assistant professor in 1992, Associate Professor (2000), and Full Professor (2010) at the Politecnico di Torino. Dr. Carrera has been visiting professor at the University of Stuttgart, Virginia Tech, Supmeca, CRP Tudor, RMIT. As HiCi Scientist Carrera became member of Distinguished Professor Committee of King Abdulaziz University, and since 2019 Honorary Professor at Prince Mohammad Bin Fahd University, Al-Khobar.

He has been tutor of about 500 Bachelor and Master Theses and about 50 PhDs. His research topics cover: composite materials, nonlinear problems and the stability of structures, vibrations of continuous systems, rotor and nonlinear dynamics, contact mechanics, multibody dynamics, finite elements, path following methods in nonlinear FE analysis, meshless methods, unconventional lifting systems, smart structures, thermal stress for coupled and uncoupled problems, multifield interaction, aeroelasticity, panel flutter, wind blades, advanced theories for beams, plates and shells, mixed variational methods; zig-zag, mixed, and layer-wise modelings for multilayered beams plates and shells.

Carrera has introduced the Unified Formulation, or CUF (Carrera Unifed Formulation), as a tool to establish a new framework in which to develop theories of beams, plates, and shells for metallic and composite multilayered structures loaded by mechanical, thermal electrical, and magnetic loadings. CUF permits any expansion of the unknown variables over the thickness/cross-section domain to be handled in a compact manner via a few fundamental nuclei FNs whose forms do not depend on the order of the used expansion or on the used base functions. Three CUF outcome are the Best Theory Diagram (BTD), the Component Wise (CW), and node dependent kinematic NDK Finite Elements.

Carrera has been author and coauthor of about 800 papers on the above topics and six recent books. Carrera's papers have had more than 30,000 citations with h-index = 80. Carrera has been recipient of various 'best paper award,' including the JN Reddy Medal. He has been responsible for various national and international research contracts. Due to his international reputation, Carrera has held Invited plenary talks in international conferences. Dr. Carrera serves as Associate Editor for many journals. He is founder and Editor-in-Chief of Advances in Aircraft and Spacecraft Science, Editor-in-Chief of Mechanics of Advanced Materials Structures and Section Editor of JSV.

He is Senior Member of AIAA and ASME. He has been elected National President of A.I.D.A.A. for 2018–2022. Professor Carrera is member of the Accademia delle Science di Torino, which was founded in 1757 by L. Lagrange. He is a member of International Academy of Astronautics (IAA) and the Academy de L'Air et l'Espace AAE. Professor Carrera has been Highly Cited Researchers (Top 100 Scientist) by Thompson Reuters in the two Sections: Engineering and Materials. He has been confirmed HiCI in 2015 in the Section Engineering. The only aerospace Engineering worldwide. Due to his scientific outcoming, Professor Carrera has been recently awarded by the President of Italian Republic, as "Honoray Commendator." It consists of one of the highest award in Italy and it has been given to only 73 Italian Scientists from 2003.

TRACK 8: ENERGY

TUESDAY, NOVEMBER 19
9:45AM-10:30AM
ROOM C123 CONVENTION CENTER

Guangdong Zhu
National Renewable Energy Laboratory

Presentation Title: A Bold Vision on Energy Decarbonization: From Concentrating Solar Power, Seasonal Storage, to Hybrid Energy Systems

Abstract: It is exciting, but challenging, to see many states, especially California, and federal agencies to lay out a target of 100% energy decarbonization in various scenarios in the United States. To achieve this demanding goal, it requires us to explore full potential of all renewable technologies, in addition to improving energy usage efficiency where possible. In this seminar, the speaker will share two examples of journeys in developing next generation concentrating solar power (CSP) technologies and geothermal energy storage (GeoTES) technologies with solar hybridization. CSP, naturally coupled with low-cost thermal energy storage, can offer valuable daily energy dispatching to the grid; GeoTES with solar hybridization has shown a potential to provide a unique low-cost seasonal storage solution without requiring any technical breakthrough. In particular, the speaker will elaborate on:

- A newly formed heliostat consortium (HelioCon) with $25M over 5 years. HelioCon integrates an international team and calls for participation of additional stakeholders from academia and industries and other research institutes, with an objective to advance heliostat technologies for high-performance and low-cost CSP technologies for electricity, through multiple rounds of requests for proposal (RFP) processes.
- A newly funded project in developing GeoTES with hybridization of CSP and heat pump by using geological reservoirs. With hybridization, depleted oil/gas reservoirs and low-temperature water reservoirs can be transformed into a high-temperature geothermal resource, with CSP heat or excess electricity from a grid dominated by non-flexible renewable technologies (such as PV and wind).

At the end, the speaker will share his vision on how to integrate academia and industrials to develop a unique platform of hybrid energy systems for research, development, and deployment and grow a world-class program to tackle most critical problems foreseen in the future 100% decarbonized energy infrastructure in US.

Biography: Dr. Guangdong Zhu has been a senior researcher since 2010 and, lately, the group manager of Thermal Energy Systems, at the National Renewable Energy Laboratory (NREL). The Thermal Energy Systems group is focused on concentrating solar power technologies, thermal energy storage, and renewable energy hybridization. At NREL, Guangdong has been leading research efforts related to solar collector development, linear Fresnel technology, seasonal storage, and renewable energy hybridization. He is the executive director of the newly formed 5-year $25M heliostat consortium co-led by NREL and Sandia National Labs, partnering with the Australian Solar Thermal Research Institute (ASTRI). He is the associate editor of ASME Solar Energy Engineering since 2023 and was the ASME Journal of Energy Resources Technology between 2019 and 2022. He has served as technical/general program chair for ASME Energy Sustainability international conference in 2017–2020. He won NREL's staff award for outstanding performance in 2021, President's award in 2016 and Outstanding New Partnership Award in 2016. He has published over 40 peer-reviewed journal/conference papers and given invited presentations at various research institutes. Dr. Zhu obtained his Ph.D. in mechanical engineering from the University of New Mexico in 2006.

MONDAY, NOVEMBER 18
9:15AM-10:00AM
ROOM B114, CONVENTION CENTER

Jianlin Li
Argonne National Laboratory

Presentation Title: Electrode Processing and Manufacturing for Lithium-Ion Batteries

Abstract: The demand for lithium-ion batteries is ever-increasing with their applications to electrical vehicles and grid storage. Electrode processing and manufacturing plays an essential role in manufacturing cost and performance of lithium-ion batteries. This presentation will share several processes in fabricating electrodes and highlight their impact on energy consumption, manufacturing cost, electrode properties, and electrochemical performance.

Biography: Dr. Jianlin Li is the Energy Storage and Conversion department manager in the Applied Materials division. Jianlin's research area includes materials synthesis, processing and characterization, electrode engineering, cell manufacturing, and prototyping for energy storage and conversion. He received bachelor's degrees in Materials Chemistry and Electronic Information Engineering and a master's degree in Materials Science from the University of Science and Technology of China. Jianlin received his doctorate in Materials Science and Engineering from the University of Florida and was most recently a senior R&D staff member and leader of the Energy Storage and Conversion Manufacturing Group at Oak Ridge National Laboratory. Prior to joining Argonne, he spent almost 14 years at Oak Ridge National Laboratory where he was the leader of the Energy Storage and Conversion Manufacturing Group. He was among a small team to establish the Battery Manufacturing Facility (BMF) at ORNL in 2012. Jianlin is also the recipient of several prestigious awards, including the 2023 UT-Battelle Outstanding Research Output team award, 2021 UT-Battelle Research Accomplishment individual award, three R&D 100 awards, and two Federal Laboratory Consortium awards. He holds more than 35 patents and patent applications with 7 licensed, has authored more than 170 refereed journal articles and 11 book chapters, and edited one book.

TRACK 9: ENGINEERING EDUCATION

THURSDAY, NOVEMBER 21
9:00-9:45AM
ROOM A106, CONVENTION CENTER

Salvador Orara, MFA
Willamette University

Presentation Title: Complex, Uncertain, Volatile, and Ambiguous: Why Engineering Programs Should Consider Integrating Humane-Centered Design into Their Curriculum

Abstract: In an era characterized as volatile, uncertain, complex, and ambiguous (VUCA), the imperative to incorporate design thinking and humane-centered design (HCD) into engineering programs becomes evident. As traditionally structured, engineering education often falls short of preparing students to navigate the intricate and unpredictable challenges of the contemporary world. Acknowledging the VUCA context underscores the inadequacies of conventional approaches that prioritize technical skills at the expense of a holistic understanding of real-world problems, the systems these problems reside, and the human and non-human stakeholders impacted by them. Humane-centered design has emerged as a transformative framework. By placing the experience or all living things at the core of problem-solving, HCD introduces a nuanced perspective that extends beyond technical proficiency. It encourages empathy, collaboration, and a deep understanding of the diverse needs and contexts of everyone and everything. This approach not only equips engineers with the ability to address complex problems but also ensures that solutions resonate with the intended beneficiaries and the expanding intricacies of the complex ecosystems they engender. Embracing humane-centered design is not just an enhancement but a necessity for engineering programs aiming to produce graduates capable of thriving in a world characterized by constant change and unpredictability. The synthesis of these elements—the recognition of VUCA, the critique of conventional engineering education, and the advocacy for HCD—shapes a compelling narrative urging a holistic transformation in how engineers are educated. The speaker will share their experiences conceiving and implementing an academic minor on innovation through humane-centered design, critical making, and design ethnography. This initiative took place within the context of a Catholic liberal arts institution, serving interdisciplinary cohorts that spanned engineering, business, nursing, education, and the liberal arts. The presentation will be driven by critiques that frame nursing, engineering, and entrepreneurship case studies.

Biography: Salvador Orara is a designer, educator, and creative technologist who recently served as the Innovation Professor of Practice and Director of Innovation Programs at the University of Portland. Prior to joining UP, he was the Lead User Experience Strategist and Product

Owner at Jaguar Land Rover. His 20+ year career boasts experiences as a contractor, consultant, researcher, academic, and entrepreneur. He specializes in design studies, exploring the impact of design-centered frameworks within teams and organizations and the instigation of change within industry contexts and academic curricula. In the academic domain, his work has shaped programs at Woodbury University, Art Center College of Design, Pacific Northwest College of Art, and the University of Portland. Salvador received his Master's in Fine Art in Media Design Practices from Art Center College of Design in Pasadena, CA., and a Bachelor's in Fine Art in Graphic Design from the University of the Arts in Philadelphia, PA. He was President of the AIGA Portland Chapter and founder of The Rare Studio. His work has been published by Routledge, the Western Institute of Nursing, and IEEE. His current research focuses on design studies within liberal arts programs, the impact of futuring and foresight methods on first-generation students, and developing tools and design-centered frameworks for problem-solving within non-design curricula such as nursing, entrepreneurship, and engineering.

TRACK 10: FLUIDS ENGINEERING

THURSDAY, NOVEMBER 21
9:00-9:45AM
ROOM B113, CONVENTION CENTER

Prof. Lucy Zhang
Rensselaer Polytechnic Institute (RPI

Title: Modeling and simulations of fluid-structure interactions in engineering applications

Abstract: Fluid-structure interaction (FSI) is a critical phenomenon in many natural and engineered systems. FSI is governed by complex, coupled physical equations that account for the dynamics of both fluid mechanics and solid mechanics. The mathematical modeling of FSI requires solving the Navier-Stokes equation for the fluid domain and the equations of elasticity for the solid domain. Advances in CFD and finite element methods have enabled accurate simulations of FSI, facilitating better understanding in many natural systems and better designs in engineering applications. In this talk, I will discuss computational strategies for simulating fluid-structure problems, including the immersed methods. Immersed methods allow for multiple discretized meshes to co-exist and overlap within one computational domain. It also provides the versatility in coupling multiple solvers that govern different physics. Additional computational capabilities such as uncertain quantifications on complex systems can be easily applied, enhancing the analysis of complex problems. I will demonstrate these methods through examples in several shock physics and biomedical applications, while also addressing the remaining challenges in this field.

Bio: Prof. Lucy Zhang is a Professor in the Department of Mechanical, Aerospace & Nuclear Engineering and Associate Dean for Research Innovations, Partnerships, and Workforce Development at Rensselaer Polytechnic Institute (RPI). She is a Fellow of ASME. She received her B.S. from Binghamton University in December of 1997, obtained her M.S. and Ph.D. from Northwestern University, IL, respectively. She joined Mechanical Engineering Department at Tulane as an assistant professor. Due to Hurricane Katrina, she moved to Rensselaer Polytechnic Institute in 2006 and was later promoted to Associate Professor and Professor. Her research interests are building advanced and robust computational tools and software for accurate and efficient multiphysics and multiscale simulations that can be used for engineering applications in biomechanics, micro and nano-mechanics, medicine, and defense projects. She recently completed serving as a Program Director in the Mechanics cluster: Mechanics of Materials and Structures (MoMS) and Biomechanics & Mechanobiology (BMMB) programs within the CMMI Division at NSF. She is also the co-host of "This Academic Life" podcast series.

TRACK 11: HEAT TRANSFER & THERMAL ENGINEERING

MONDAY, NOVEMBER 18
9:15AM-10:00AM
ROOM B116, CONVENTION CENTER

Huijuan Dai
DOE

Presentation Title: Advanced Materials and Manufacturing Innovations for America's Clean Energy Future

Abstract: The U.S. Department of Energy's Advanced Materials and Manufacturing Technologies Office (AMMTO) is dedicated to pioneering research, development, and demonstration of cutting-edge materials and manufacturing processes. These endeavors are essential not only for catalyzing economy-wide decarbonization efforts but also for enhancing U.S. industrial competitiveness. By aligning with the national strategy to rejuvenate American manufacturing, fortify critical supply chains, and cultivate diverse innovation ecosystems, AMMTO is at the forefront of creating new manufacturing opportunities and bolstering the economic resilience of the nation. This presentation offers an overview of the AMMTO office and highlights the array of federal funding opportunities it offers. Delving deeper, the discussion will focus on pivotal technology areas, particularly in the realm of heat transfer and thermal management. Emphasis will be placed on advanced high-performance materials engineered for demanding high-temperature applications, as well as the innovative research on Conductivity-enhanced materials for Affordable, Breakthrough, Leapfrog Electric, and thermal applications (CABLE).

Join us as we explore the transformative potential of these advancements, illuminating pathways toward sustainable manufacturing, energy efficiency, and economic prosperity.

Biography: Huijuan Dai, Ph.D., leads the Next Generation Materials and Processes program (NGMP) in the Advanced Materials & Manufacturing Technologies Office (AMMTO) at the U.S. Department of Energy. Her portfolio includes smart manufacturing, cyber security for manufacturing, high performance computing, advanced processes including additive manufacturing, composites, conductivity enhanced materials, and harsh environment materials. Three Manufacturing USA institutes are under Huijuan's portfolio, including the Institute for Advanced Composites Manufacturing Innovation (IACMI), Clean Energy Smart Manufacturing Innovation Institute (CESMII), and Cybersecurity Manufacturing Innovation Institute (CyManII). Before joining DOE, Huijuan spent more than 15 years working on industry research and technology development across aerospace and energy industries. She has more than 10 years of experience in program and team management, leading multidisciplinary teams from idea generation to new technology introduction.

TUESDAY, NOVEMBER 19
9:45AM-10:30AM
ROOM B113, CONVENTION CENTER

Ravi Prasher
Bloom Energy

Presentation Title: Thermo-Electro-Chemical Science & Engineering

Abstract: Ions have traditionally been explored to manipulate energy processes in material science, chemical, and electrical engineering for technologies such as batteries, capacitors, and fuel cells. In this talk, I will discuss how ions can be used to manipulate thermal properties and how thermal properties can be used to characterize electrochemical systems. To illustrate these ideas, I will discuss the newly invented Ionocaloric refrigeration cycle, operando measurement of electrochemical properties using thermal wave sensing, and finally use of heat to increase the efficiency of high temperature solid oxide electrolysis for hydrogen production.

Biography: Ravi Prasher is the Chief Technology Officer of Bloom Energy. He also serves as an adjunct professor in the Department of Mechanical Engineering at UC Berkeley where he advises Ph.D. candidates. Prior to joining Bloom Energy, Ravi was the Associate Lab Director of Energy Technology Area at Lawrence Berkeley National Laboratory (LBNL). His responsibilities included managing research and development in a wide variety of areas, including fuel cells, hydrogen production, storage and transport, electrochemical and thermal storage, carbon capture, microgrids, and renewable energy among others. He was also a Senior Scientist at LBNL where he conducted research in thermal science and engineering. Postdocs from his research group have joined multiple universities worldwide as faculty members. He served as Vice President of Product Development for Shetak Inc., a startup developing thermoelectric energy converters. Ravi's experience includes being one of the first program directors at U.S. DOE's high-risk high-reward funding agency, ARPA-E, and serving as the technology development manager of Intel's thermal management group. Ravi has published more than 125 archival papers in top science and engineering journals and holds more than 35 patents. He is a fellow of ASME, a senior member of IEEE, and was elected to the National Academy of Engineering in February 2024. Ravi obtained his B.Tech. from IIT Delhi and Ph.D. from Arizona State University.

TRACK 12: MECHANICS OF SOLIDS, STRUCTURES, & FLUIDS

TUESDAY, NOVEMBER 19
9:45AM-10:30AM
ROOM B116, CONVENTION CENTER

Nancy R. Sottos
University of Illinois Urbana Champaign

Sponsor: Applied Mechanics Division

Presentation Title: Molecularly Architected Polymers Enabled by Frontal Polymerization

Abstract: Materials with hierarchical architectures that combine soft and hard material domains with coalesced interfaces possess superior properties compared to their homogeneous counterparts. This talk describes the control of material properties through morphogenic pattern formation during frontal polymerization of polycyclooctadiene (pCOD). Tuning of the reaction kinetics and thermal transport gives rise to spin mode instabilities and the formation of amorphous and semi-crystalline domains emerging from the internal interfaces generated between the solid polymer and the propagating cure front. The size, spacing, and arrangement of the domains are controlled by the interplay between the reaction kinetics, thermodynamics, and boundary conditions. Small perturbations in the boundary conditions and resin formulation lead to significant changes in the tensile strength, elastic modulus, and toughness of molecularly architected polymers for three different initiators at similar heat of fusion. This ability to control mechanical properties and performance solely through the initial conditions represents a significant advancement in the design and manufacturing of advanced multiscale materials.

Biography: Nancy Sottos holds the Maybelle Leland Swanlund Endowed Chair and is Head of the Department of Materials Science and Engineering at the University of Illinois Urbana Champaign. She is leader of the Autonomous Materials Systems (AMS) group at the Beckman Institute for Advanced Science and Technology and director of the University of Illinois spoke of the BP International Center for Advanced Materials. Sottos is also a co-founder of the start-up companies Autonomous Materials Inc. (AMI) and RapiCure Solutions. The Sottos group develops polymers and composites capable of self-healing and regeneration, self-reporting, and self-protection to improve reliability and extend material lifetime. Her current research interests focus on circular additive and morphogenic manufacturing strategies for polymeric and composite materials with programmed end of life. She is a member of the National Academy of Engineering, the National Academy of Sciences, and the American Academy of Arts and Sciences. She is also a Fellow of the Society for Experimental Mechanics, the Society for Engineering Science, and the American Association for the Advancement of Science.

THURSDAY, NOVEMBER 21
9:00-9:45AM
ROOM B116, CONVENTION CENTER

Arun Shukla
University of Rhode Island

Sponsor: Applied Mechanics Division

Presentation Title: Structural Response Under Extreme Underwater Loadings

Abstract: Underwater explosions and implosions are inherently complex and unique physical phenomena markedly distinct from those occurring above the surface. This distinctiveness is primarily attributed to the incompressible nature of water, which fundamentally alters the propagation and impact of shock and pressure waves. The lecture will focus on experimental investigations to study the shock loading and fluid-to-structure interaction between the gas bubble generated by an underwater explosion (UNDEX) and a nearby rigid and flexible plate. Experiments are performed by clamping plates to a support structure that is either air backed or water backed. Though the shockwave produced by the initial detonation of an explosive can be a great source of damage during an UNDEX event, the resulting gas bubble's collapse can be an even greater source of damage. Results show that the explosive standoff distance, plate rigidity, and hydrostatic pressure can greatly change the bubble's shape, size, migration speed, migration direction, jetting behavior, and damage to the nearby plate. The UNDEX bubble's collapse and concurrent bubble jetting are shown to be the primary causes of plate damage, including rupture, for the dimensionless standoff parameters studied. Experiments are also performed to investigate sympathetic implosions and interaction of an imploding cylinder with a nearby structure. State-of-the-art pressure vessel facilities are used to study the implosion process. These pressure vessels are outfitted with several windows to allow the use of the 3D Digital Image Correlation (DIC) technique. The pressure histories generated by the implosion event are captured from dynamic pressure transducers mounted close to the specimen in all the experiments. These pressure histories are then related to real time deformations and velocities occurring on the shells. High-speed images coupled with 3D-DIC technique are captured for better understanding of the deformation mechanisms and collapse modes of the structures during the experiments. The continuous evolution of this research area is essential for advancing maritime technology, ensuring the safety of undersea operations, and protecting marine environments from the adverse effects of extreme subaqueous loadings.

Biography: Dr. Shukla is the Simon Ostrach Professor of Mechanical Engineering at the University of Rhode Island (URI). He is also the co-founder and inaugural co-director of the National Institute for Undersea Vehicle Technology at URI. Dr. Shukla was elected to the European Academy of Sciences and Arts in 2011 and the Russian Academy of Engineering in 2015. He is a Fellow of the American Society of Mechanical Engineers, American Academy of Mechanics, Shock Wave Society (India), and the Society for Experimental Mechanics (SEM). He received the M.M. Frocht Award from SEM for "outstanding achievements as an educator in the field of experimental mechanics" and the B.J. Lazan Award from SEM for "outstanding technical contributions." In 2003, he served as the President of SEM and in 2011 delivered the prestigious Murray Lecture at SEM. He has served as the Technical Editor of Experimental Mechanics and currently serves on the Editorial Boards of key engineering journals. Dr. Shukla has received the Distinguished Alumnus Award from his alma mater, IIT Kanpur. In 2023, he received the prestigious Drucker Medal from the American Society for Mechanical Engineers and the Theocaris Award from the SEM. He has served as the Clark B. Millikan Visiting Professor of Aerospace at the California Institute of Technology, USA and as the Satish Dhawan Visiting Chair at the Indian Institute of Sciences, Bangalore India. He has also served as the chair of the ASME's Applied Mechanics Division, Executive Committee. Along with his many Ph.D. and M.S. students, he has published more than 450 papers in refereed journals and proceedings. Dr. Shukla has also authored and edited 10 books.

TRACK 13: MICRO- AND NANO-SYSTEMS ENGINEERING & PACKAGING

WEDNESDAY, NOVEMBER 20
8:00AM-8:45AM
ROOM B113, CONVENTION CENTER

Liwei Lin
UC Berkeley

Presentation Title: Intelligent Sensor/Actuator for Human-Machine Interfaces

Abstract: Leveraging from the core MEMS (Microelectromechanical Systems) technologies, my group has been working on micro/nano sensors and actuators toward practical applications for human-machine interfaces. In this talk, I will present 6 main research results. In the area of personalized health by wearable systems, a piezoelectric pulse detector is developed to sense human pulse for health monitoring following the concept of traditional Chinese Medicine practices. In the second area, I will discuss our efforts in using graphene to make a transistor for gas detection in cell phone applications. The third topic is the development of flexible mechanical actuators as haptic feedback functions in applications such as AR/VR and robotics. Fourth, I will discuss the development of piezoelectric micromachined ultrasonic transducers (pMUTs) with various applications, such as temperature, flow, blood pressure... In the fifth area, my group has been working on microfluidic devices and some of the biomedical applications will be introduced. The sixth topic is energy generation and storage systems, such as energy harvesters, supercapacitors, and batteries. Finally, I will also introduce some fun projects, such as an ultra-robust and fast moving piezoelectric robot similar to those of cockroaches.

Biography: Professor Liwei Lin is the James Marshall Wells Distinguished Professor at the Mechanical Engineering Department and Co-Director at Berkeley Sensor and Actuator Center (BSAC) at UC Berkeley. His research interests are in design, modeling, and fabrication of micro/nano structures; sensors and actuators; as well as mechanical issues in micro/nano systems including heat transfer, solid/fluid mechanics, and dynamics. Dr. Lin is the recipient of the 1998 NSF CAREER Award for research in MEMS Packaging and the 1999 ASME Journal of Heat Transfer best paper award for his work on micro scale bubble formation. He led the effort to establish the MEMS division in ASME and served as the founding Chairman of the Executive Committee from 2004~2005. He is an ASME Fellow and has 23 issued U.S. patents in MEMS. He was the general co-chair of the 24th IEEE international conference on Micro Electro Mechanical Systems at Cancun, Mexico. He serves as associate editor for Microsystems & Nanoengineering published by the Nature group.

TRACK 14: SAFETY ENGINEERING, RISK, AND RELIABILITY ANALYSIS

WEDNESDAY, NOVEMBER 20
8:00AM-8:45AM
ROOM B116, CONVENTION CENTER

Enrique López Droguett
University of California, Los Angeles

Sponsor: SERAD

Presentation Title: Quantum Computing for Risk and Reliability: Opportunities & Outlook

Abstract: Industry 4.0, combined with the Internet of Things (IoT), has ushered in the requirements of reliability and maintainability systems to predict physical asset's performance and aid in integrity management. State of the art monitoring systems now generate large amounts of multidimensional data. Moreover, customers are no longer requiring that their new asset investment be highly reliable; instead, they are requiring that their assets possess the capability to perform fault diagnostics and prognostics and provide alerts when components need to be intervened. With this new Big Data at the engineer's fingertips, more sophisticated methodologies to handle this data have been developed and expanded within the risk and reliability (R&R) field. Indeed, in the past decade, the availability of powerful computers and special-purpose information processors have led to the development and application of machine and deep learning models for the assessment of R&R of complex engineering systems (CES) that can identify multifaceted and subtle degradation patterns in monitoring data. In recent years, a new computing paradigm has gained momentum: quantum computing, which encompasses the use of quantum mechanical phenomena to perform computations. The power and flexibility of a quantum computer comes from the use of qubits that have the ability to be in a superposition state, or multiple states at once, and share entanglement with each other. By leveraging on these properties, quantum computers can perform operations that are difficult to achieve at scale in classical digital computers. This opens the door to new exciting opportunities for the design and performance assessment of complex engineering systems in general, and for the development of new quantum learning methods for R&R that might be able to recognize intricate interdependent scenarios and components as well as multilayered degradation patterns in CES from multidimensional monitoring data that classical machine learning approaches cannot. In this lecture, we discuss the main concepts underpinning quantum computing and its advantages, disadvantages, and potential impact on the risk and reliability assessment of CES. We present state-of-the-art quantum optimization, quantum inference, and machine learning algorithms for

developing predictive solutions for risk and reliability assessment of complex engineering systems. We then examine potential opportunities, limitations, and challenges for the future development and deployment of quantum computing based R&R solutions for complex engineering systems.

Biography: Dr. Enrique López Droguett is Professor in the Civil and Environmental Engineering Department and Director of the Center for Reliability Science and Engineering in the Garrick Institute for the Risk Sciences at the University of California, Los Angeles (UCLA). He is also Associate Editor for the Journal of Risk and Reliability and serves on the Board of Directors of the International Association for Probabilistic Safety Assessment and Management (IAPSAM). Prof. López Droguett conducts research on Bayesian inference and artificial intelligence supported digital twins and prognostics and health management based on physics informed deep learning for reliability, risk, and safety assessment of structural and mechanical systems. His most recent focus has been on quantum computing for developing predictive solutions for risk and reliability assessment of complex engineering systems. He has led many major studies on these topics for a broad range of industries, including oil and gas, nuclear energy, defense, civil aviation, mining, renewable and hydro energy production and distribution networks. Prof. López Droguett has authored more than 300 papers in archival journals and conference proceedings.

Program at a Glance

MONDAY, NOVEMBER 18			
ROOM	**10:20AM–12:05PM**	**1:40PM–3:25PM**	**3:45PM–5:30PM**
A103	01-01-01: Mechanical Metamaterials	01-02-01: Topological Phononics	01-02-02: Acoustic Metamaterials
A105	03-01-01: Annual Conference-Wide Symposium on Additive Manufacturing	03-01-02: Annual Conference-Wide Symposium on Additive Manufacturing	02-03-03: Optimization
A106	03-01-03: Annual Conference-Wide Symposium on Additive	03-01-04: Annual Conference-Wide Symposium on Additive Manufacturing	03-01-05: Annual Conference-Wide Symposium on Additive Manufacturing
A107	01-04-01: Congress-Wide Symposium on NDE & SHM: Ultrasonic Waves for Material Characterization and Damage Assessment	01-04-01: Congress-Wide Symposium on NDE & SHM: Ultrasonic Waves for Material Characterization and Damage Assessment	01-08-01: Passive, Semi-Active, and Active Noise and Vibration Control
A108	02-01-01: Product and Process Design	02-01-02: Product and Process Design	02-07-01: IoT and Digital Twins
A109	03-01-06: Annual Conference-Wide Symposium on Additive Manufacturing	03-01-08: Advanced Manufacturing Processes & Characterization	03-01-07: Annual Conference-Wide Symposium on Additive Manufacturing
B110	04-11-01: Advanced Materials Processing and Property Characterization	04-11-02: Advanced Materials Processing and Property Characterization	04-11-03: Advanced Materials Processing and Property Characterization
B111	04-19-01: Towards Understanding Plasticity, Damage, and Fracture in Materials Across Different Length Scales and Environments: A Materials Division Symposium Honoring Eliot Fang	04-19-02: Towards Understanding Plasticity, Damage, and Fracture in Materials Across Different Length Scales and Environments: A Materials Division Symposium Honoring Eliot Fang	04-19-03: Towards Understanding Plasticity, Damage, and Fracture in Materials Across Different Length Scales and Environments: A Materials Division Symposium Honoring Eliot Fang
B112	04-02-01: Modeling, Simulation, and Design of Multifunctional Materials	04-02-02: Modeling, Simulation, and Design of Multifunctional Materials	04-01-01: Advanced Materials for Energy
B113	11-15-01: Heat Transfer in Electronic Equipment	11-15-02: Heat Transfer in Electronic Equipment	11-12-01: Advances in Combustion Science and Gas Turbine Heat Transfer for Reduced Environmental Impact
B114	11-05-01: Thermophysical Properties: Characterization and Modeling Across Scales	11-05-02: Thermophysical Properties: Characterization and Modeling Across Scales	11-01-01: Additive Manufacturing: Heat Transfer Processes and Thermal and Energy System
B115	06-01-01: Injury and Damage Biomechanics I - Organ and Tissue Injury Biomechanics 1	06-01-02: Injury and Damage Biomechanics II - Organ and Tissue Injury Biomechanics 2	06-02-01: Vibration and Acoustics in Biomedical Applications

MONDAY, NOVEMBER 18			
ROOM	**10:20AM–12:05PM**	**1:40PM–3:25PM**	**3:45PM–5:30PM**
B116	12-27-01: Advances in the Mechanics of Architected Materials	12-23-01: Symposium on Multiphysics Simulations and Experiments for Solids	12-23-02: Symposium on Multiphysics Simulations and Experiments for Solids
B117	06-07-01: Biotransport (Fluid, Heat, and Mass)	06-08-01: Computational Modeling in Biomedical Applications	06-08-02: Computational Modeling in Biomedical Applications
B118	08-20-01: Hydrogen Production, Storage, and Integrated Hydrogen Energy Systems	08-20-02: Hydrogen Production, Storage, and Integrated Hydrogen Energy Systems	08-01-01: Environmental Impact of Energy Systems, Components Optimization, and AI for Energy Systems
B119	11-13-01: Aerospace Heat Transfer	08-03-01: Sustainable Heating/ Cooling Systems	08-04-01: Fundamentals and Applications of Thermodynamics
C120	12-24-01: Friction, Fracture, and Damage	12-04-01: Drucker Medal Symposium	12-04-02: Drucker Medal Symposium
C121	02-03-01: Optimization	02-03-02: Optimization	03-01-09: Advanced Material Joining and Metal Forming
C122	03-02-01: Congress-Wide Symposium on NDE & SHM: Measurement Science, Sensors, Non-destructive Evaluation (NDE), and Process Monitoring and Control for Advanced Manufacturing	03-03-01: Nanomanufacturing: Novel Processes, Applications, and Process-Property Relationships	04-04-01: Dynamics of Advanced Functional Materials and Structures
C123	08-05-01: Energy-Related Multidisciplinary I	08-05-02: Energy-Related Multidisciplinary II	08-05-03: Energy-Related Multidisciplinary III
C125	01-06-01: New Advances in Acoustics and Vibration: AI and Machine Learning, New Methods and Materials	01-05-01: Congress-Wide Symposium on NDE & SHM: Computational Nondestructive Evaluation and Structural Health Monitoring	01-06-02: New Advances in Acoustics and Vibration: AI and Machine Learning, New Methods and Materials
D133	06-11-01: Biotechnology and General Applications	01-01-02: Mechanical Metamaterials	Hydrogen Risk and Reliability Analysis
D134	12-05-01: Functional Origami and Kirigami-inspired Structures and Materials	12-05-02: Functional Origami and Kirigami-inspired Structures and Materials	12-29-04: Mechanics of Soft Materials
D135	12-29-01: Mechanics of Soft Materials		12-29-03: Mechanics of Soft Materials
D137	08-05-06: Energy-Related Multidisciplinary VI	12-29-02: Mechanics of Soft Materials	

TUESDAY, NOVEMBER 19			
ROOM	**10:45AM–12:30PM**	**3:00PM–4:45PM**	**5:00PM–6:45PM**
A103	01-02-03: Phononic Crystals and Metamaterials	01-02-04: Piezoelectric and Ferroelectric Phononics	01-02-05: Multidisciplinary Phononics
A105	03-04-01: Advanced Machining and Finishing Processes	03-04-02: Advanced Machining and Finishing Processes	03-06-01: Advanced Material Forming – Mechanism, Characterization, Novel Processes, and Control
A106	03-06-02: Advanced Material Forming – Mechanism, Characterization, Novel Processes, and Control	03-07-01: Data-Driven Smart Product Design and Manufacturing	03-08-01: Computational Modeling and Simulation for Advanced Manufacturing
A107	02-05-01: Data Driven Design	02-08-01: Advances in Human Modelling	02-09-01: Design for Healthcare Products and Processes
A108	02-06-01: eXtended Reality & Digital Design	02-04-01: Design for Additive Manufacturing & Sustainability	02-10-01: Sustainable Design
A109	03-08-02: Computational Modeling and Simulation for Advanced Manufacturing	03-08-03: Computational Modeling and Simulation for Advanced Manufacturing	03-08-04: Computational Modeling and Simulation for Advanced Manufacturing
B110	04-11-04: Advanced Materials Processing and Property Characterization	04-11-05: Advanced Materials Processing and Property Characterization	04-18-01: Student Symposium for the Materials Division
B111	04-19-04: Towards Understanding Plasticity, Damage, and Fracture in Materials Across Different Length Scales and Environments: A Materials Division Symposium Honoring Eliot Fang	04-19-05: Towards Understanding Plasticity, Damage, and Fracture in Materials Across Different Length Scales and Environments: A Materials Division Symposium Honoring Eliot Fang	04-06-01: Electrochemo-Mechanics of Energy Materials and Structure-Processing-Property Relationship of Hybrid Organic-Inorganic Materials for Energy Applications
B112	04-19-04: Towards Understanding Plasticity, Damage, and Fracture in Materials Across Different Length Scales and Environments: A Materials Division Symposium Honoring Eliot Fang	04-13-02: Material Processing of Flexible/Emerging Electronics, Sensors, and Devices	04-08-01: Printed Hybrid Multifunctional Electronics and Energy Devices
B113	08-05-05: Energy-Related Multidisciplinary V	08-07-01: Green Buildings: Zero Carbon and Energy Technologies for Buildings	08-10-01: Innovations in Storage, Recovery and Upgrade of Thermal Energy
B114	08-08-01: Design Analysis and Optimization of Energy Conversion Systems - 1	08-08-02: Design Analysis and Optimization of Energy Conversion Systems - 2	08-12-01: Electrochemical Energy Storage and Conversion System

TUESDAY, NOVEMBER 19			
ROOM	**10:45AM–12:30PM**	**3:00PM–4:45PM**	**5:00PM–6:45PM**
B115	08-08-01: Design Analysis and Optimization of Energy Conversion Systems - 1	06-01-04: Injury and Damage Biomechanics IV - Head, Neck and Brain Injuries	06-08-03: Computational Modeling in Biomedical Applications
B116	08-08-01: Design Analysis and Optimization of Energy Conversion Systems - 1	10-08-01: Multiphase Flows and Applications	10-08-02: Multiphase Flows and Applications
B117	06-05-01: Biomedical Devices, Sensors, and Actuators	06-05-02: Biomedical Devices, Sensors, and Actuators	06-05-03: Biomedical Devices, Sensors, and Actuators
B118	07-01-01: General Dynamics, Vibration, and Control	07-01-02: General Dynamics, Vibration, and Control	07-04-01: Fluid-Structure Interaction - Powertrain Dynamics for Electric Vehicle Propulsion
B119	07-01-01: General Dynamics, Vibration, and Control	07-03-02: Design and Control of Robots, Mechanisms and Structures II	07-03-03: Design and Control of Robots, Mechanisms and Structures III
C120	11-09-01: Phase-Change Processes: Fundamentals and Application	11-09-02: Phase-Change Processes: Fundamentals and Applications	11-09-03: Phase-Change Processes: Fundamentals and Applications
C121	12-09-01: Instabilities in Solids and Structures	12-09-02: Instabilities in Solids and Structures	12-12-04: Modeling of the Fracture, Failure, and Fatigue in Solids
C122	12-12-01: Modeling of the Fracture, Failure, and Fatigue in Solids	12-12-02: Modeling of the Fracture, Failure, and Fatigue in Solids	12-12-03: Modeling of the Fracture, Failure, and Fatigue in Solids
C123	18-01-01: Emerging Trends in the Space Industry	18-01-02: AI Implementation in Industry - I	01-03-01: General
C125	12-28-01: Functional Soft Composites - Design, Mechanics, and Manufacturing	12-28-02: Functional Soft Composites - Design, Mechanics, and Manufacturing	12-26-01: Mechanics and Materials of Soft Electronics
D133	11-05-03: Thermophysical Properties: Characterization and Modeling Across Scales	04-15-01: Nanoengineered, Nano Modified, Hierarchical, Multi-Scale Materials and Structures	11-03-01: Artificial Intelligence, Machine Learning and Data Science for Thermal Processes, Heat Transfer and Energy Systems
D134	10-06-01: Fluid Measurements and Instrumentation	10-01-01: DNS, LES and Hybrid-RANS/LES Methods for CFD	10-09-01: Industrial Flows
D135	06-11-03: Biotechnology and General Applications	07-08-02: Multibody Dynamic Systems and Applications II	07-08-03: Multibody Dynamic Systems and Applications III
D137	07-08-01: Multibody Dynamic Systems and Applications I	08-12-02: Electrochemical Energy Storage and Conversion System	04-19-06: Towards Understanding Plasticity, Damage, and Fracture in Materials Across Different Length Scales and Environments: A Materials Division Symposium Honoring Eliot Fang

WEDNESDAY, NOVEMBER 20			
ROOM	**9:05AM–10:50AM**	**2:00PM–3:45PM**	**4:05PM–5:50PM**
A103	04-19-06: Towards Understanding Plasticity, Damage, and Fracture in Materials Across Different Length Scales and Environments: A Materials Division Symposium Honoring Eliot Fang	03-09-02: Robotics and Automation in Advanced Manufacturing	03-10-01: Laser-Based Advanced Manufacturing and Materials Processing
A105	04-14-01: Modeling and Experiments of Materials Subject to Ballistic, Blast, and High-Strain-Rate Events	04-14-02: Modeling and Experiments of Materials Subject to Ballistic, Blast, and High-Strain-Rate Events	04-14-03: Modeling and Experiments of Materials Subject to Ballistic, Blast, and High-Strain-Rate Events
A106	04-20-01: Design of Engineered Materials and Components for Additive Manufacturing	04-22-01: Design of Engineering Materials	04-24-01: Advancing Composite Materials through Integrated Multiscale Modeling and Experimental Techniques
A107	03-10-02: Laser-Based Advanced Manufacturing and Materials Processing	03-15-01: Cold Spray & Solid-State Additive Manufacturing	03-15-02: Cold Spray & Solid-State Additive Manufacturing
A108	03-15-03: Cold Spray & Solid-State Additive Manufacturing	03-12-01: Conference-Wide Symposium on Biomanufacturing & Biomaterials	04-23-01: Functional Soft Composites - Design, Mechanics, and Manufacturing
A109	04-25-01: Thin-Film Materials/ Electronics for Advanced Biochemical and Biophysical Sensing	04-26-01: Advanced Material Innovations in Wearable Biomedical Devices and Structures	04-29-01: Multifunctional Composite/Safety Materials
B110	04-28-01: Bioinspired Materials, Structures and Applications	05-16-01: Applications of Artificial Intelligence/Machine Learning in Aerospace Engineering	05-16-02: Applications of Artificial Intelligence/Machine Learning in Aerospace Engineering
B111	06-10-01: Robotics, Rehabilitation	06-11-02: Biotechnology and General Applications	06-04-01: Biomaterials and Tissue: Modelling, Fabrication and Characterization
B112	06-08-04: Computational Modeling in Biomedical Applications	06-09-01: Musculoskeletal and Sports Biomechanics	06-10-02: Robotics, Rehabilitation

WEDNESDAY, NOVEMBER 20			
ROOM	**9:05AM–10:50AM**	**2:00PM–3:45PM**	**4:05PM–5:50PM**
B113	09-10-01: Teaching Laboratories, Hands-on lab Experiences, Online Laboratory Teaching, Virtual Lab Simulation, Use of AI in Laboratory Experiments, Laboratory Equipment, Laboratory Safety Practices, Technology-Aided Lecturing, Novel Manufacturing Proc	09-10-02: Teaching Laboratories, Hands-on lab Experiences, Online Laboratory Teaching, Virtual Lab Simulation, Use of AI in Laboratory Experiments, Laboratory Equipment, Laboratory Safety Practices, Technology-Aided Lecturing, Novel Manufacturing Proc	09-01-04: Curriculum Innovations, Pedagogy and Learning Methodologies
B114	09-01-05: Curriculum Innovations, Pedagogy and Learning Methodologies, Globalization of Engineering and Engineering Accreditation	10-02-02: CFD Applications for Optimization and Control	10-02-03: CFD Applications for Optimization and Control
B115	07-01-03: General Dynamics, Vibration, and Control	07-01-04: General Dynamics, Vibration, and Control	07-10-01: Mobile Robots and Unmanned Ground Vehicles
B116	10-06-02: Fluid Measurements and Instrumentation	10-04-01: Young Engineer Paper (YEP) Contest Fluids Engineering Division	10-09-02: Industrial Flows
B117	07-17-01: Machine Learning and Artificial Intelligence in Dynamics, Vibrations and Control	07-17-02: Machine Learning and Artificial Intelligence in Dynamics, Vibrations and Control	07-17-03: Machine Learning and Artificial Intelligence in Dynamics, Vibrations and Control
B118	08-08-03: Design Analysis and Optimization of Energy Conversion Systems - 3	08-08-04: Design Analysis and Optimization of Energy Conversion Systems - 4	08-09-01: Multi-Energy Systems
B119	08-21-01: Batteries and Fuel Cells for Electric Vehicles	08-21-02: Batteries and Fuel Cells for Electric Vehicles and Electric Vehicle Batteries as Multifunctional Energy Storages	09-10-03: Teaching Laboratories, Hands-on lab Experiences, Online Laboratory Teaching, Virtual Lab Simulation, Use of AI in Laboratory Experiments, Laboratory Equipment, Laboratory Safety Practices, Technology-Aided Lecturing, Novel Manufacturing Proc
C120	11-02-01: Heat and Mass Transfer in Energy Production and Energy Storage Systems	12-11-01: Scientific Machine Learning and Uncertainty Quantification Methods for Experimental Mechanics	12-11-02: Scientific Machine Learning and Uncertainty Quantification Methods for Experimental Mechanics
C121	12-02-02: Advances in Experimental Mechanics	12-02-01: Advances in Experimental Mechanics	12-08-01: Data-Enabled Predictive Modeling, Scientific Machine Learning, and Uncertainty Quantification in Computational Mechanics

WEDNESDAY, NOVEMBER 20			
ROOM	**9:05AM–10:50AM**	**2:00PM–3:45PM**	**4:05PM–5:50PM**
C122	12-03-02: General: Mechanics of Solids, Structures and Fluids	13-02-01: Design and Fabrication, Analysis, Processes, and Technology for Micro and Nano Devices and Systems	13-03-01: Computational Studies on MEMS and Nanostructures
C123	18-01-03: AI Implementation in Industry - II	18-01-04: Sustainability in Industry	18-01-05: Conventional Manufacturing
C125	14-01-01: General Topics on Risk, Safety, and Reliability I	14-04-01: Reliability and Safety in Transportation Systems I	14-06-01: Machine Learning and Deep Learning in Safety, Reliability, and Maintenance I
D133	05-02-01: Advances in Aerodynamics and Aerospace Propulsion Systems	09-04-01: Sustainability, Efficiency, Competencies for Industry 4.0 and Industry 5.0, Learning Factories, Ethical Dimensions, Safety and Complexity Issues	09-08-01: Distance/Online Engineering Education, Models and Enabling Technologies
D134	11-10-01: Radiative Heat Transfer Across Scales	11-10-02: Radiative Heat Transfer Across Scales	11-10-03: Radiative Heat Transfer Across Scales
D135	13-07-01: Packaging Technology in Heterogeneous Integration Applications	13-06-01: Applied Mechanics and Materials in Micro- and Nano-Systems	07-12-02: Optimization, Uncertainty and Probability
D137	07-12-01: Optimization, Uncertainty and Probability	05-04-01: Advances in Aerospace Structures and Materials	08-05-04: Energy-Related Multidisciplinary IV

THURSDAY, NOVEMBER 21			
ROOM	**10:05AM–11:50PM**	**1:45PM–3:30PM**	**3:45PM–5:30PM**
A103	08-05-04: Energy-Related Multidisciplinary IV	03-11-02: Future of Smart Manufacturing	03-16-01: AI Integration in Mechanical Engineering and Smart Manufacturing
A105	07-02-01: Nonlinear Dynamics, Control, and Stochastic Mechanics	07-02-02: Nonlinear Dynamics, Control, and Stochastic Mechanics	07-21-01: Advances in Rotor Dynamics
A106	07-09-01: Vibrations of Continuous Systems	07-15-01: Dynamics and Control of Soft Structures	09-01-01: Curriculum Innovations, Pedagogy and Learning Methodologies
A107	03-16-02: AI Integration in Mechanical Engineering and Smart Manufacturing	03-19-01: Design and Manufacturing of Robotic and Mechatronic Systems	03-20-01: Manufacturing: General
A108	05-05-01: Beam, Plate, Shell, and Layered Structures	05-11-01: Multifunctional Composites and Structures: Mechanics, Modeling, and Space Applications	07-07-01: Novel Control of Dynamic System and Design
A109	09-01-02: Curriculum Innovations, Pedagogy and Learning Methodologies	09-06-01: Fluid Mechanics, Machine Learning and Predictive Simulations in Fluid Flows, Aerospace Systems, Thermodynamics, Heat Transfer, Energy Systems, Fluid Power and pneumatic systems, and Renewable Energy Applications	09-05-01: Applied Mechanics, Dynamic Systems, Experimental and Computational Methods, Modeling and Virtual Simulations of Dynamic Structures, Advanced Materials and Testing
B110	09-12-01: Mechatronics, Robotics, Automation, Automotive, Power Electronic, Control Engineering, Packaging, Automated Storage and Retrieval, Cybersecurity in Industry, Artificial Intelligence and Machine Learning	09-11-01: Engineering Research Innovation and Research Experiences for Graduate and Undergraduates Students	09-01-03: Curriculum Innovations, Pedagogy and Learning Methodologies
B111	10-02-04: CFD Applications for Optimization and Control	10-03-01: 30th Symposium on Fundamental Issues and Perspectives in Fluid Mechanics	10-02-05: CFD Applications for Optimization and Control
B112	11-10-04: Radiative Heat Transfer Across Scales	11-07-01: Transport Properties of Energy Carriers	11-07-02: Transport Properties of Energy Carriers
B113	13-10-01: Micro/Nanofluidics 2024	13-09-01: Advanced Manufacturing of Microsystems, Microstructures, and Miniaturized Actuators	13-04-01: Applications of Micro and Nano Systems in Medicine and Biology
B114	13-05-01: Micro and Nano Devices	13-13-01: Simulations of Material Modeling and Behavior Analysis for MEMS Applications	14-02: Applications and Reliability of Sensors

THURSDAY, NOVEMBER 21			
ROOM	**10:05AM–11:50PM**	**1:45PM–3:30PM**	**3:45PM–5:30PM**
B115	11-19-01: Methods in Computational Heat Transfer and Their Applications	11-19-02: Methods in Computational Heat Transfer and Their Applications	11-16-01: Waste Thermal Energy Recovery, Storage and Valorization at Broad Temperatures
B116	14-01-02: General Topics on Risk, Safety, and Reliability II	14-03: Reliability and Safety in Industrial Automation and Robotic Systems	
B117	12-15-01: Advances in Neural Operators for Scientific Machine Learning	12-10-01: Advancements of Data-Driven and Differentiable Computing in Solid Mechanics	12-10-02: Advancements of Data-Driven and Differentiable Computing in Solid Mechanics
B118	12-08-02: Data-Enabled Predictive Modeling, Scientific Machine Learning, and Uncertainty Quantification in Computational Mechanics	12-06-01: Scientific Machine Learning (SciML) for Characterization, Modeling, and Design of Structures and Materials	12-06-02: Scientific Machine Learning (SciML) for Characterization, Modeling, and Design of Structures and Materials
B119	12-20-01: Composite Materials and Mechanics	12-22-01: Multiscale Models and Experimental Techniques for Composite Materials and Structures	12-22-02: Multiscale Models and Experimental Techniques for Composite Materials and Structures
C120	12-20-01: Composite Materials and Mechanics	12-03-04: General: Mechanics of Solids, Structures and Fluids	12-03-05: General: Mechanics of Solids, Structures and Fluids
C121	05-01-01: General Aerospace	05-01-02: General Aerospace	05-01-03: General Aerospace
C122	07-19-01: Symposium on the Anniversary of the Timoshenko-Ehrenfest Beam Model and Other Refined Theories and Vibrations of Continuous Systems	07-20-01: Congress-Wide Symposium on NDE &SHM: Dynamics, Vibration, and Control for Structural Health Monitoring Applications	03-20-02: Manufacturing: General
C123			
C125	03-20-003-20-03: Manufacturing: General3: Manufacturing: General03-20-03: Manufacturing: General	07-20-01: Congress-Wide Symposium on NDE &SHM: Dynamics, Vibration, and Control for Structural Health Monitoring Applications	03-20-02: Manufacturing: General
D133	14-06-02: Machine Learning and Deep Learning in Safety, Reliability, and Maintenance II	14-05-01: Models and Methods for Probabilistic Risk Assessment	11-10-05: Radiative Heat Transfer Across Scales
D134	12-03-01: General: Mechanics of Solids, Structures and Fluids	10-05-01 Applications of Plasma and Magneto Flows	10-07-01 Micro- Nanosystem and Particulate Flows
D135	14-01-03: General Topics on Risk, Safety, and Reliability III	03-21-01: Undergraduate Capstone Presentations & Competition	14-04-02: Reliability and Safety in Transportation Systems II

Track Poster Listing

TRACK 15: IMECE UNDERGRADUATE RESEARCH AND DESIGN EXPOSITION

NOVEMBER 18TH

5:30PM–7:00PM - EXHIBIT HALL A

Track Organizer: Mohsen Ghamari, *Wilkes University*

U1. COMPARATIVE ANALYSIS OF SYNTHETIC FIBERS IN CEMENT-BASED COMPOSITES: IMPACT ON MECHANICAL PROPERTIES, {IMECE2024-146161}

Robabeh Jazaei - *Slippery Rock University of Pennsylvania*
Amina Tandukar - *Slippery Rock University*
Brayden Underwood - *Slippery Rock University*
Amber Maurer - *Slippery Rock University*

U2. DESIGN AND DEVELOPMENT OF FLOATING OFFSHORE WIND TURBINE AN, {IMECE2024-146935}

Hussain Abbas - *Hussain Abbas*

U3. INVESTIGATING CREEP BEHAVIOR AND SHORT-RANGE ORDERING IN HIGH-ENTROPY ALLOY: A DATA DRIVEN MOLECULAR DYNAMICS STUDY, {IMECE2024-144641}

Munirul Alam - *Bangladesh University of Engineering and Technology*
Afia Zaman - *Bangladesh University of Engineering and Technology*
Anik Shabab Soudha - *Bangladesh University of Engineering and Technology*

U4. A NOVEL ACTIVE LEARNING FRAMEWORK FOR DATA-DRIVEN DESIGN DATASETS, {IMECE2024-144594}

Advaith Narayanan - *Leigh High School*

U5. INVESTIGATION INTO THE OPTIMIZATION OF AIR-COOLED BATTERY THERMAL MANAGEMENT SYSTEMS FOR ELECTRIC VEHICLES, {IMECE2024-144926}

Mehmet Arik - *Auburn University*
Nicholas Bensman - *Auburn University*

U6. A WEB-BASED HOMOGENIZATION ENGINE BASED ON MICROGRAVITY DRIVEN MICROSTRUCTURE GENERATION FOR RANDOM UNIDIRECTIONAL COMPOSITES, {IMECE2024-140278}

Samuel Segal - *University of Virginia*
Heze Chen - *University of Virginia*
Marek-Jerzy Pindera - *Engineered Materials Concepts, LLC*

U7. DESIGN AND DEVELOPMENT OF AN INDUSTRIAL GRADE 3D PRINTER FOR ENHANCING PRECISION AND PRODUCTIVITY, {IMECE2024-142236}

Ragavanantham Shanmugam - *Fairmont State University*
Saquib Khan - *Mechanical Engineering (Maharaja Agrasen Institute of Technology)*
Pratyush Annamalai - *Curiosity 3D*

U8. DEVELOPMENT OF A SUPERHYDROPHOBIC CERAMIC COATING FOR APPLICATION IN PROTON EXCHANGE MEMBRANE FUEL CELLS, {IMECE2024-142399}

Gabriel Sayre - *western new england university*
Jason Chartier - *western new england university*
Trevor Relyea - *western new england*
Sebastian Manning - *western new england university*
Alexander Hartwell - *western new england university*

U9. AUTOMOATED DUAL-INTAKE AIR QUALITY MONITORING DEVICE: DESIGN AND TESTING, {IMECE2024-143064}

Rick Zhang - *University of Washington Tacoma*
Heather Dillon - *University of Washington Tacoma*
Casey Quinn - *NSG Engineering Solutions*

U10. SCHLIEREN ORIENTED BACKGROUND IMAGING IN EXPERIMENTAL FLUID FLOW, {IMECE2024-142994}

Albert Meza - *University of Washington - Tacoma*

U11. A TESTBED DEMONSTRATION OF A STATICALLY ADJUSTABLE CONTINUOUS VARIABLE TRANSMISSION MECHANISM, {IMECE2024-149553}

Franklin Ho - *University of California, Berkeley*
Hannah Stuart - *University of California, Berkeley*
Michael Abbott - *Santa Clara University*

U12. ASSISTIVE DORSAL GRASPER MODIFICATIONS FOR IN-HOME EXPERIMENT, {IMECE2024-149563}

Alahe Akhavan - *University of California, Berkeley*
Drew Mcpherson - *University of California, Berkeley*
Jungpyo Lee - *University of California, Berkeley*
Hannah Stuart - *University of California, UC Berkeley*

U13. AN ELASTOHYDRODYNAMIC HIGH-PRESSURE SEAL FOR SUPER CRITICAL CARBON DIOXIDE POWER PLANTS, {IMECE2024-146127}

Jonah Henry - *Georgia Southern University*
Sevki Cesmeci - *Georgia Southern University*

U14. AN AUTOMATED MACHINE VISION TRAINING MACHINE FOR REAL-TIME SORTING APPLICATIONS, {IMECE2024-149873}

Emma Capaldi - *Phillips Academy Andover*
Annina Capaldi - *Phillips Academy Andover*

U15. OPTICAL DISTORTIONS FOR APPLYING CAMERA-BASED DEFORMATION MEASUREMENTS THROUGH RADIATION SHIELDED WINDOWS, {IMECE2024-149879}

Brayden Monson - *Utah State University*
Prasenjit Dewanjee - *Utah State University*
Senorita Sarker - *Utah State University*
Jeffery Wagner - *Utah State University*
Matthew Hope - *Utah State University*
Robert Hansen - *Idaho National Laboratory*
Raushan Singh - *Utah State University*
Ryan Berke - *Utah State University*

U16. IDENTIFICATION OF DAMAGE STATE IN CARBON FIBER REINFORCED COMPOSITES USING TRANSFER LEARNING, {IMECE2024-149854}

Hannah Jones - *University of Arkansas at Little Rock*
Shweta Dabetwar - *University of Arkansas at Little Rock*

U17. MACHINE LEARNING-AIDED DESIGN AND FINITE ELEMENT ANALYSIS OF DENTAL IMPLANTS IN ABAQUS, {IMECE2024-149128}

Waleed Alghareeb - *American University of the Middle East*
Moath Aleidi - *American University of the Middle East*
Hamad Albloushi - *Amercian University of the Middle East*
Hussain Alsalman - *American University of the Middle East*
Yousef Alyacoub - *American University of the Middle East*

U18. USER-OPTIMIZED VARIABLE JOINT STIFFNESS DESIGN FOR ANKLE FOOT MOTION CONTROL IN ORTHOSES AND EXOSKELETONS, {IMECE2024-148641}

Vanessa Young - *kennesaw state university*
Lucas Schwenck - *Kennesaw State University*
Connor Talley - *Kennesaw State University*
Gwenevere Wrye - *kennesaw state university*
Coskun Tekes - *Kennesaw State University*
Geza Kogler - *Kennesaw State University*
Ayse Tekes - *Kennesaw State University*

U19.IMPLEMENTATION OF MODULAR CODE FRAMEWORK FOR AUTONOMOUS ROBOTS AND SAFEGUARDS, {IMECE2024-147826}

Gannon Ziviello - *Columbia University*
Lohith Annadevula - *University of Massachusetts-Lowell*
Odera Dim - *Brookhaven National Laboratory*

U20. LI-ION BATTERY STATE AWARENESS VIA NONDESTRUCTIVE VIBRATION MEASUREMENTS, {IMECE2024-150099}

Yujie Xi - *Worcester Polytechnic Institute*
Ethan Zhou - *Worcester Polytechnic Institute*
Zhu Mao - *Worcester Polytechnic Institute*

U21. TESTING OF ADDITIVELY MANUFACTURED HIGH IMPACT POLYSTYRENE (HIPS) TENSILE SPECIMENS, {IMECE2024-150145}

Aaron Adams - *Kennesaw State University*
Mechack Nduwa - *Kennesaw State University*
Edgar Bryant - *Kennesaw State University*
David Sollberg - *Kennesaw State University*
Cameron Coates - *Kennesaw State University*

U22. BENCH-SCALE HEAT PIPE AND VAPOR CHAMBER TESTING FOR SPACE APPLICATIONS, {IMECE2024-150580}

Jorge Pombo - *Florida International University*
Tra-My Justine Richardson - *NASA Ames Research Center*

U23. TUNING AND VALIDATING A MULTI-ROTOR DRONE MODEL USING A STATIONARY FRAME, {IMECE2024-150706}

Ian Agopsowicz - *Seattle University*
Samuel Mesfin - *Seattle University*
Sameer Gill - *Seattle University*
Marco-Antonio Sahagun - *Seattle University*
Emile Edora - *Seattle University*
Samantha Hoang - *Seattle University*

U24. A NOVEL MAGNETORHEOLOGICAL INSULIN DELIVERY SYSTEM FOR TYPE 1 DIABETES PATIENTS, {IMECE2024-146020}

Madison Procyk - *Georgia Southern University*
Sevki Cesmeci - *Georgia Southern University*

U25 RAPID AND ENERGY-EFFICIENT MANUFACTURING OF FIBER-REINFORCED COMPOSITE STRUCTURES VIA A NOVEL FILAMENT WINDING APPROACH, {IMECE2024-150855}

Soroush Dashtizad - *Colorado State University*
Rowan Vannier - *Colorado State University*
Walter Jordan - *Colorado State University*
Mostafa Yourdkhani - *Colorado State University*

U26. ECHNO-ECONOMIC ANALYSIS OF OFFSHORE WIND AND HYDROGEN INTEGRATED SYSTEM IN THE GULF OF MEXICO, {IMECE2024-150882}

Zaina Anarwala - *University of Illinois at Urbana Champaign*
Honglin Li - *University of Texas at Dallas*
Jie Zhang - *University of Texas at Dallas*

U27. DESIGN OF A HIGH-POWERED ROCKET WITH GROUND TARGET ACQUISITION SYSTEM, {IMECE2024-150993}

Ellyssa Purdy - *University of Wisconsin-Green Bay*
Dalton Kowalkowski - *University of Wisconsin-Green Bay*
Unique Vang - *University of Wisconsin-Green Bay*
Caitlyn Hendricks - *University of Wisconsin-Green Bay*
Bryon Cobb - *University of Wisconsin-Green Bay*

U28. EVALUATION AND PRACTICAL ASSESSMENT OF GROUND PENETRATING RADAR (GPR) FOR BRIDGE DECK ASSESSMENT, {IMECE2024-151462}

Josie Gunter - *Georgia Southern University*
Elsie Lappin - *Georgia Southern University*
Vicktor Helgason - *Georgia Southern University*
Hossein Taheri - *Georgia Southern University*
Saman Hedjazi - *Georgia Southern University*

U29. COMBUSTION CHARACTERISTICS OF IRON PARTICLES IN JET FUEL DROPLETS, {IMECE2024-151596}

Lucas Boger - *Wilkes University*
Frank Yuscavage - *Wilkes University*
Mohsen Ghamari - *Wilkes University*

U30. SPRAY AND ATOMIZATION CHARACTERISTICS OF SUSPENSIONS OF IRON NANOPARTICLES IN WATER, {IMECE2024-151598}

Frank Yuscavage - *Wilkes University*
Mohsen Ghamari - *Wilkes University*

U31. PERFORMANCE ANALYSIS OF FRESH WHOLE BLOOD TRANSFUSION UNDER HIGH-ALTITUDE AND LOW-TEMPERATURE CONDITIONS, {IMECE2024-151622}

Emine Foust - *US Military Academy*
Andrea Riddle - *United States Military Academy*

U32. FRESH WHOLE BLOOD TRANSFUSION IN AUSTERE ENVIRONMENTS – MATERIALS TESTING, {IMECE2024-151632}

Emine Foust - *US Military Academy*
Keira Vesy - *United States Military Academy*

U33. FAST AND EFFICIENT WELDING INSPECTION OF STRUCTURAL STEEL USING ADAPTIVE PHASED ARRAY ULTRASONIC NDT, {IMECE2024-151427}

Elsie Lappin - *Georgia Southern University*
Chowdhury Md Irtiza - *Georgia Southern University*
Hossein Taheri - *Georgia Southern University*
Saman Hedjazi - *Georgia Southern University*
Bishal Silwal - *Georgia Southern University*

U34. CHOLINE AMINO ACID IONIC LIQUIDS: SUSTAINABLE AND HIGH-PERFORMANCE LUBRICANTS AND ADDITIVES, {IMECE2024-151795}

Esmond Lau - *Rochester Institute of Technology*
Moni Chavez - *Rochester Institute of Technology*
Davis Kipkania Kiboi - *Rochester Institute of Technology*
Patricia Iglesias - *Rochester Institute of Technology*

U35. SAMPLING-BASED REGENERATIVE AGRICULTURE: UNCREWED SOIL HEALTH MONITORING SYSTEM, {IMECE2024-145591}

Jackson Otis - *Rochester Institute of Technology*
Jun Han Bae - *Rochester Institute of Technology*

U36. MODAL ANALYSIS OF A TOOTHPICK PATTERN STRUCTURE, {IMECE2024-151826}

Spencer Walter - *Union College*
Hasan Al Ba'ba'a - *Union College*

U37. ASYMMETRY EFFECTS ON TRUNCATION RESONANCES IN ACOUSTIC METAMATERIALS, {IMECE2024-151895}

Peter Schroder - *Union College*
Hasan Al Ba'ba'a - *Union College*

U38.0INVESTIGATION OF MECHANICAL PROPERTIES OF WAAM ER120S STEEL COMPONENTS, {IMECE2024-151903}

Jack Zupfer - *University of St. Thomas*
Aidan Hilger - *University of St. Thomas*
Jack Taggart - *University of St. Thomas*

U39. OPTIMIZATION AND MACHINE LEARNING CONTROL OF MULTI-TEMPERATURE, MULTI-MODULE THERMAL ENERGY STORAGE SYSTEMS FOR SINGLE-PHASE IMMERSION COOLING APPLICATIONS, {IMECE2024-151924}

Guelor Kabeya - *San Francisco State University*
Alanna Cooney - *San Francisco State University*

U40.0CHATGPT-BASED MODEL FOR CONTROLLING ACTIVE ASSISTIVE DEVICES USING NON- INVASIVE EEG SIGNAL, {IMECE2024-151638}

Tais Mota - *University of South Florida*
Saket Sarkar - *University of South Florida*
Redwan Alqasemi - *University of South Florida*

U41. PREVENTING EFFICIENCY DEGRADATION IN THERMOELECTRIC GENERATORS WITH ADVANCED METAMATERIAL DESIGNS FOR WASTE HEAT RECOVERY, {IMECE2024-151735}

Bo Huang - *Dartmouth College*
Ya Tang - *Dartmouth College*
Yan Li - *Dartmouth College*

U42. CHARACTERISTICS OF POLLUTANT EMISSION ON THE VARIATION OF EQUIVALENCE RATIOS AND REACTION TEMPERATURE DURING NH3 AND CO CO-FIRING IN A BUBBLING FLUIDIZED BED REACTOR, {IMECE2024-151448}

Sung Jin Pak - *Korea Institute of Energy Research*
Ho-Tae Im - *Korea Institute of Energy Research*
Seong-Ju Kim - *Korea Institute of Energy Research*
Sung-Ho Jo - *Korea Institute of Energy Research*
Tae-Young Mun - *Korea Institute of Energy Research*

U43. OPTICAL DISTORTIONS FOR APPLYING CAMERA-BASED DEFORMATION MEASUREMENTS THROUGH RADIATION SHIELDED WINDOWS, {IMECE2024-150517}

Brayden Monson - *Utah State University*
Prasenjit Dewanjee - *Utah State University*
Jeffery Wagner - *Utah State University*
Raushan Singh - *Utah State University*
Senorita Sarker - *Utah State University*
Robert Hansen - *Idaho National Laboratory*
Ryan Berke - *Utah State University*

U44. REDESIGN OF SURGICAL FIXATION DEVICE – A SENIOR DESIGN PROJECT, {IMECE2024-145748}

Alexander Carpenter - *Northern Michigan University*
Seth Hornick - *Northern Michigan University*
Kaden Clausen - *Northern Michigan University*
Seth Norberg - *Northern Michigan University*

U45. UNMANNED AERIAL SYSTEM ADAPTABLE PAYLOAD, {IMECE2024-145472}

Gunar Daniels - *United States Military Academy*
Luciano Borjas - *United States Military Academy*
Connor Cavanagh - *United States Military Academy*
Riley Furlong - *United States Military Academy*

U46. BI-PROPELLENT LIQUID ROCKET ENGINE, {IMECE2024-145228}

Jorge Solis - *New Mexico State University*
Caedon Carrasco - *New Mexico State University*
Anthony Gonzalez - *New Mexico State University*
Bryce Richards - *New Mexico State University*
Brenden Moriarty - New Mexico State University

U47. DESIGN AND DEVELOPMENT OF LEO: AN AFFORDABLE BIOMECHANICALLY INSPIRED QUADRUPED ROBOT WITH COGNITIVE ABILITIES, {IMECE2024-145294}

Jubaer Tanjil Jami - *Bangladesh University of Engineering and Technology*
Taskin Mehereen - *Bangladesh University of Engineering and Technology*
Mir Tahmidur Rahman - *Bangladesh University of Engineering and Technology*
Munirul Alam - *Bangladesh University of Engineering and Technology*

U48. SPINNING CURRENT TECHNIQUE FOR GRAPHENE-BASED HALL SENSORS, {IMECE2024-145353}

Ashutosh Shrama - *M S Ramaiah Institute of Technology*
Vinit Shenvi - *M S Ramaiah Institute of Technology*
Gokul P Patel - *M S Ramaiah Institute of Technology*
Adhithi M - *M S Ramaiah Institute of Technology*

RISING STARS OF MECHANICAL ENGINEERING CELEBRATION & SHOWCASE

NOVEMBER 19TH
1:30PM–3:00PM - EXHIBIT HALL A

Track Organizer: **Reuben Kraft**, *Pennsylvania State University*

RS 1. MICROBIAL DYNAMICS AT OIL-WATER INTERFACES., {IMECE2024-147319}

Tagbo Niepa - *Carnegie Mellon University*

RS 2. UNDERSTANDING THE ROLE OF BUOYANT FLOW FOR ACCURATE AND ROBUST SCALE MODELING OF UPWARD FLAME SPREAD, {IMECE2024-149865}

Ya-Ting Liao - *Case Western Reserve University*

RS 3. BREAKING SPACE FOR MAKING SHAPE: PARTITIVE GEOMETRY FOR DESIGN AND MANUFACTURING, {IMECE2024-149577}

Vinayak Krishnamurthy - *Texas A&M University*

RS 4. COUPLING FORMULATION AND PROCESSABILITY FOR THE DESIGN AND MANUFACTURE OF POLYMERIC MATERIALS, {IMECE2024-147969}

Blair Brettmann - *Georgia Institute of Technology*

RS 5. WIRE ARC ADDITIVE MANUFACTURING OF MOLYBDENUM ALLOY FOR HIGH-TEMPERATURE APPLICATIONS: RESIDUAL STRESSES AND POROSITY CONSIDERING DUCTILE-TO-BRITTLE TRANSITION TEMPERATURE, {IMECE2024-147978}

Duck Bong Kim - *Tennessee Tech University*

RS 6. BONE-BASED NANOPARTICLES (BNPS) PROMOTES OSTEOGENIC DIFFERENTIATION OF MESENCHYMAL STEM CELLS (MSCS), {IMECE2024-148001}

Shue Wang - *University of New Haven*

RS 7. ADVANCED SURFACE MODIFICATION OF POWDERS FOR SINTERING-BASED MANUFACTURING, {IMECE2024-148012}

Carlos Castano - *Virginia Commonwealth University*

RS 8. DEVELOPMENT OF SCALABLE AND EXPEDITIOUS ADDITIVE MANUFACTURING (SEAM): A SOLUTION TO HIGH PRODUCTION ADDITIVE MANUFACTURING, {IMECE2024-150189}

Haseung Chung - *Michigan State University*
Zhiyuan Qu - *Michigan State University*
Patrick Kwon - *Michigan State University*

RS 9. LONGEVITY OF SUPERHYDROPHOBIC SURFACE DUE TO GAS DIFFUSION AND TURBULENT FLOWS, {IMECE2024-150175}

Hangjian Ling - *University of Massachusetts Dartmouth*

RS 10. FLUORINE-FREE LIQUID-REPELLENT SURFACES, {IMECE2024-150205}

Wei Wang - *University of Tennessee, Knoxville*

RS 11. MEMBRANES AS A TOOL TO DECARBONIZE FERTILIZER PRODUCTION, {IMECE2024-150227}

Oishi Sanyal - *West Virginia University*
Km Prottoy Shariar Piash - *West Virginia University*
Nhan Khuu - *West Virginia University*

RS 12. PHOTOACOUSTIC-BRILLOUIN MICROSCOPY FOR MULTIMODAL MECHANICAL IMAGING OF TUMOR GROWTH, {IMECE2024-150257}

Jitao Zhang - *Wayne State University*

RS 13. ALTERNATING CURRENT ELECTROPHORESIS IN SPATIALLY NON-UNIFORM ELECTRIC FIELDS, {IMECE2024-149978}

Poster Presentation
Ran An - *University of Houston*

RS 14. CLOGGING: THE SELF-SABOTAGE OF SUSPENSIONS FLOWS, {IMECE2024-149663}

Alban Sauret - *University of California Santa Barbara and University of Maryland College Park*

RS 15. CAREER: NEUROMECHANICS OF HUMAN-ROBOT INTERACTION VIA ROBOT-ASSISTED IN-VIVO IMAGING OF NEUROMUSCULAR FUNCTION, {IMECE2024-149994}

Fabrizio Sergi - *University of Delaware*

RS 16. ADVANCING WIND TURBINE SUSTAINABILITY: DESIGNING SELF-HEALABLE AND RE-PROCESSABLE VITRIMER COMPOSITES THROUGH COVALENT ADAPTABLE NETWORKS, {IMECE2024-150011}

Amin Kuhzadmohammadi - *Baylor University*
Ning Zhang - *Baylor University*

RS 17. RAMAN SPECTROSCOPY FOR LIPIDOMIC PROFILING WITH SINGLE-CELL RESOLUTION, {IMECE2024-150013}

Manas Ranjan Gartia - *Louisiana State University*
Elnaz Sheikh - *Louisiana State University*
Maria Iftesum - *Louisiana State University*
Kirti Agrawal - *Louisiana State University*

RS 18. DYNAMICS OF DROPLET IMPACT ON LIQUID FILMS: COALESCENCE AND MIXING, {IMECE2024-149958}

Abhishek Saha - *University of California San Diego*

RS 19. MODULATING ENDOTHELIAL CELL FUNCTION USING TARGETED ELECTRICAL STIMULATION, {IMECE2024-150039}

Govindarajan Srimathveeravalli - *University of Massachusetts*

RS 20. LOW-TEMPERATURE PLASMA ASSISTED COMBUSTION OF OXYGENATED FUELS FOR CLEANER AND SUSTAINABLE MOBILITY, {IMECE2024-150040}

Nicholas Tsolas - *Auburn Univeristy*

RS 21. OPTICAL SUPER-RESOLUTION NANOTHERMOMETRY VIA STIMULATED EMISSION DEPLETION IMAGING OF UPCONVERTING NANOPARTICLES, {IMECE2024-150508}

Andrea Pickel - *University of Rochester*

RS 22. UNDERSTANDING RADIATION HEAT TRANSFER IN COMPLEX POROUS MEDIA THROUGH ANALYTICAL RENEWAL THEORY, {IMECE2024-150319}

Shima Hajimirza - *Stevens Institute of Technology*

RS 23. PHOTOTHERMAL RECYCLING NANOSENSOR FOR CONTINUOUS BIOMOLECULAR MONITORING, {IMECE2024-150334}

Yongchen Tai - *University of Florida*
Yunshen Li - *University of Florida*
Wenting Wang - *University of Florida*
Mitchell Conover - *University of Florida*
Jing Pan - *University of Florida*

RS 24. ENGINEERING STEM CELL MICROENVIRONMENT FOR LYMPHATIC REGENERATION, {IMECE2024-150346}

Donny Hanjaya-Putra - *University of Notre Dame*

RS 25. CAN NEWBORN CHEST VIBRATIONS PROVIDE A NEW METHOD FOR CARDIOVASCULAR HEALTH ASSESSMENT?, {IMECE2024-149664}

Amirtahà Taebi - *Mississippi State University*

RS 26. THREE-DIMENSIONAL FLUID-STRUCTURE INTERACTION DIAGNOSTICS USING A SINGLE CAMERA, {IMECE2024-150385}

Vrishank Raghav - *Auburn University*

RS 27. USING COMBINED 3D VELOCIMETRY AND LATTICE BOLTZMANN METHOD TO INVESTIGATE THE WICKING FLOW ON MICRO-ENGINEERED SURFACES, {IMECE2024-150461}

Zeeshan Ahmad Khan - *University of California, Riverside*
Arpan Ghimire Bohara - *University of California, Riverside*
Mahedi Hassan - *Montana State University*
Yaofa Li - *University of California, Riverside*

RS 28. CONSISTENT CONTINUUM FORMULATION AND ROBUST NUMERICAL MODELING OF NON-ISOTHERMAL PHASE CHANGING MULTIPHASE FLOWS, {IMECE2024-150908}

Amneet Pal Bhalla - *San Diego State University*

RS 29. THERMAL RADIATION FOR ENERGY APPLICATIONS: PASSIVE COOLING AND NONRECIPROCAL RADIATION, {IMECE2024-150815}

Linxiao Zhu - *Penn State University*

RS 30. THERMAL MANAGEMENT OF ELECTRONICS FROM DEVICE LEVEL TO DATA CENTERS, {IMECE2024-150703}

Damena Agonafer - *University of Maryland College Park*

RS 31. HOLISTIC INVESTIGATIONS OF MOLTEN SALT FUSION ENERGY SYSTEMS: SYSTEM AND COMPONENT DESIGN USING COMPUTATIONAL AND EXPERIMENTAL METHODOLOGIES, {IMECE2024-150761}

Lane Carasik - *Virginia Commonwealth University*
Sierra Tutwiler - *Virginia Commonwealth University*
Trevor Franklin - *Virginia Commonwealth University*
Ryan Mcguire - *Virginia Commonwealth University*
Arturo Cabral - *Northrop Grumman*

RS 32. PLASMA IN ENERGY RESEARCH, {IMECE2024-151205}

Sayan Biswas - *University of Minnesota*

RS 33. INTERACTION OF TURBULENCE WITH FLEXIBLE SURFACES: COHERENT STRUCTURES AND NEAR-WALL DYNAMICS, {IMECE2024-151046}

Yulia Peet - *Arizona State University*

RS 34. MOLECULAR CONTRAST AGENTS FOR GENE DELIVERY AND SUPER-RESOLUTION ULTRASOUND IMAGING, {IMECE2024-149665}

Sydney Turner - *University of Oklahoma*
Musarrat Amin - *University of Oklahoma*
Bhattacharjee Adree - *University of Oklahoma*
Sangpil Yoon - *University of Oklahoma*

RS 35. UNRAVELING PREDICTIVE AND MULTISCALE DYNAMICS IN TURBULENCE FOR FLOW CONTROL, {IMECE2024-149671}

Jae Sung Park - *University of Nebraska-Lincoln*

RS 36. UNDERSTANDING INTERNAL SHORT CIRCUIT CAUSED THERMAL RUNAWAY OF LI-ION CELLS THROUGH IN-SITU DIAGNOSIS, {IMECE2024-149714}

Guangsheng Zhang - *The University of Alabama in Huntsville*

RS 37. LINKING STRUCTURE TO FUNCTION AT ELECTROCHEMICAL INTERFACES: LI-ION AND BEYOND, {IMECE2024-149715}

Lauren Marbella - *Columbia University*

RS 38. PUSHING THE LOWER LIMIT OF THERMAL CONDUCTIVITY IN LAYERED MATERIALS, {IMECE2024-149689}

Jun Liu - *North Carolina State University*

RS 39. MATERIAL ENGINEERING TOOLSET FOR NEUROLOGICAL INTERFACES, {IMECE2024-149675}

Siyuan Rao - *Binghamton University, SUNY*

RS 40. VISCERAL PAIN FROM COLON AND RECTUM: THE MECHANOTRANSDUCTION AND BIOMECHANICS, {IMECE2024-149676}

Bin Feng - *University of Connecticut*

RS 41. AN EX VIVO MICROFLUIDIC WHOLE HUMAN LYMPH NODE MODEL TO UNCOVER MECHANISMS OF DRUG TRANSPORT AND IMMUNE FUNCTION, {IMECE2024-149903}

Jason Gleghorn - *University of Delaware*

RS 42. MULTI-SCALE FLOW PHYSICS MODEL FOR INHALED TRANSMISSION IN THE UPPER RESPIRATORY TRACT, {IMECE2024-149673}

Saikat Basu - *South Dakota State University*

RS 43. ULTRA-SENSITIVE, SELECTIVE, AND LABEL-FREE OPTICAL SENSING FOR FUNDAMENTAL SCIENCE, ENVIRONMENTAL MONITORING, AND TRANSLATIONAL MEDICINE, {IMECE2024-149681}

Judith Su - *University of Arizona*

RS 44. INTRADERMAL NANOPARTICLES AS MINIMALLY INVASIVE IMPLANTS FOR HUMAN HEALTH, {IMECE2024-149682}

Carson Bruns - *University of Colorado Boulder*

RS 45. UNRAVELING CELLULAR DISEASE MECHANISMS THROUGH MECHANOBIOLOGY: BRIDGING BASIC SCIENCE AND TRANSLATIONAL MEDICINE, {IMECE2024-148590}

Scott Wood - *University of New England*

RS 46. CREEP PERFORMANCE OF GAS METAL ARC DIRECTED ENERGY DEPOSITION HAYNES 282, {IMECE2024-148553}

Sophie Hill - *Colorado School of Mines*
Jonah Klemm-Toole - *Colorado School of Mines*

RS 47. CLIMATE RESILIENT PROACTIVE LANDSLIDE REPAIR, {IMECE2024-148554}

Sadik Khan - *Jackson State University*
Amber Spears - *Jackson State University*
Fariha Rahman - *Jackson State University*
Avipriyo Chakraborty - *Jackson State University*

RS 48. STRESS MODULATED PHASE TRANSITION IN 2D MATERIALS AND SILICON, {IMECE2024-148558}

Wei Gao - *Texas A&M University*

RS 49. DISCOVERY OF MULTI-FUNCTIONAL POLYIMIDES THROUGH HIGH-THROUGHPUT SCREENING USING EXPLAINABLE MACHINE LEARNING, {IMECE2024-148559}

Ying Li - *University of Wisconsin-Madison*

RS 50. THE SELF-SENSING INVERSE PROBLEM: DEDUCING FULL-FIELD MATERIAL CONDITION FROM ELECTRICAL DATA, {IMECE2024-148572}

Tyler Tallman - *Purdue University*

RS 51. MANUFACTURING SOFT FUNCTIONAL COMPOSITES THROUGH MECHANICALLY INDUCED ASSEMBLY OF LIQUID MICROSTRUCTURES IN ELASTIC FILMS, {IMECE2024-148577}

Michael D. Bartlett - *Virginia Tech*

RS 52. MICROFLUIDIC MODELING OF 3D CELLULAR MICROENVIRONMENTS, {IMECE2024-149761}

Ioannis Zervantonakis - *University of Pittsburgh*

RS 53. MORPHOLOGICAL COMPUTATION FOR RESILIENT DYNAMIC LOCOMOTION OF COMPLIANT LEGGED ROBOTS WITH APPLICATION TO PRECISION AGRICULTURE, {IMECE2024-148583}

Konstantinos Karydis - *University of California, Riverside*

RS 54. HIGHLY TUNABLE DRY ADHESION THROUGH CONSTRAINED BUCKLING, {IMECE2024-148152}

Wanliang Shan - *Syracuse University*

RS 55. MECHANICS OF NEXT-GENERATION COMPOSITES USING CELLULOSE AND BIOINSPIRED INTERFACES, {IMECE2024-148186}

Anamika Prasad - *Florida International University*

RS 56. CAREER: MULTISCALE MODELING OF THROMBUS FORMATION AND ITS RESPONSE TO EXTERNAL LOADS, {IMECE2024-148187}

Jifu Tan - *Northern Illinois University*

RS 57. BUCKLING-ENABLED DEPLOYABLE AERODYNAMIC SURFACES, {IMECE2024-148193}

Kawai Kwok - *Purdue University*

RS 58. CAREER: UNRAVELING MECHANISMS OF MECHANICAL DEGENERATION IN ELASTIN, {IMECE2024-148217}

Anna Tarakanova - *University of Connecticut*

RS 59. LUCY T. ZHANG, {IMECE2024-148242}

Roberto Andresen Eguiluz - *University of California Merced*

RS 60. MECHANICS OF BIOLOGICAL MOTOR CONTROL: ASSEMBLY, MATURATION, AND REPAIR AT THE NEUROMUSCULAR INTERFACE, {IMECE2024-148255}

Ritu Raman - *MIT*

RS 61. DYNAMIC LOCOMOTION WITH PLASTICITY FOR REMOTE SENSING IN CRAWLSPACES, {IMECE2024-148476}

Alireza Ramezani - *Northeastern University*

RS 62. UNDERSTANDING THE DYNAMIC MECHANICAL ADAPTATIONS OF BONE TISSUE AT SMALL LENGTH SCALES, {IMECE2024-148538}

Ottman Tertuliano - *University of Pennsylvania*

RS 63. PERSONALIZING SENSORY-DRIVEN COMPUTERIZED INTERFACES TO OPTIMIZE MOTOR REHABILITATION, {IMECE2024-149718}

Raviraj Nataraj - *Stevens Institute of Technology*

RS 64. MECHANICS OF ARCHITECTED MATERIALS: SELF-ARCHITECTURE AND DYNAMIC RESPONSES, {IMECE2024-148651}

Carlos Portela - *MIT*

RS 65. EXTRUSION-BASED ADDITIVE MANUFACTURING OF SUSTAINABLE THERMOPLASTICS VIA ENZYME ENCAPSULATION AND MICROFLUIDIC STRUCTURING OF HIERARCHICAL COMPOSITES, {IMECE2024-148652}

Cecily Ryan - *Montana State University*

RS 66. SQUISHY GRANULAR MECHANICS, {IMECE2024-148654}

Srinivas Selvaraju - *University of Houston*
Nikhil Karanjgaokar - *Worcester Polytechnic Institute*
Shailendra Joshi - *University of Houston*

RS 67. CAREER: COMBINING ENGINEERING, BIOMECHANICS, AND GENETIC ANALYSIS TO ENABLE THE DESIGN OF STRUCTURALLY SUPERIOR GRAIN CROP, {IMECE2024-148655}

Douglas Cook - *Brigham Young University*

RS 68. CAREER: ADAPTIVE SONIFICATION TO IMPROVE BALANCE DURING EVERYDAY MOBILITY, {IMECE2024-148657}

Antonia Zaferiou - *Stevens Institute of Technology*

RS 69. MICRO AND MESOSCALE MODELS OF CARDIAC TISSUE TO UNDERSTAND CARDIAC FUNCTION, {IMECE2024-148660}

Uditha Weerasinghage - *University of Central Florida*
Kevin Moulin - *Boston Children's Hospital*
Dennis Ogiermann - *Ruhr University Bochum*
Daniel Balzani - *Ruhr University Bochum*
Luigi Perotti - *University of Central Florida*

RS 70. ENGINEERING FUNCTIONAL MONOFILAMENT FIBERS, {IMECE2024-148608}

Alexander Gumennik - *Indiana University Bloomington*

RS 71. HIGH-ASPECT-RATIO MULTI-MATERIAL THREE-DIMENSIONAL MICROSTRUCTURES VIA MICROFLUIDIC DIRECT LASER WRITING, {IMECE2024-148618}

Ryan Sochol - *University of Maryland, College Park*

RS 72. ACCELERATING PROCESS MAPPING IN METAL ADDITIVE MANUFACTURING, {IMECE2024-148623}

Kun-Hao Huang - *Pennsylvania State University*
Nandana Menon - *Pennsylvania State University*
Amrita Basak - *Pennsylvania State University*

RS 73. RECONSTRUCTION OF MULTIMODAL DEFORMATIONS OF SOFT ROBOTS VIA DISTRIBUTED STRAIN SENSING, {IMECE2024-148625}

Hangbo Zhao - *University of Southern California*

RS 74. UNDERSTANDING PHASE-CHANGE IN NANOSTRUCTURES TO ADVANCE THERMAL TRANSPORT STRATEGIES, {IMECE2024-149734}

Shankar Narayan - *Rensselaer Polytechnic Institute*
Brandon Murray - *Rensselaer Polytechnic Institute*
Xue Li - *Rensselaer Polytechnic Institute*

RS 75. UNRAVELING A CENTRAL MYSTERY OF ARTIFICIAL INTELLIGENCE: HEAVY-TAIL PERSPECTIVE, {IMECE2024-148628}

Chang-Han Rhee - *Northwestern University*

RS 76. QUANTUM MANUFACTURING OF HETEROGENEOUS LATERAL SEMICONDUCTOR-SUPERCONDUCTOR JUNCTIONS (Q-MELEON), {IMECE2024-148632}

Wenzhuo Wu - *Purdue University*

RS 77. DESIGNING MATERIALS AND PROCESSES FOR INK-BASED 3D PRINTING OF MULTISCALE MULTIMATERIAL MULTIFUNCTIONAL SYSTEMS, {IMECE2024-148634}

John (William) Boley - *Boston University*

RS 78. INVESTIGATING COUPLED THERMAL, MECHANICAL, AND ELECTRICAL PHENOMENA IN HIGH-TEMPERATURE MATERIALS USING THERMAL WAVE SENSORS, {IMECE2024-148638}

Sean Lubner - *Boston University*

RS 79. A MULTISCALE COMPUTATIONAL AND EXPERIMENTAL FRAMEWORK TO ELUCIDATE THE BIOMECHANICS OF INFANT GROWTH, {IMECE2024-148640}

Victor Huayamave - *Embry-Riddle Aeronautical University*

RS 80. MULTI-PRINCIPAL ELEMENT NANOSTRUCTURES VIA NANOSECOND LASER-INDUCED DEWETTING, {IMECE2024-149243}

Ritesh Sachan - *Oklahoma State University*

RS 81. RECONFIGURABLE DYNAMIC METAMATERIALS INTERACTING WITH FLOWING FLUIDS, {IMECE2024-148668}

Eleonora Tubaldi - *University of Maryland, College Park*

RS 82. A LONG SHORT TERM MEMORY NETWORK-BASED SURROGATE MODEL FOR PREDICTING DUCTILE FAILURE, {IMECE2024-148670}

Surajit Dey - *Arizona State University*
Ravi Yellavajjala - *Arizona State University*

RS 83. MACHINE LEARNING-ASSISTED CALIBRATION OF FORCE FIELDS FOR ATOMISTIC SIMULATION OF POLYMER NANOCOMPOSITES, {IMECE2024-148671}

Hamid Ghasemi - *Howard University*
Hessam Yazdani - *University of Missouri*

RS 84. ADDITIVE MANUFACTURING ACOUSTOFLUIDIC DEVICES WITH SPATIALLY ENGINEERED 3D-FLUIDICS, {IMECE2024-148675}

Tyler Ray - *University of Hawaii at Manoa*

RS 85. THERMAL TRANSPORT IN POLYMER NANOFIBERS UNDER STRAIN MODULATION, {IMECE2024-149740}

Woochul Lee - *University of Hawaii at Manoa*

RS 86. SMART ADDITIVE MANUFACTURING: M4AM - MODELING, MATERIALS SCIENCE, MONITORING, AND MACHINE LEARNING FOR RAPID PART QUALITY ASSURANCE, {IMECE2024-148727}

Prahalad Rao - *Virginia Tech*

RS 87. ADDRESSING UNMET NEEDS WITH 3D PRINTED ELECTRONICS, {IMECE2024-148683}

Yong Lin Kong - *Rice University*

RS 88. NONLINEAR ROD MECHANICS AND INVERSE MODELS INSPIRED BY BIOLOGICAL FILAMENTS, {IMECE2024-148996}

Muhammad Hassaan Ahmed - *University of California*
Sachin Goyal - *University of California*

RS 89. CAREER: A NOVEL ELECTRICALLY-ASSISTED MULTIMATERIAL PRINTING APPROACH FOR SCALABLE ADDITIVE MANUFACTURING OF BIOINSPIRED HETEROGENEOUS MATERIALS ARCHITECTURES, {IMECE2024-148027}

Cindy (Xiangjia) Li - *Arizona State University*

RS 90. UNDERSTANDING JOINING MECHANISM IN DISSIMILAR METAL ADDITIVE MANUFACTURING, {IMECE2024-148043}

Somayeh Pasebani - *Oregon State University*

RS 91. TOWARD RIPEST PHOTOPOLYMER ADDITIVE MANUFACTURING (PAM): CYBER-PHYSICAL DUAL-WAVELENGTH PHOTOINHIBITION AIDED PAM, {IMECE2024-148048}

Xiayun Zhao - *University of Pittsburgh*

RS 92. 3D/4D PRINTING OF MULTIFUNCTIONAL ACTIVE COMPOSITES WITH DYNAMIC MOLECULAR BONDING, {IMECE2024-148049}

Kai Yu - *University of Colorado Denver*

RS 93. SMART TEXTILES FOR PERSONALIZED HEALTH CARE, {IMECE2024-148057}

Jun Chen - *University of California, Los Angeles*

RS 94. ON THE MERCURIAL BEHAVIOR OF IONIC LIQUIDS AT SLIDING INTERFACES, {IMECE2024-148060}

Filippo Mangolini - *The University of Texas at Austin*

RS 95. GEOMETRY AND ELASTICITY OF DEPLOYABLE STRUCTURES AND MORPHING METAMATERIALS, {IMECE2024-148061}

Hussein Nassar - *University of Missouri - Columbia*

RS 96. HIGHLY RAPID AND SENSITIVE NANOMECHANOELECTRICAL DETECTION OF NUCLEIC ACIDS, {IMECE2024-149749}

Jinglei Ping - *University of Massachusetts Amherst*

RS 97. COMPUTATIONAL MODELS OF SOFT TISSUE GROWTH AND REMODELING DURING PREGNANCY, {IMECE2024-148076}

Kyoko Yoshida - *University of Minnesota*

RS 98. SMART SURFACE ACOUSTIC WAVE DEVICES WITH TUNABLE AND RECONFIGURABLE FEATURES, {IMECE2024-147798}

Chen Shen - *Rowan University*

RS 99. CREATING TOUGH, SUSTAINABLE MATERIALS USING FRACTURE SIZE-EFFECTS AND ARCHITECTURE, {IMECE2024-148103}

Lucas Meza - *University of Washington*

RS 100. ILLUMINATING INTERFACIAL MECHANICS: UTILIZING MECHANOPHORES TO QUANTIFY STRESS IN POLYMER COMPOSITES, {IMECE2024-148118}

Chelsea Davis - *University of Delaware*

RS 101. REDUCED-COMPLEXITY MODELS FOR TRANSITIONAL AND TURBULENT FLOWS, {IMECE2024-148136}

Aaron Towne - *University of Michigan*

RS 102. CAREER: MANUFACTURING USA: DEEP LEARNING TO UNDERSTAND FATIGUE PERFORMANCE AND PROCESSING RELATIONSHIP OF COMPLEX PARTS BY ADDITIVE MANUFACTURING FOR HIGH-CONSEQUENCE APPLICATIONS, {IMECE2024-147872}

Jia Liu - *Auburn University*

RS 103. ADDITIVE NANOMANUFACTURING FOR NANOPARTICLE ASSEMBLY, {IMECE2024-147873}

Kenan Song - *UGA*
Varunkumar Thippanna - *University of Georgia*
Arunachalam Ramanathan - *University of Georgia*
Sri Vaishnavi Thummalapalli - *University of Georgia*
Martin Sobczak - *University of Georgia*

RS 104. ACOUSTIC ANGULAR MOMENTUM PROPAGATION IN COMPLEX MEDIA AND APPLICATIONS FOR MEDICINE AND COMMUNICATIONS, {IMECE2024-147874}

Chengzhi Shi - *University of Michigan*

RS 105. NEW EXPERIMENTS FOR RAPID CALIBRATION OF ELASTOPLASTIC MECHANICAL PROPERTIES, {IMECE2024-147875}

Andrew Gross - *University of South Carolina*

RS 106. ROBUST, REVERSIBLE, AND STIMULI-RESPONSIVE THERMODYNAMIC ADHESION IN HYDROGELS, {IMECE2024-147877}

Qihan Liu - *University of Pittsburgh*

RS 107. IMPROVED SIMULATION OF SHOCK-DOMINATED FLOWS USING HIGH-ORDER IMPLICIT SHOCK TRACKING, {IMECE2024-149753}

Matthew Zahr - *University of Notre Dame*
Tianci Huang - *University of Notre Dame*
Charles Naudet - *University of Notre Dame*
Huijing Dong - *University of Notre Dame*
Alexander Perez-Reyes - *University of Notre Dame*

RS 108. MULTI-SCALE MANUFACTURING OF POROUS CARBON NANOSTRUCTURES, {IMECE2024-147883}

Pei Dong - *George Mason University*

RS 109. NANOSCALE RADIATIVE HEAT TRANSFER FOR ENHANCED THERMAL INFRARED ENERGY CONVERSION AND COOLING,

Yi Zheng - *Northeastern University*

RS 110. SOFTOPUS: A SOFT OCTOPUS ROBOT POWERED BY ARTIFICIAL MUSCLES, {IMECE2024-147891}

Caterina Lamuta - *The University of Iowa*

RS 111. MANUFACTURING OF SOLID PARTICLE-LIQUID METAL MIXTURES FOR SOFT ROBOTICS AND STRETCHABLE ELECTRONICS, {IMECE2024-147893}

Eric Markvicka - *University of Nebraska-Lincoln*

RS 112. CAREER: PREDICTION AND UNDERSTANDING OF THERMAL TRANSPORT ACROSS SUCCESSIVE INTERFACES, {IMECE2024-147906}

Tianli Feng - *University of Utah*

RS 113. ATMOSPHERIC-PRESSURE MANUFACTURING OF NANOCRYSTALLINE DIAMONDS BY PLASMA-ASSISTED FLAT FLAME VAPOR DEPOSITION, {IMECE2024-147907}

Lili Cai - *University of Illinois Urbana-Champaign*

RS 114. ADDITIVE MANUFACTURING OF POLYMER COMPOSITES VIA IN-SITU THERMAL CURING, {IMECE2024-147911}

Mostafa Yourdkhani - *Colorado State University*

RS 115. SELF-SENSING ARTIFICIAL MUSCLE TISSUES FOR LOCOMOTION IN SOFT MACHINES, {IMECE2024-147912}

Ryan Truby - *Northwestern University*

RS 116. PASSIVE AND ADAPTIVE THERMOREGULATION WEARABLES WITH INTEGRATED SENSING FOR SHIPBOARD EMERGENCY RESPONSE, {IMECE2024-147913}

Lili Cai - *University of Illinois Urbana-Champaign*

RS 117. MECHANICAL METAMATERIAL ELECTRONICS: THEORY, DESIGN AND APPLICATIONS, {IMECE2024-147917}

Amir Alavi - *University of Pittsburgh*

RS 118. THERMAL TRANSPORT AND ENERGY CONVERSION AT EXTREME SCALES, {IMECE2024-149840}

Longji Cui - *University of Colorado Boulder*

RS 119. BACTERIAL MULTIPHYSICAL INTERACTIONS WITH HARD AND SOFT MATERIALS INTERFACES: TOWARDS COMPUTATIONAL DESIGN OF ENGINEERED LIVING MATERIALS, {IMECE2024-147924}

Jingjie Yeo - *Cornell University*

RS 120. MULTISCALE MODELING OF COMPLEX BEHAVIORS OF NANO-CRUMPLES, {IMECE2024-147926}

Wenjie Xia - *Iowa State University*

RS 121. CAREER: STATIC, DYNAMIC AND KINEMATIC ANALYSIS AND OPTIMIZATION OF TENSEGRITY STRUCTURES THROUGH CELLULAR MORPHOGENESIS, {IMECE2024-147927}

Landolf Rhode-Barbarigos - *University of Miami*

RS 122. MECHANOEPIGENETICS: THE CHROMATIN IN THE CELL NUCLEUS AS A MEDIATOR BETWEEN THE MECHANICAL FORCES AND THE BIOLOGICAL PHENOTYPE, {IMECE2024-147938}

Soham Ghosh - *Colorado State University*

RS 123. MULTISCALE MULTIPHYSICS DESIGN OF MULTIFUNCTIONAL MATERIALS AND STRUCTURES, {IMECE2024-147946}

Ahmad Najafi - *Drexel University*

RS 124. CAREER: EXPLORING ROBUST ROBOT MANIPULATION THROUGH COMPLIANCE- AND MOTION-BASED MANIPULATION FUNNELS, {IMECE2024-147952}

Kaiyu Hang - *Rice University*

RS 125. ELECTRO-CHEMO-MECHANICS OF MULTISCALE ACTIVE MATERIALS FOR NEXT-GENERATION ENERGY STORAGE, {IMECE2024-147953}

Poster Presentation
Joy Datta - *New Jersey Institute of Technology (NJIT)*

RS 126. BINDER-FREE ADDITIVE MANUFACTURING OF CERAMICS USING HYDROTHERMAL-ASSISTED JET FUSION, {IMECE2024-147956}

Poster Presentation
Xuan Song - *University of Iowa*

RS 127. MODERNIZING RISK ASSESSMENT THROUGH SYSTEMATIC INTEGRATION OF PHM AND PRA (SIPPRA), {IMECE2024-147964}

Poster Presentation
Katrina Groth - *University of Maryland*

RS 128. CAREER: NUDGING AND LEVERAGING THE ONSET OF BUCKLING IN ARCHITECTED MATERIALS FOR PERFORMANCE GAINS, {IMECE2024-147966}

Poster Presentation
David Restrepo - *The University of Texas at San Antonio*

TRACK 16: GOVERNMENT AGENCY STUDENT POSTER COMPETITION

NOVEMBER 20TH
12:00PM–3:00PM - EXHIBIT HALL A

Track Organizer: Po-Hao Adam Huang, Ph.D., *University of Arkansas*

G1. SINGLE-WALLED CARBON NANOTUBE BIOSENSOR NANOMATERIAL INTERACTION WITH CANCER CELLS, {IMECE2024-147111}

Portia Plange - *University of Nebraska-Lincoln*
Nicole Iverson - *University of Nebraska-Lincoln*

G2. UNDERSTANDING THE DYNAMIC AND THERMAL BEHAVIORS OF COLLOIDAL DROPLETS TOWARD A NOVEL FREEZING-BASED INKJET PRINTING CONCEPT, {IMECE2024-145995}

Xiaoxiao Zhang - *City College of New York*
Haipeng Zhang - *City College of New York*
Yang Liu - *The City College of New York*

G3. ATOMICALLY-THIN 2D PLATINUM METALLENES SYNTHESIZED BY SOLID-STATE TRANSFORMATION OF 0D PLATINUM NANOPARTICLES, {IMECE2024-143424}

Muhammad Shahbaz Rafique - *University of South Florida*
Zhewen Yin - *University of South Florida*
Daiyue Wei - *University of South Florida*
Ossie Douglas - *University of South Florida*
Huijuan Zhao - *Clemson University*
Michael Cai Wang - *University of South Florida*

G4. OPTIMIZING THE SELF-HEALING PARAMETERS OF DCN-PEI VITRIMER THROUGH WELDING AND LAP SHEAR TESTING, {IMECE2024-150102}

Bernard Mahoney - *Southern University and A&M College*
Patrick Mensah - *Southern University and A&M College*
Guoqiang Li - *Louisiana State University*

G5. RESONANT CHARACTERIZATION OF HYSTERETIC NONLINEARITY IN CRANIAL SUTURED BONES, {IMECE2024-150115}

Anna E Lisner - *Georgia Institute of Technology*
Nima Etemadi - *Georgia Institute of Technology*
Prabhakaran Manogharan - *Georgia Institute of Technology*
Alper Erturk - *Georgia Institute of Technology*

G6. DEVELOPMENT AND INVESTIGATION OF A BIODEGRADABLE STARCH-BASED POLYMERIC COMPOSITE FOR STRUCTURAL APPLICATIONS, {IMECE2024-150116}

Obed Nyavor - *Southern University and A & M College*
John Konlan - *Louisiana State University*
Guoqiang Li - *Louisiana State University*

G7. MYCELIUM-COIR BASED BIO-COMPOSITE MATERIALS FOR BUILDING ENVELOPE, {IMECE2024-150046}

Gargi De - *Syracuse University*
Libin Yang - *Syracuse University*
Zhao Qin - *Syracuse University*

G8. MICROSTRUCTURE AND DYNAMICS OF NANOCELLULOSE NETWORK: INSIGHTS INTO THE DEFORMATIONAL BEHAVIORS, {IMECE2024-150049}

Wenjie Xia - *Iowa State University*
Zhaofan Li - *Iowa State University*

G9. CHARACTERIZING RURAL RESIDENT ACCEPTANCE OF DRONE DELIVERY: A LARGE LANGUAGE MODEL EMPOWERED APPROACH, {IMECE2024-150054}

Henan Zhu - *Rensselaer Polytechnic Institute*
Xiaozheng He - *Rensselaer Polytechnic Institute*

G10. A DIGITAL TWIN MODEL FOR SORGHUM GROWTH SIMULATION AND BREEDING OPTIMIZATION, {IMECE2024-150056}

Zheng Ni - *Oklahoma State University*
Yanbin Chang - *Oklahoma state university*
Maria Salas Fernandez - *Iowa state university*
Lizhi Wang - *Oklahoma state university*

G11. ENHANCING RESILIENCE IN LOW-INCOME HOUSING: POST-PANDEMIC INSIGHTS FROM THE NSF BRITE SYNERGY PROJECT, {IMECE2024-150059}

Homeira Mirhosseini - *Penn State University*
Esther Obonyo - *Penn State University*

G12. UNLOCKING INSIGHTS IN THE POST-BUCKLING BEHAVIOR OF MECHANICAL SYSTEMS: EFFICIENT SENSITIVITY ANALYSIS VIA HYPAD-FEM, {IMECE2024-150026}

David Y. Risk-Mora - *The University of Texas at San Antonio*
Juan D. Navarro - *The University of Texas at San Antonio*
Mauricio Aristizabal - *The University of Texas at San Antonio*
Harry R. Millwater - *The University of Texas at San Antonio*
David Restrepo - *The University of Texas at San Antonio*

G13. LEVERAGING MACHINE LEARNING FOR ENHANCED CONTROL IN COLLOIDAL SELF-ASSEMBLY SYSTEMS., {IMECE2024-150035}

Andres Lizano-Villalobos - *Louisiana State University*
Xun Tang - *Louisiana State University*

G14. MODELING OF ULTRA-FAST MICRO-ACTUATION USING THERMAL BUBBLE-DRIVEN MICRO-PUMPS, {IMECE2024-143372}

Brandon Hayes - *University of Colorado Boulder*
Robert Maccurdy - *University of Colorado Boulder*

G15. UNLOCKING POTENTIAL: ADDITIVELY MANUFACTURED METASURFACE-DRIVEN PERFORMANCE ENHANCEMENT IN DUAL-BAND 5G ANTENNA, {IMECE2024-150023}

Md Ashif Islam Oni - *North Dakota State University*
Shuvashis Dey - *North Dakota State University*

G16. SPATIOTEMPORAL DYNAMICS OF FOCUSED ULTRASOUND-INDUCED ACTUATION IN 4D-PRINTED SHAPE MEMORY POLYMERS, {IMECE2024-149944}

Hrishikesh Kulkarni - *Virginia Tech*
David Safranski - *Enovis Foot & Ankle*
Shima Shahab - *Virginia Tech*

G17. SYNTHESIS OF MULTI-PRINCIPAL ELEMENT SILICIDE THIN FILMS USING PULSED LASER DEPOSITION, {IMECE2024-149947}

Lance Spiegel - *Oklahoma State University*
Joshua Marvin - *Oklahoma State University*
Vikas Paduri - *Oklahoma State University*
Ronald Noebe - *Glenn Research Center*
Ritesh Sachan - *Oklahoma State University*

G18. UNCERTAINTY QUANTIFICATION IN ARCHITECTED MATERIALS: EFFECTS OF IMPERFECTIONS ON BUCKLING RESPONSE, {IMECE2024-149953}

Melvin Hernandez - *University of Texas at San Antonio*
David Risk - *University of Texas at San Antonio*
Juan Navarro - *University of Texas at San Antonio*
Mauricio Aristizabal - *University of Texas at San Antonio*
Harry Millwater - *University of Texas at San Antonio*
David Restrepo - *University of Texas at San Antonio*

G19. A MULTIMODAL INFORMATION-BASED BI-DIRECTIONAL EMOTION INTERACTION INTERFACE FOR FRIENDLY AND EMPATHIC COLLABORATIVE ROBOTS, {IMECE2024-149957}

Jordan Murphy - *Montclair State University*
Rui Li - *Montclair State University*

G20. VIBRATION-ASSISTED MAGNETRON SPUTTERING: A NOVEL APPROACH FOR HIGH-PURITY CORE-SHELL PARTICLE SYNTHESIS WITH TAILORED PROPERTIES, {IMECE2024-149905}

Camilo Bedoya Lopez - *Virginia Commonwealth University*
Carlos Castano - *Virginia Commonwealth University*

G21. RECONFIGURATION OF A DIGITAL LIGHT PROJECTION 3D PRINTER AND SCALE OPTIMIZATION FOR PRINTING MINUTE 3D OBJECTS, {IMECE2024-149925}

Enoch Ameyaw - *Southern University A&M College*
Fareed Dawan - *Southern University A&M College*
Patrick Mensah - *Southern University A&M College*

G22. ELECTROCHEMICAL PERFORMANCE OF AQUEOUS ZINC-ION BATTERY CATHODES AT DIVERSE TEMPERATURES, {IMECE2024-149926}

Hunter Maclennan - *Oregon State University*
Bret Marckx - *University of Maryland, Baltimore County*
Özgür Çapraz - *University of Maryland, Baltimore County*

G23. DEVELOPMENT OF A NOVEL ROBOTIC SYSTEM FOR SEMI-AUTONOMOUS VASCULAR ANASTOMOSIS, {IMECE2024-150253}

Jesse Haworth - *Johns Hopkins University*
Rishi Biswas - *Johns Hopkins University*
Michael Kam - *Johns Hopkins University*
Justin Opfermann - *Johns Hopkins Univesity*
Yaning Wang - *Johns Hopkins University*
Desire Pantalone - *University Hospital Careggi in Florence*
Francis Creighton - *Johns Hopkins Medicine*
Robin Yang - *Johns Hopkins Medicine*
Jin Kang - *Johns Hopkins Univeristy*
Axel Krieger - *Johns Hopkins Univeristy*

G24. BUCKLING OF DEPLOYABLE PROPELLER BLADES, {IMECE2024-150288}

Bowen Li - *Purdue university*
Kawai Kwok - *Purdue University*

G25. EXPERIMENTAL METHOD TO DETERMINE THE MODE-I IN-SITU BOND STRENGTH-TOUGHNESS DEVELOPMENT DURING AUTOMATED PLACEMENT OF UNCURED THERMOSET CARBON/EPOXY TOWS, {IMECE2024-140937}

Debrup Chakraborty - *University of South Carolina*
Karan Kodagali - *University of South Carolina*
Sreehari Rajan Kattil - *University of South Carolina*
Dennis Miller - *University of South Carolina*
Subramani Sockalingam - *University of South Carolina*
Michael A Sutton - *University of South Carolina*

G26. COMBINING NON-SELF-LIMITING MATERIALS TO ACHIEVE SELF-LIMITING ELECTROSPRAY DEPOSITION, {IMECE2024-150258}

Isha Shah - *Rutgers University*
Sarah Park - *Rutgers University*
Emily Li - *Rutgers University*
Jonathan Singer - *Rutgers University*

G27. MECHANICS OF SCALE-COVERED PLATE UNDER BENDING DEFORMATION, {IMECE2024-150270}

Pranta Rahman Sarkar - *University of Central Florida*
Hossein Ebrahimi - *University of Central Florida*
Md Shahjahan Hossain - *University of Central Florida*
Hessein Ali - *Stress Engineering Services, Inc.*
Ranajay Ghosh - *University of Central Florida*

G28. MULTILAYER ANALYSIS OF ENERGY NETWORKS, {IMECE2024-150150}

Muhammad Kazim - *North Dakota State University*
Harun Pirim - *North Dakota State University*
Shoumang Shi - *North Dakota State University*
Di Wu - *North Dakota State University*

G29. ADVANCED REGISTRATION CONTROL IN ROLL-TO-ROLL PRINTING: SPATIAL-TERMINAL ITERATIVE LEARNING STRATEGIES, {IMECE2024-150237}

Zifeng Wang - *Northeastern University*
Xiaoning Jin - *Northeastern University*

G30. BLADE-VORTEX INTERACTION ON A TWISTING FLAT PLATE, {IMECE2024-150109}

Carlos Soto - *University of Central Florida*
Samik Bhattacharya - *University of Central Florida*

G31. GEOMETRIC PHASE-BASED INVERSE PROBLEMS FOR THE PREDICTION OF CHANGES IN PERMAFROST PROPERTIES DUE TO CLIMATE CHANGE, {IMECE2024-150110}

Harry Mayrhofer - *University of Arizona*
Samy Missoum - *University of Arizona*
Pierre Deymier - *University of Arizona*
Keith Runge - *University of Arizona*
Araceli Hernandez Granados - *University of Arizona*

G32. OPTIMIZING THERMAL SPRAY COATING THICKNESSES ON VARIED SUBSTRATE ROUGHNESS BASED ON PULL-OFF TENSILE AND PORTABLE ADHESION TESTS, {IMECE2024-150124}

Gul Badin - *North Dakota State University*
Ying Huang - *North Dakota State University*

G33. STRESS CONSTRAINED OPTIMAL DESIGN OF BUILDING INSULATIONS UNDER SPATIALLY CORRELATED UNCERTAINTY, {IMECE2024-150158}

Pratyush Kumar Singh - *University at Buffalo*
Danial Faghihi - *University at Buffalo*

G34. INVESTIGATING THE COMPOSITION DISTRIBUTION AND HARDNESS OF DISSIMILAR AL6061/AL7075 JOINTS PRODUCED VIA ADDITIVE FRICTION STIR DEPOSITION, {IMECE2024-150161}

Kekeli Doe Agbewornu - *Southern University and A&M College*
Antonio Wells - *Southern University and A&M College*
Patrick Mensah - *Southern University and A&M College*
Congyuan Zeng - *Southern University and A&M College*

G35. ENGINEERING THE PRECIPITATE GROWTH PATTERNS IN SINGLE CRYSTAL SUPERALLOYS, {IMECE2024-150162}

Alireza Doroudi - *The University of Alabama*
Noah Holtham - *The University of Alabama*
Keivan Davami - *The University of Alabama*

G36. GRAIN INTERFACE FUNCTIONAL DESIGN TO CREATE DAMAGE RESISTANCE IN POLYCRYSTALLINE TANTALUM, {IMECE2024-140969}

Olajesu Olanrewaju - *Iowa State University*
Kevin Jacob - *Iowa State University*
Curt Bronkhorst - *University of Wisconsin - Madison*
Nan Chen - *University of Wisconsin-Madison*
Marko Knezevic - *University of New Hampshire*
William Musinski - *University of Wisconsin, Milwaukee*
Sid Pathak - *Iowa State University*

G37. EVALUATION OF TURBULENCE MODELS IN SIMULATING RAYLEIGH-BÉNARD CONVECTION FOR CLOUD FORMATION, {IMECE2024-150167}

Ivana Barley - *Southern University and A&M College*
Stephen Akwaboa - *Southern University and A&M College*
Patrick Mensah - *Southern University and A&M College*

G38. EFFECT OF EXHAUST GAS RECIRCULATION ON LAMINAR BURNING VELOCITY AND INTRINSIC CELLULAR INSTABILITIES FOR A HYDROGEN SEQUENTIAL STAGE GAS TURBINE COMBUSTOR, {IMECE2024-150172}

Elisa Toulson - *Michigan State University*
Ahmed Barain - *Michigan State University*

G39. EFFECTS OF SPARK PLASMA SINTERING HEAT TREATMENT ON THE MICROSTRUCTURE AND MECHANICAL PROPERTIES OF METALLIC ALLOYS FABRICATED BY LASER POWDER BED FUSION., {IMECE2024-150174}

Edem Honu - *Southern University and A & M College*
Congyuan Zeng - *Southern Univeristy and A & M College*
Patrick Mensah - *Southern University and A & M College*

G40. ENHANCED RESOLUTION, THROUGHPUT, AND STABILITY OF AEROSOL JET PRINTING VIA IN LINE HEATING, {IMECE2024-150193}

Bella Guyll - *Iowa State University*
Logan Petersen - *Iowa State University*
Cary Pint - *Iowa State University*
Ethan Secor - *Iowa State University*

G41. ALL-PRINTED MULTI-MATERIAL FLEXIBLE THERMOELECTRIC DEVICES, {IMECE2024-150194}

Nicole Bacca - *Boston University*
William Boley - *Boston University*

G42. CHARACTERIZATION OF HUMAN TRUST IN ROBOT THROUGH MULTIMODAL PHYSICAL AND PHYSIOLOGICAL BIOMETRICS IN HUMAN-ROBOT PARTNERSHIPS, {IMECE2024-150195}

Jesse Parron - *Montclair State University*
Weitian Wang - *Montclair State University*

G43. ENABLING ROBUST AND RECONFIGURABLE MODULAR SOFT ROBOTS WITH A SWITCHABLE MAGNETIC CONNECTOR DESIGN, {IMECE2024-150786}

Setayesh Yavari - *Louisiana State University*
Sunella Ramnath - *Louisiana State University*
Parsa Molaei - *Louisiana State University*
Hunter Gilbert - *Louisiana State University*

G44. MAGNETIC RESPONSE OF A CORE-SHELL COMPOSED OF MAGNETICALLY DIFFERENT MATERIALS, NI/CR/CU, {IMECE2024-150783}

Andrew Chernesky - *Virginia Commonwealth University*
Camilo Bedoya - *Virginia Commonwealth University*
Carlos Castano - *Virginia Commonwealth University*

G45. AUTOMATING CHAIN OF CUSTODY DOCUMENTATION FOR FILTER-BASED AIR POLLUTION SAMPLING, {IMECE2024-150809}

Apurva Iyengar - *Colorado State University*
Christian L'orange - *Colorado State University*

G46. SPONTANEOUS SNAPPING-INDUCED JET FLOWS FOR FAST, MANEUVERABLE SOFT SWIMMER, {IMECE2024-150793}

Haitao Qing - *North Carolina State University*
Jie Yin - *North Carolina State University*

G47. 3D PRINTING-ENABLED NANOPARTICLE ASSEMBLY FOR VERSATILE APPLICATIONS, {IMECE2024-142527}

Arunachalam Ramanathan - *University of Georgia*
Kenan Song - *University of Georgia*
Shuai Feng - *Arizona State University*

G48. MULTI-SCALE ANALYSIS OF ENHANCED INTERFACIAL SHEAR STRENGTH VIA FRONTAL POLYMERIZATION, {IMECE2024-150794}

Haining Zhang - *Syracuse University Composite Materials Lab*
Amirreza Tarafdar - *Syracuse University Composite Materials Lab*
Yeqing Wang - *Syracuse University Composite Materials Lab*

G49. INFLUENCE OF LASER POWER BED FUSION PARAMETERS ON MICROSTRUCTURE AND MECHANICAL PROPERTIES OF FUNCTIONALLY GRADED IN718/SS316L MATERIALS, {IMECE2024-150828}

Sara Ranjbareslamloo - *University of Toledo*
Anwar Al Gamal - *University of Toledo*
Gabriel Awuku Dzukey - *University of Toledo*
Ala Qattawi - *University of Toledo*

G50. ADDITIVE MANUFACTURING OF THERMOSET POLYMER COMPOSITES VIA IN-SITU THERMAL CURING, {IMECE2024-150821}

Carter Dojan - *Colorado State University*
Morteza Ziaee - *Colorado State University*
Alireza Masoumipour - *Colorado State University*
Mostafa Yourdkhani - *Colorado State University*

G51. ELUCIDATING PHONON COHERENCE BEHAVIORS AND THERMAL TRANSPORT IN SUPERLATTICES BY WAVE-PACKET SIMULATION, {IMECE2024-150816}

Theodore Maranets - *University of Nevada, Reno*
Yan Wang - *University of Nevada, Reno*

G52. IMPROVING THE INTERLAYER BONDING STRENGTH OF ADDITIVELY MANUFACTURED POLYMER COMPOSITES VIA AN ALTERNATING THERMAL STIMULUS, {IMECE2024-150817}

Leo Allen - *Colorado State University*
Carter Dojan - *Colorado State University*
Mostafa Yourdkhani - *Colorado State University*

G53. THE NONLINEAR ESHELBY INCLUSION PROBLEM AND ITS ISOMORPHIC LIMIT, {IMECE2024-150819}

Joseph Bonavia - *Massachusetts Institute of Technology*
Chockalingam Senthilnathan - *Massachusetts Institute of Technology*
Tal Cohen - *Massachusetts Institute of Technology*

G54. MECHANICAL BEHAVIOR OF FE-MN-AL-NI SHAPE MEMORY ALLOY PROCESSED BY ADDITIVE MANUFACTURING, {IMECE2024-150791}

Anwar Algamal - *University of Toledo*
Gabriel Dzukey - *University of Toledo*
Sara Ranjbareslamloo - *University of Toledo*
Ala Qattawi - *University of Toledo*

G55. IMPROVING INTERFACIAL BONDING OF 3D PRINTED COMPOSITE PARTS USING INTEGRATED THERMOPLASTIC PARTICLES, {IMECE2024-150814}

Erik Christoffersen - *Colorado State University*
Mostafa Yourdkhani - *Colorado State University*

G56. STRAIN INDUCED LOCALIZED TO BULK MODE TRANSITION IN HEXAGONAL ELASTIC META-STRUCTURES, {IMECE2024-150909}

Adib Rahman - *Texas A&M University*
Tyler Hogenkamp - *Kansas State University*
Raj Kumar Pal - *Texas A&M University*

G57. PHONON LOCAL NON-EQUILIBRIUM AT AL/SI INTERFACE, DEMONSTRATED BY MACHINE LEARNING MOLECULAR DYNAMICS, {IMECE2024-150925}

Krutarth Khot - *Purdue University*
Boyuan Xiao - *Purdue University*
Zherui Han - *Purdue University*
Ziqi Guo - *Purdue University*
Zixin Xiong - *Purdue University*
Xiulin Ruan - *Purdue University*

G58. SCALABLE NANOMANUFACTURING OF HIGHLY-UNIFORM, ATOMICALLY-THIN 2D NANORIBBONS WITH ÅNGSTRÖM-PRECISE EDGE CHIRALITY, {IMECE2024-142632}

Zhewen Yin - *Department of Mechanical Engineering, University of South Florida*
Darley (Daiyue) Wei - *University of South Florida*
Ossie Douglas - *University of South Florida*
Muhammad Shahbaz Rafique - *University of South Florida*
Huijuan Zhao - *Clemson University*
Michael Cai Wang - *University of South Florida*

G59. FLEXIBLE STANDING WAVE GENERATION BETWEEN VARIOUSLY ORIENTED SURFACES VIA ACOUSTIC METASURFACE RETROREFLECTORS AND DEFLECTORS, {IMECE2024-150930}

Chadi Ellouzi - *Rowan University*
Ali Zabihi - *Rowan University*
Farhood Aghdasi - *Rowan University*
Chen Shen - *Rowan University*

G60. 3D-4-BIG DATA: 3D PRINTED ELECTRONICS ENABLED 4D VISUALIZATION OF BIG DATA NETWORKS, {IMECE2024-150935}

Julian Kim - *Pennsylvania State University*
Clayton Colson - *Pennsylvania State University*
Alex Fatemi - *Pennsylvania State University*
Patrick Dudas - *Pennsylvania State University*
Guha Manogharan - *Pennsylvania State University*
Yogasudha Veturi - *Pennsylvania State University*

G61. CONTROLLING POROSITY OF ELECTROSPRAYED POLYIMIDE FILMS THROUGH CO-SOLVENT BLENDING, {IMECE2024-150915}

Emily Li - *Rutgers University - New Brunswick*
Robert Green-Warren - *Rutgers University - New Brunswick*
Isha Shah - *Rutgers University - New Brunswick*
Jonathan Singer - *Rutgers University - New Brunswick*

G62. CONTROLLED DEPOSITION OF NANOFIBERS: TOWARDS 3D PRINTING OF COMPLEX NANO-FILAMENTARY MATERIALS, {IMECE2024-150904}

Emmanuel Kweku Mensah - *University of Nebraska Lincoln*
Benjamin Bashtovoi - *University of Nebraska Lincoln*
Mikhail Kartoshov - *University of Nebraska Lincoln*
Yuris Dzenis - *University of Nebraska Lincoln*

G63. CO-DESIGN EXPLORATION FRAMEWORK FOR MULTILEVEL DECISION SUPPORT UNDER UNCERTAINTY, {IMECE2024-150896}

Anand Balu Nellippallil - *Florida Institute of Technology*
H M Dilshad Alam Digonta - *Florida Institute of Technology*

G64. MECHANICAL AND THERMAL PROPERTY TESTING OF HYBRIDIZED LAMINATE COMPOSITES, {IMECE2024-150726}

Government Agency Student Poster Presentation
Abubakar Sumaila - *Southern University A&M College*
Patrick Mensah - *Southern University A&M College*
Maryam Jahan - *Southern University A&M College*

G65. RAPID FABRICATION OF CARBON FIBER REINFORCED EPON-BASED EPOXY RESIN COMPOSITES VIA HOT PRESS-TRIGGERED FRONTAL POLYMERIZATION, {IMECE2024-150762}

Amirreza Tarafda - *Syracuse university*
Yeqing Wang - *Syracuse university*

G66. SIMULATIONS OF THE EFFECT OF RALOXIFENE PROTEIN DEFORMATION, {IMECE2024-150751}

Chizaram Ugboh - *Purdue University*

G67. UNLOCKING THE POTENTIAL OF PHI-BITS: ADVANCING QUANTUM-INSPIRED COMPUTING, {IMECE2024-150723}

Abrar Nur E Faiaz - *Wayne State University*
Akinsanmi S Ige - *University of Arizona*
Kazi Tahsin Mahmood - *Wayne State University*
M Afridi Hasan - *University of Arizona*
M Arif Hasan - *Wayne State University*
Pierre Deymier - *University of Arizona*
Keith Runge - *University of Arizona*
Josh Levine - *University of Arizona*

G68. DATA-DRIVEN MODELING TO CONNECT ADAPTIVE TWIST MORPHING WIND TURBINE BLADES TO SYSTEM PERFORMANCE, {IMECE2024-150730}

James Roetzer - *University of North Carolina at Charlotte*
Xingjie Li - *University of North Carolina at Charlotte*
John Hall - *University of North Carolina at Charlotte*

G69. STRAIN-PROGRAMMABLE PARTICLE DIFFUSION IN STRETCHABLE HYDROGELS, {IMECE2024-142773}

Chuwei Ye - *Michigan State University*
Tsz Hung Wong - *Michigan State Univerisity*
Jiabin Liu - *Michigan State Univerisity*
Congjie Wei - *Texas A&M University*
Xinyue Liu - *Michigan State Univerisity*
Ziyou Song - *National University of Singapore*
Chenglin Wu - *Texas A&M University*
Zhaojian Li - *Michigan State Univerisity*
Shaoting Lin - *Michigan State Univerisity*

G70. DEVELOPING WORKLOAD-INFORMED CREW CONFIGURATION RECOMMENDATIONS FOR EMERGENCY MEDICAL SERVICES (USING 911 DISPATCH DATA), {IMECE2024-150732}

Setareh Darvishi - *Wichita State University*
Laila Cure - *Wichita State University*
Paul Misasi - *Sedgwick County EMS and Kansas College of Osteopathic Medicine*

G71. THE BONDING OF TUNGSTEN-STAINLESS STEEL FUNCTIONAL GRADED MATERIAL MANUFACTURED USING LASER POWER BED FUSION, {IMECE2024-150741}

Gabriel Dzukey - *University of Toledo*
Anwar Al Gamal - *University of Toledo*
Sara Ranjbareslamloo - *University of Toledo*
Md. Muhiul Islam Muhit - *University of Toledo*
Ala Qattawi - *University of Toledo*

G72. CADMAP: CREATING MAPPED SOLID MODELS OF DEFORMED AS-MANUFACTURED GEOMETRIES THAT LINK TO AN ORIGINAL REFERENCE DESIGN, {IMECE2024-150742}

Lijie Liu - *Iowa State University*
Stephen Holland - *Iowa State University*
Adarsh Krishnamurthy - *Iowa State University*
Qing Li - *Iowa State University*

G73. TIME-SEPARATED PULSE RELEASE-ACTIVATION OF AN ENZYME FROM ALGINATE-BASED HYDROGEL USING ELECTROCHEMICALLY PRODUCED LOCAL PH CHANGES, {IMECE2024-150745}

Ilya Sterin - *Clarkson University*
Anna Tverdokhlebova - *Clarkson University*
Evgeny Katz - *Clarkson University*
Oleh Smutok - *Clarkson University*

G74. LIQUID-INFUSED 3D PRINTED ARCHITECTURES WITH ENHANCED MECHANICAL PERFORMANCE, {IMECE2024-150711}

Man Chen - *University of Louisville*
Yanyu Chen - *University of Louisville*

G75. TOWARDS A TYPOLOGY OF KNOWLEDGE INTEGRATION IN CROSS-DISCIPLINARY COLLABORATIONS, {IMECE2024-150702}

Shruti Punjabi - *Virginia Tech*
Stanley Grant - *Virginia Tech*
Megan Rippy - *Virginia Tech*
Todd Schenk - *Virgnia Tech*
Thomas Birkland - *North Carolina State University*
Eranga Galappaththi - *Virginia Tech*
Shalini Misra - *Virginia Tech*

G76. CAN WE 3D PRINT 100% DENSE COPPER? A PROCESS PARAMETER STUDY FOR METAL FUSED FILAMENT FABRICATION, {IMECE2024-150694}

Zac Leblanc - *Mississippi State University*
Wenmeng Tian - *Mississippi State University*
Jian Zhao - *Mississippi State University*

G77. PROCEDURAL GENERATION OF 3D MAIZE PLANT MODELS, {IMECE2024-150603}

Mozhgan Hadadi - *Iowa State University of Science and Technology*
Mehdi Saraeian - *Iowa State University of Science and Technology*
Aditya Balu - *Iowa State University of Science and Technology*
Talukder Zaki Jubery - *Iowa State University of Science and Technology*
Yawei Li - *Iowa State University of Science and Technology*
Patrick Schnable - *Iowa State University of Science and Technology*
Adarsh Krishnamurthy - *Iowa State University of Science and Technology*
Baskar Ganapathysubramanian - *Iowa State University of Science and Technology*

G78. MODULATION OF CONTROLLED PROTEIN RELEASE FROM ALGINATE HYDROGEL VIA ELECTROCHEMICALLY GENERATED LOCAL PH CHANGES, {IMECE2024-150591}

Anna Tverdokhlebova - *Clarkson University*
Ilya Sterin - *Clarkson University*
Oleh Smutok - *Clarkson University*
Evgeny Katz - *Clarkson University*

G79. ENHANCING MOLECULAR DYNAMICS VISUALIZATION: INTEGRATING OVITO WITH BLENDER THROUGH BLEMD, {IMECE2024-150640}

Jackson Plummer - *Iowa State University*
Brandon Runnels - *Iowa State University*

G80. STABILITY AND OSCILLATORY RESPONSE OF BECK'S COLUMN WITH NONLINEAR CONSTITUTIVE LAWS, {IMECE2024-148997}

Muhammad Hassaan Ahmed - *University of California Merced*
Soheil Fatehiboroujeni - *Colorado State University*
Sachin Goyal - *University of California Merced*

G81. TURBULENT RAYLEIGH-BÉNARD CONVECTION OF JOVIAN PLANETS' GASES IN A CYLINDRICAL ENCLOSURE: THE EFFECT OF BULK TEMPERATURE, {IMECE2024-150641}

Ebenezer Ashimolowo - *Southern University and A&M College*
Stephen Akwaboa - *Southern University and A&M College*
Patrick Mensah - *Southern University and A&M College*

G82. OPERANDO MONITORING AND ANALYTICS OF INTERNAL TEMPERATURE DYNAMICS IN LI-ION BATTERIES, {IMECE2024-150647}

Anuththara Alujjage - *Purdue University*
Avijit Karmakar - *Purdue University*
Bairav Vishnugopi - *Purdue University*
Partha Mukherjee - *Purdue University*

G83. OPTIMIZING WILDFIRE EVACUATION WARNINGS: AN AGENT-BASED APPROACH FOR EFFECTIVE PROTECTIVE ACTION RECOMMENDATIONS, {IMECE2024-150649}

Chenqiang Liu - *Oregon State University*
Louisa Wildman - *Oregon State University*
Ashley Bosa - *Boise State University*
Brittany Brand - *Boise State University*
Haizhong Wang - *Oregon State University*

G84. DISTINGUISH OPTICAL AND ACOUSTIC PHONON TEMPERATURES OF SUPPORTED 2D MATERIALS BY NANOSECOND TIME-RESOLVED RAMAN SCATTERING, {IMECE2024-150670}

Mahya Rahbar - *Iowa State University*
Xinwei Wang - *Iowa State University*

G85. LEAF WETNESS MEASUREMENT USING UHF CHIP-BASED RFID SENSOR THROUGH IMPEDANCE MAPPING, {IMECE2024-150677}

Md Mirazur Rahman - *North Dakota State University*
Shuvashis Dey - *North Dakota State University*

G86. MODELING STRESS DISTRIBUTION IN AM PARTS USING POINT PROCESS AND FINITE ELEMENT SIMULATIONS, {IMECE2024-150681}

Shehzaib Irfan - *Auburn University*
Jia Liu - *Auburn University*

G87. BIPOLAR ELECTROSURGERY: EXPERIMENTATION AND MONITORING ALGORITHM DEVELOPMENT, {IMECE2024-150655}

Enrique Velasquez Morquecho - *The University of Texas at Austin*
Hamza Rehman - *The University of Texas at Austin*
Seva Joshi - *The University of Texas at Austin*
Deynna Reyna - *The University of Texas Rio Grande Valley*
Tommy Thompson - *The University of Texas at Austin*
Brian Oak - *The University of Texas at Austin*
Wei Li - *The University of Texas at Austin*

G88. A NEW STEREO VISION TECHNIQUE TO MEASURE THREE-DIMENSIONAL TRAJECTORY OF FLYING WINDBORNE DEBRIS, {IMECE2024-150958}

Kimia Yousefi Anarak - *Colorado State University*
Yanlin Guo - *Colorado State University*
Kurtis Gurley - *University of Florida*
John W Van De Lindt - *Colorado State University*

G89. AUTOMATING CHAIN OF CUSTODY DOCUMENTATION FOR FILTER-BASED AIR POLLUTION SAMPLING, {IMECE2024-150947}

Government Agency Student Poster Presentation
Apurva Iyengar - *Colorado State University*
Christian L'orange - *Colorado State University*

G90. IMPROVING THE INTERLAYER BONDING STRENGTH OF ADDITIVELY MANUFACTURED POLYMER COMPOSITES VIA AN ALTERNATING THERMAL STIMULUS, {IMECE2024-150949}

Leo Allen - *Colorado State University*
Carter Dojan - *Colorado State University*
Mostafa Yourdkhani - *Colorado State University*

G91. RADIATION-INDUCED MECHANICAL PROPERTY CHANGE IN 2D METAL HALIDE PEROVSKITES, {IMECE2024-148697}

Shengjia Zhang - *Texas A&M University*
Merlyn Pulikkathara - *Prairie View A&M University*
Eugenia Vasileiadou - *Northwestern University*
Ioannis Spanopoulos - *University of South Florida*
Mercouri Kanatzidis - *Northwestern University*
Richard Wilkins - *Prairie View A&M University*
Qing Tu - *Texas A&M University*

G92. RAPID AND ENERGY-EFFICIENT MANUFACTURING OF FIBER-REINFORCED COMPOSITE STRUCTURES VIA A NOVEL FILAMENT WINDING APPROACH, {IMECE2024-150989}

Soroush Dashtizad - *Colorado State University*
Rowan Vannier - *Colorado State University*
Walter Jordan - *Colorado State University*
Mostafa Yourdkhani - *Colorado State University*

G93. IMPACT OF HURRICANE IDALIA ON COASTAL WATER AND SEDIMENT QUALITY: FOCUS ON MICROPLASTICS, ORGANIC CARBON, AND HEAVY METALS, {IMECE2024-150990}

Dibya Kanti Datta - *University of Missouri-Columbia*
Alexander Ccanccapa - *University of Missouri-Columbia*
Xiuming Sun - *FAMU-FSU College of Engineering*
Zhengxiao Yan - *FAMU-FSU College of Engineering*
Sumon Hossain Rabby - *FAMU-FSU College of Engineering*
Ebrahim Ahmadisharaf - *FAMU-FSU College of Engineering*
Nasrin Alamdari - *FAMU-FSU College of Engineering*
Maryam Salehi - *University of Missouri-Columbia*

G94. STRONG TEMPERATURE DEPENDENCE OF INTERFACIAL THERMAL RESISTANCE BETWEEN SINGLE-WALLED CARBON NANOTUBE BUNDLE AND SILICON DIOXIDE, {IMECE2024-151010}

Ibrahim Al Keyyam - *Iowa State University*
Xinwei Wang - *Iowa State University*

G95. THE ROLE OF MECHANICAL LOADING IN PHASE TRANSITIONS AND TWIN FORMATION OF TITANIUM ALLOYS, {IMECE2024-151012}

Mehrab Lotfpour - *University of Nevada, Reno*
Amir Hassan Zahiri - *University of Nevada, Reno*
Jamie Ombogo - *University of Nevada, Reno*
Lei Cao - *University of Nevada, Reno*

G96. DYNAMICS OF SPACE-TIME MODULATED BILAYER ELASTIC MOIRE STRUCTURES, {IMECE2024-151014}

Tamanna Akter Jui - *Texas A&M University*
Raj Kumar Pal - *Texas A&M University*

G97. YOUR ROBOT IS A CAVEMAN: USING ROBOTS FOR ARCHAEOLOGICAL, {IMECE2024-151001}

Asma Mohseni - *The University of Tulsa*
Baqer Hassani - *The University of Tulsa*
Juan Reinoso Carbonell - *The University of Tulsa*

G98. SEMICONDUCTIVE 1D MICRO/NANSCALE MATERIALS' THERMAL DIFFUSIVITY CHARACTERIZATION, {IMECE2024-151002}

Amin Karamati - *Iowa State University*
Xinwei Wang - *Iowa State University*

G99. DYNAMIC MIXED-MODE I/II FRACTURE CRITERION OF 3-D PRINTED ABS WITH COMPUTER VISION ASSISTED CRACK INITIATION DETERMINATION, {IMECE2024-151006}

Anya Zakhour - *Community College of Rhode Island/University of Massachusetts, Dartmouth*
Zhuoyuan Leng - *University of Massachusetts, Dartmouth*
Vijaya Chalivendra - *University of Massachusetts, Dartmouth*

G100. HIDDEN BELIEFS IN ENGINEERING VERIFICATION STRATEGIES, {IMECE2024-151065}

Joanna Joseph - *University of Arizona*
Alejandro Salado - *University of Arizona*

G101. DEVELOPING 3D-PRINTED NATURAL FIBER-RICH EARTH MATERIALS IN CONSTRUCTION, {IMECE2024-150796}

Eunjin Shin - *Columbia University*
Olga Carassi - *Columbia University*
Yierfan Maierdan - *Columbia University*
Shiho Kawashima - *Columbia University*
Lola Ben-Alon - *Columbia University*

G102. DATA-DRIVEN SOLUTIONS FOR CO2 SEQUESTRATION AND THERMAL OPTIMIZATION IN ENERGY SYSTEMS, {IMECE2024-148662}

Kashif Liaqat - *Rice University*
Laura Schaefer - *Rice University*

G103. VARIABILITY OF THE FEMORAL NECK AXIS THROUGH THREE-DIMENSIONAL MEASUREMENTS IN INFANT FEMUR, {IMECE2024-149790}

Victoria Melendez - *Embry-Riddle Aeronautical University*
Tamara Chambers - *Embry-Riddle Aeronautical University*
Victor Huayamave - *Embry-Riddle Aeronautical University*

G104. DEVELOPING A CYBER-PHYSICAL INTERSECTION TESTBED FOR AUTONOMOUS VEHICLE ALGORITHMS: SIMULATING REAL-WORLD URBAN TRAFFIC DYNAMICS USING PYTHON, {IMECE2024-150432}

Qi Gao - *Columbia University*
David Eyal - *Columbia University*

G105. ENHANCED DIGITAL TWIN FOR WIND TURBINES: AN ADAPTIVE KALMAN FILTER MODEL BASED ON PARAMETERIZED LINEARIZATION OF SYSTEM DYNAMICS, {IMECE2024-149872}

Ripley Vichot - *The Ohio State University*
Minhyeok Ko - *The Ohio State University*
Jieun Hur - *The Ohio State University*
Abdollah Shafieezadeh - *The Ohio State University*

G106. ATOMISTIC AND MULTI-SCALE SIMULATIONS OF THE DEFORMATION BEHAVIORS OF NANO-TWINNED COPPER WITH ARCHITECTED TEXTURE, {IMECE2024-150185}

Chang Yang - *North Carolina State University*
Thanh Phan - *North Carolina State University*
Liming Xiong - *North Carolina State University*
Yipeng Peng - *University of Wyoming*
Baozhi Cui - *Ames National Laboratory*

G107. ATOMISTIC AND MULTISCALE SIMULATIONS OF THE THZ WAVE-DISLOCATION INTERACTIONS, {IMECE2024-150173}

Thanh Phan - *North Carolina State University*
Liming Xiong - *North Carolina State University*
Chang Yang - *North Carolina State University*
Sunil Chakrapani - *Michigan State University*
Upama Tonny - *Michigan State University*

G108. FREQUENCY-DEPENDENT ELECTRO-DEFORMATION FOR ANALYSIS OF INDIVIDUAL VARIABILITY IN HUMAN BLOOD, {IMECE2024-150296}

Liliana Ponkratova - *Florida Atlantic University*
Hongyuan Xu - *Florida Atlantic University*
E Du - *Florida Atlantic University*

G109. QUANTUM REALM IN CLASSICAL MECHANICS: A NEW BASIS OF TOPOLOGICAL COMPUTING, {IMECE2024-150444}

Kazi Tahsin Mahmood - *Wayne State University*
M. Arif Hasan - *Wayne State University*

G110. ADVANCING AUTOMATED CLASSIFICATION OF CRYSTALLOGRAPHIC STRUCTURES USING SYNTHETIC TWO-DIMENSIONAL X-RAY DIFFRACTION PATTERNS AND DEEP LEARNING, {IMECE2024-151033}

Ayoub Shahnazari - *University of Rochester*
Zeliang Zhang - *University of Rochester*
Sachith Dissanayake - *University of Rochester*
Chenliang Xu - *University of Rochester*
Niaz Abdolrahim - *University of Rochester*

G111. TRANSFORMATION AND POLYMERIZATION OF 0D "BUCKYBALLS" BUCKMINSTERFULLERENES INTO 2D POLYFULLERENES AND GRAPHULLERENES, {IMECE2024-146041}

Keegan Suero - *University of South Florida*
Md Rubayat-E Tanjil - *University of South Florida*
Daiyue Wei - *University of South Florida*
Zhewen Yin - *University of South Florida*
Ossie Douglas - *University of South Florida*
Peter Snapp - *NASA Goddard Space Flight Center*
Huijuan Zhao - *Clemson University*
Michael Cai Wang - *University of South Florida*

G112. EMBEDDED PASSIVE RADIO FREQUENCY SENSING SYSTEM FOR PAVEMENT SUBSURFACE DISPLACEMENT AND MOISTURE MONITORING, {IMECE2024-149887}

Kent Eng - *Princeton University*
Zygmunt Haas - *The University of Texas at Dallas*
Petar Djuric - *Stony Brook University*
Samir Das - *Stony Brook University*
Milutin Stanacevic - *Stony Brook University*
Branko Glisic - *Princeton University*

G113. COMPUTATIONAL ANALYSIS OF FACIAL EXPRESSION PRODUCTION & PERCEPTION FOR AUTISM CANDIDATE BIOMARKER DISCOVERY, {IMECE2024-149890}

Megan Witherow - *Old Dominion University*
Norou Diawara - *Old Dominion University*
Janice Keener - *Children's Hospital of The King's Daughters*
John Harrington - *Children's Hospital of The King's Daughters*
Khan Iftekharuddin - *Old Dominion University*

G114. MICROVOIDING AND CONSTITUTIVE DAMAGE MODELING WITH ARTIFICIAL NEURAL NETWORKS, {IMECE2024-149893}

Huck Beng Chew - *Department of Aerospace Engineering, University of Illinois at Urbana-Champaign*
Ning Li - *Department of Aerospace Engineering, University of Illinois at Urbana-Champaign*

G115. INTERFACIAL TENSION MEASUREMENTS OF DIFLOUROMETHANE (HFC-32), PENTAFLUOROETHANE (HFC-125), AND IONIC LIQUID [C2C1IM][TF2N] SYSTEMS AT ELEVATED PRESSURES AND TEMPERATURES, {IMECE2024-149881}

Julia Espinoza Mejia - *University of Kansas*
Aaron M. Scurto - *University of Kansas*
Mark B. Shiflett - *University of Kansas*

G116 STUDYING FLOW REGULATED PATHOGENESIS OF HYPOPLASTIC LEFT HEART SYNDROME IN A THREE-DIMENSIONAL BIOPRINTED MODEL OF DEVELOPING HUMAN HEART, {IMECE2024-149897}

Linqi Jin - *Emory University & Georgia Institute of Technology*
Sunder Neelakantan - *Texas A&M University*
Shweta Karnik - *Georgia Institute of Technology*
Arnab Dey - *Georgia Institute of Technology*
Reza Avazmohammadi - *Texas A&M University*
Lakshmi Dasi - *Georgia Institute of Technology*
Holly Bauser-Heaton - *Emory University*
Vahid Serpooshan - *Emory University & Georgia Institute of Technology*

G117. CAD-FACILITATED OPTIMIZATION OF A 3D BIOPRINTED HUMAN HEART MODEL, {IMECE2024-149915}

Sarah Fineman - *Emory University*
Linqi Jin - *Emory University and Georgia Institute of Technology*
Vahid Serpooshan - *Emory University and Georgia Institute of Technology*

G118. LIGHT-FIELD FLOW CYTOMETRY: MULTIPARAMETRIC 3D SINGLE-CELL ANALYSIS WITH HIGH-THROUGHPUT, HIGH-RESOLUTION VOLUMETRIC MULTICOLOR IMAGING, {IMECE2024-149919}

Xuanwen Hua - *Georgia Institute of Technology*
Keyi Han - *Georgia Institute of Technology*
Shu Jia - *Georgia Institute of Technology*

G119. MULTI-OBJECTIVE INVERSE DESIGN OF IMPACT RESISTANT METAMATERIALS UNDER VARYING STRAIN RATES, {IMECE2024-149850}

Anish Satpati - *University of California Berkeley*
Marco Maurizi - *University of California Berkeley*
Rayne Zheng - *University of California Berkeley*

G120. SINGLE DROPLET COMBUSTION, {IMECE2024-149816}

Karah Powell - *University of Tennessee at Chattanooga*
Yunye Shi - *University of Tennessee at Chattanooga*

G121. SINGLE-CHAMBERED SOFT ROBOT ACTUATION AND SENSING INTEGRATION, {IMECE2024-149843}

Caroline Schell - *University of Tusla*
John Garrett Williamson - *University of Tulsa*

G122. DATA-DRIVEN INVERSE DESIGN OF MATERIAL SYMMETRY-INDUCED ARCHITECTED CELLULAR MATERIALS., {IMECE2024-145593}

Mohammad Abu-Mualla - *University of Illinois at Chicago*
Jida Huang - *University of Illinois at Chicago*

G123. INVESTIGATION OF 3D-PRINTED ORIGAMI KRESLING CORES IN SANDWICH STRUCTURES, {IMECE2024-149870}

Kira Seshaiah - *Smith College*
Md Shahjahan Hossain - *University of Central Florida*
Omid Bateniparvar - *University of Central Florida*
Ranajay Ghosh - *University of Central Florida*

G124. SAFETY ASSESSMENT OF ADAPTIVE CRUISE CONTROL UNDER EMERGENCY BRAKING SCENARIOS, {IMECE2024-149857}

Abhinav Sharma - *North Carolina State University*
Danjue Chen - *North Carolina State University*

G125. INFORMATION ENCODING AND ENCRYPTION IN ACOUSTIC ANALOGUES OF QUBITS, {IMECE2024-149770}

Akinsanmi Ige - *The University of Arizona*
David Cavalluzzi - *The University of Arizona, Tucson*
Ivan Djordjevic - *University of Arizona*
Keith Runge - *University of Arizona*
Pierre Deymier - *University of Arizona*

G126.PROCESS-STRUCTURE-PROPERTY RELATIONSHIPS IN ADDITIVELY MANUFACTURED ALNICO PERMANENT MAGNETS, {IMECE2024-149762}

Anthony Duong - *Virginia Commonwealth University*
Ian Smith - *Virginia Commonwealth University*
Kyle Snyder - *Commonwealth Center for Advanced Manufacturing*
Omar Bishop - *Virginia Commonwealth University*
Everett Carpenter - *Virginia Commonwealth University*
Radhika Barua - *Virginia Commonwealth University*

G127. COUPLED MULTIPHYSICS FINITE ELEMENT MODELS USING FLUID FLOW, MASS TRANSFER, AND STRUCTURAL DEFORMATION OF IN-VITRO TUMOR MODELS TO ESTIMATE THE SAMPLING VOLUME OF A FINE NEEDLE ASPIRATION BIOPSY, {IMECE2024-149764}

Mary Chase Sheehan - *University of Massachusetts Amherst*
David Schmidt - *University of Massachusetts Amherst*
Govind Srimathveeravalli - *University of Massachusetts Amherst*

G128. ACOUSTIC PROPERTIES OF STRETCHABLE LIQUID METAL-ELASTOMER COMPOSITES FOR MATCHING LAYERS IN WEARABLE ULTRASONIC TRANSDUCER ARRAYS, {IMECE2024-149827}

Ethan Krings - *University of Nebraska-Lincoln*
Benjamin Hage - *University of Nebraska-Lincoln*
Greg Bashford - *University of Nebraska-Lincoln*
Eric Markvicka - *University of Nebraska-Lincoln*

G129. MANAGING CAPACITY FOR CURB SPACES IN URBAN TRANSPORTATION SYSTEM, {IMECE2024-149722}

Yuchi Guo - *University of Michigan - Dearborn*
Armagan Bayram - *University of Michigan - Dearborn*

G130. MULTISCALE MODELING OF ACOUSTOPLASTICITY, {IMECE2024-149717}

Upama Biswas Tonny - *Michigan State University*
Chang Yang - *North Carolina State University*
Liming Xiong - *North Carolina State University*
Sunil K. Chakrapani - *Michigan State University*

G131. 3D PRINTING CERAMICS WITH VASCULAR CHANNELS FOR THERMAL MANAGEMENT AND SELF-HEALING STRUCTURES, {IMECE2024-149728}

Zachary Alsup - *University of Texas at Dallas*
Moein Khakzad - *University of Texas at Dallas*
Sudip Kumar Sarkar - *University of North Texas*
Narendra Dahotre - *University of North Texas*
Majid Minary - *University of Texas at Dallas*

G132. DEVELOPMENT AND EVALUATION OF A TEACHING-LEARNING-PREDICTION-COLLABORATION FRAMEWORK FOR HUMAN-ROBOT COLLABORATIVE ADVANCED MANUFACTURING, {IMECE2024-149729}

Garrett Modery - *Montclair State University*
Weitian Wang - *Montclair State University*

G133. EXCHANGEABLE DYNAMIC BONDS FACILITATED SELF-HEALING BEHAVIOR IN EPOXY VITRIMER: A MOLECULAR DYNAMIC STUDY, {IMECE2024-145098}

Amin Kuhzadmohammadi - *Baylor University*
Ning Zhang - *Baylor University*

G134. BIOFILM GROWTH AND ARCHITECTURE IN POROUS MEDIA ON THE INTERNATIONAL SPACE STATION: EXPLORING THE EFFECT OF GRAVITATIONAL AND INTERFACIAL FORCES ON BIOFILM GROWTH PATTERNS, {IMECE2024-149732}

Julia Lauterbach - *Oregon State University*
Dorthe Wildenschild - *Oregon State University*
Tala Navab-Daneshmand - *Oregon State University*

G135. MICROPLASTIC DETECTION AND QUANTIFICATION IN WATER USING PY-GC/MS METHODOLOGY, {IMECE2024-149733}

Anandu Nair Gopakumar - *University of Missouri-Columbia*
Alexander Ccanccapa-Cartagena - *University of Missouri-Columbia*
Maryam Salehi - *University of Missouri-Columbia*

G136. FROM TRAILHEAD TO SUMMIT: USING NLP TO ANALYZE THRU-HIKERS' WILDERNESS EXPERIENCES, {IMECE2024-149672}

Norhan Abdelgawad - *Virginia Tech University*
Morva Saaty - *Virginia Tech University*
Jaitun V Patel - *Virginia Tech University*
Kris Wernstedt - *Virginia Tech University*
Scott Mccrickard - *Virginia Tech University*
Shalini Misra - *Virginia Tech University*

G137. THE IMPACT OF ROBOTIC SLIP REFLEX TIMING ON PERFORMANCE AND USER EXPERIENCE FOR BODY-POWERED PROSTHESES, {IMECE2024-149674}

Benjamin Davis - *University of California, Berkeley*
Michael Abbott - *University of California, Berkeley*
Hannah Stuart - *University of California, Berkeley*

G138. INVESTIGATION AND OPTIMIZATION OF WATER VAPOR PERMSELECTIVITY OF COPPER-DECORATED CARBON NANOFIBER/POLYVINYLIDENE FLUORIDE MIXED MATRIX MEMBRANES FOR ENHANCED DESALINATION EFFICIENCY, {IMECE2024-149695}

Saketh Merugu - *The University of Toledo*
Anju R Gupta - *University of Toledo*

G139. A HYBRID CROP MODELING APPROACH FOR PREDICTING BIOMASS PRODUCTION OF SORGHUM, {IMECE2024-149607}

Yanbin Chang - *Oklahoma State University*
Ni Zheng - *Oklahoma State University*
Maria G Salas-Fernandez - *Iowa State University*
Lizhi Wang - *Oklahoma State University*

G140. A NOVEL EXPERIMENTAL TECHNIQUE TO DETERMINE THE TACK DEVELOPMENT DURING AUTOMATED PLACEMENT OF UNCURED THERMOSET CARBON/EPOXY TOWS, {IMECE2024-149608}

Debrup Chakraborty - *University of South Carolina*
Karan Kodagali - *University of South Carolina*
Sreehari Rajan Kattil - *University of South Carolina*
Dennis Miller - *University of South Carolina*
Subramani Sockalingam - *University of South Carolina*
Michael A. Sutton - *University of South Carolina*

G141. GUIDED WAVE DISPERSION ANALYSIS-BASED MECHANICAL PROPERTY CHARACTERIZATION FOR ADDITIVE MANUFACTURED STRUCTURES, {IMECE2024-149611}

Bowen Cai - *Mississippi State University*
Hunter Watts - *Mississippi State University*
Chuangchuang Sun - *Mississippi State University*
Luyu Bo - *Virginia Tech*
Wayne Huberty - *Mississippi State University*
Zhenhua Tian - *Virginia Tech*

G142. OPTIMIZATION OF R2R GRAVURE PRINTING PROCESS WITH PRESSURE CONTROL AND CAD SIMULATION, {IMECE2024-149578}

Hannah Kwon - *University of Massachusetts Amherst*
Sam Bui - *University of Massachusetts Amherst*
Connor Mackey - *University of Massachusetts Amherst*
Jingyang Yan - *University of Massachusetts Amherst*
Xiaoning Jin - *Northeastern University*
Xian Du - *University of Massachusetts Amherst*

G143. A MACHINE LEARNING INFORMED PHASE FIELD DAMAGE MODEL TO SIMULATE VOID NUCLEATION AND GROWTH IN METAL MICROSTRUCTURES., {IMECE2024-149585}

Abhijith Thoopul Anantharanga - *Iowa State University*
Jackson Plummer - *Iowa State University*
Saryu Fensin - *Los Alamos National Laboratory*
Brandon Runnels - *Iowa State University*

G144. ADVANCEMENTS IN HYPERSALINE WASTEWATER TREATMENT: THE PROMISE OF QUASI-LIQUID SURFACES TO REDUCE SALT SCALING, {IMECE2024-145064}

Government Agency Student Poster Presentation
Mohammed Imran Khan - *Michigan State Univeristy*
Bei Fan - *Michigan State University*

G145. NONLINEARITIES AND LINEAR DYNAMIC RANGE ACROSS MULTIPLE MODES IN NANOMECHANICAL SENSORS, {IMECE2024-149587}

Monan Ma - *Boston University*
Nathan Welles - *Virginia Tech*
Mark Paul - *Virginia Tech*
Kamil Ekinci - *Boston University*

G146. CARBON REDUCTION OF 3D-INK-EXTRUDED OXIDE POWDERS FOR SYNTHESIS OF EQUIATOMIC COCUFENI MICROLATTICES, {IMECE2024-149598}

Ya-Chu Hsu - *Northwestern University*
Dingchang Zhang - *Northwestern University*
David Dunand - *Northwestern University*

G147. DIRECT DATA-DRIVEN CONTROL OF CONSTRAINED DYNAMICAL SYSTEMS, {IMECE2024-149623}

Ali Kashani - *University of New Mexico*
Ganiyu Azeez - *University of New Mexico*
Claus Danielson - *University of New Mexico*

G148. SELF-LIMITING ELECTROSPRAY DEPOSITION OF NANOPARTICLE COMPOSITES VIA SUB-PERCOLATION ASSEMBLY, {IMECE2024-149657}

Michael Grzenda - *3Spray*
Jouan Yu - *Rutgers University*
Maria Atzampou - *Rutgers University*
Christopher Shuck - *Rutgers University*
Yury Gogotsi - *Drexel Nanomaterials Institute*
Jeffery Zahn - *Rutgers University*
Jonathan Singer - *Rutgers University*

G149. COMPUTATIONAL INVESTIGATION OF UTERINE ADAPTATION AND MECHANICAL FUNCTION DURING PREGNANCY, {IMECE2024-149660}

Emily Hoffmann - *University of Minnesota*
Kyoko Yoshida - University of Minnesota

G150. SYSTEMATIC PROCEDURE FOR CONVERTING A HOLLOW 3D SURFACE SCAN (3DSS) TO A FUNCTIONAL SOLID MODEL FOR THE USE IN FINITE ELEMENT ANALYSIS, {IMECE2024-149524}

Michael Palmieri - *Arizona State University*
Leila Ladani - *Arizona State University*

G151. STRUCTURE-MECHANICAL PROPERTY RELATIONSHIPS OF CERAMIC-IN-POLYMER COMPOSITE SOLID ELECTROLYTE FABRICATED VIA ZIRCONIUM/SULFUR INTERACTION-ASSISTED LAYER-BY-LAYER APPROACH, {IMECE2024-150390}

Zhiming Qiang - *Kennesaw State University*
Tara Joshi - *Kennesaw State University*
Junjun Hu - *Kennesaw State University*
Anish Sankuratri - *Kennesaw State University*
Beibei Jiang - *Kennesaw State University*

G152. NOVEL METHODS FOR PHASE-TRANSFORMATION-ASSISTED TWINNING IN MOLYBDENUM NANOMATERIALS: SIMULATION AND EXPERIMENTAL STUDY, {IMECE2024-150414}

Afnan Mostafa - *University of Rochester*
Linh Vu - *University of Rochester*
Feitao Li - *Technion - Israel Institute of Technology*
Aditya Dey - *University of Rochester*
Hesam Askari - *University of Rochester*
Eugen Rabkin - *Technion - Israel Institute of Technology*
Niaz Abdolrahim - *University of Rochester*

G153. DEVELOPMENT OF A 2-DOF SELF-DECOUPLED CABLE DRIVEN SERIAL ROBOT, {IMECE2024-150441}

Guodong Xiu - *Kent State University*
Tao Shen - *Kent State University*

G154. NUMERICAL ANALYSIS OF CO2-BASED THERMOSYPHONS IN PERMAFROST, {IMECE2024-150443}

Mercedes Chisholm - *Cornell College*
Elizabeth Laughlin - *Clarkson University*
Mohammad Abweny - *Clarkson University*
Suguang Xiao - *Clarkson University*

G155. FIBER SPINNING OF WASTE WIND TURBINE MATERIALS FOR HIGH PERFORMANCE COMPOSITES, {IMECE2024-145114}

Varunkumar Thippanna - *Arizona State University*
Kenan Song - *University of Georgia*

G156. CONTACT BASED NAVIGATION AND COMPACT ACTUATION UNIT DESIGN FOR CONCENTRIC TUBE ROBOTS FOR STRUCTURAL INTEGRITY ASSESSMENT, {IMECE2024-150446}

Parsa Molaei - *Louisiana State University*
Velshunti Thompson - *Louisiana State University*
Jyotsna Sharma - *Louisiana State University*
Hunter Gilbert - *Louisiana State University*

G157. UNDERSTANDING BUBBLE FORMATION ON POROUS SUPERHYDROPHOBIC SURFACES, {IMECE2024-150447}

Dillon Singh - *University of Massachusetts Dartmouth*
Shabnam Mohammadshahi - *University of Massachusetts Dartmouth*
Hangjian Ling - *University of Massachusetts Dartmouth*

G158. LOW VELOCITY IMPACT RESPONSES OF AUXETIC AND NON-AUXEITC CARBON FIBER COMPOSITES, {IMECE2024-150448}

Wenhua Lin - *Syracuse University*
Jason Mack - *University of Akron*
Kwek Tze Tan - *University of Akron*
Barry D. Davidson - *Syracuse University*
Yeqing Wang - *Syracuse University*

G159. UNDERSTANDING THE PINCH-OFF OF A BUBBLE ON SUPERHYDROPHOBIC SURFACES, {IMECE2024-150449}

Isaac Rodriguez - *University of Massachussets Dartmouth*
Daniel O'coin - *University of Massachussets Dartmouth*
Hangjian Ling - *University of Massachussets Dartmouth*

G160. ENHANCED DE-BINDING PROCESS OF DLP 3D-PRINTED CERAMICS COMPONENTS, {IMECE2024-150456}

Mahdi Mosadegh - *The University of Texas at Dallas*
Moein Khakzad - *The University of Texas at Dallas*
Zahra Sepasi - *The University of Texas at Dallas*
Majid Minary-Jolandan - *The University of Texas at Dallas*

G161. FRICTION OF SOFT SOLID SURFACES CREATED BY CONTROLLED FRACTURE, {IMECE2024-150314}

Abrar Ahmed Mohammed - *University of Florida*
Srividhya Sridhar - *University of Illinois*
Shaobo Zhan - *University of illinois*
Hutchens Shelby - *University of illinois*
Alison C. Dunn - *University of Florida*

G162. MULTI-RESONATOR ACOUSTIC MUFFLER FOR BROADBAND FREQUENCY ATTENUATION, {IMECE2024-150306}

Joshua Lloyd - *Rowan University*
Chen Shen - *Rowan University*

G163. HUMAN-AUTOMATED VEHICLE INTERACTIONS: VOLUNTARY DRIVER INTERVENTION, {IMECE2024-150307}

Xinzhi Zhong - *University of Wisconsin-Madison*
Yang Zhou - *Texas A&M University*
Amudha Varshini Kamaraj - *University of Wisconsin-Madison*
Zhenhao Zhou - *University of Wisconsin-Madison*
Wissam Kontar - *University of Wisconsin-Madison*
Dan Negrut - *University of Wisconsin-Madison*
John Lee - *University of Wisconsin-Madison*
Soyoung Ahn - *University of Wisconsin-Madison*

G164. ENHANCING THE LONGEVITY OF SILICON ELECTRODE LITHIUM-ION BATTERIES WITH FLUOROETHYLENE CARBONATE, {IMECE2024-150275}

Andrei Proca - *Texas A&M University*
Koffi Pierre Yao - *University of Delaware*

G165. FINITE ELEMENT MODELING OF SEISMOCARDIOGRAM SIGNALS FOR ENHANCED SCREENING OF CONGENITAL HEART DISEASES, {IMECE2024-150280}

Mohammadali Monfared - *Mississippi State University*
Peshala Thibbotuwawa Gamage - *Florida Institute of Technology*
William Van Wurm - *University of Mississippi School of Medicine (currently working at Mississippi Pediatric Associates)*
Bahram Kakavand - *Nemours Children's Hospital, Florida*
Amirtaha Taebi - *Mississippi State University*

G166. LEARNING THE GOVERNING EQUATIONS OF DIFFUSION IN SOLIDS FROM ATOMISTIC SIMULATIONS, {IMECE2024-145208}

Wongelemengist Nadew - *Utah State University*
Haoran Wang - *Utah State University*

G167. PREDICTING CREATIVITY RATINGS ON CONCEPTUAL DESIGN IDEAS USING EYE-TRACKING DATA, {IMECE2024-150284}

Duk Hee Ka - *The Pennsylvania State University*
Scarlett Miller - *The Pennsylvania State University*
Farnaz Tehranchi - *The Pennsylvania State University*

G168. 3D RECONSTRUCTION OF MILLET PLANTS USING NEURAL RADIANCE FIELDS, {IMECE2024-150336}

Shambhavi Joshi - *Iowa State University*
Mozhgan Hadadi - *Iowa State University*
Juan I. Di Salvo - *Iowa State University*
Asheesh K Singh - *Iowa State University*
Adarsh Krishnamurthy - *Iowa State University*

G169. MCROS: A DUAL-ARM ALL-TERRAIN MULTIMODAL COLLABORATIVE ROBOT SYSTEM FOR HUMAN-CENTERED TASKS, {IMECE2024-150367}

Maxim Lyons - *Montclair State Unviersity*
Weitian Wang - *Montclair State University*

G170. FROM PIPELINE FAILURE INCIDENTS TO ACTIONABLE INSIGHTS: SIMULATING FAILURE PROPAGATION USING SAINT®, {IMECE2024-150379}

Yasir Mahmood - *North Dakota State Univeristy*
Ying Huang - *North Dakota State University*

G171. ASSESSING THE CYBERSECURITY OF CONNECTED 3D PRINTERS, {IMECE2024-150569}

Ankush Mishra - *Iowa State University*
Shi Yong Goh - *Iowa State University*
Adarsh Krishnamurthy - *Iowa State University*

G172. HIGH FIDELITY TEMPERATURE CONTROL IN AIRCRAFT AVIONICS USING THERMOELECTRIC AND CONVECTION COOLING, {IMECE2024-150570}

Urban Michaels - *Kennesaw State University*
Hikari Inaoka - *Pennsylvania State University*
Emily Boyd - *Washington University*
Matthew Fitzgerald - *The Boeing Company*

G173. TOOL GRASPING COMPLIANCE AND STABILITY OF UNDERACTUATED HANDS, {IMECE2024-150534}

Qianwen Zhao - *Stevens Institute of Technology*
Long Wang - *Stevens Institute of Technology*

G174. LEARNING-FINDING-GIVING: A NATURAL VISION-SPEECH-BASED APPROACH FOR ROBOTS TO ASSIST HUMANS IN HUMAN-ROBOT COLLABORATIVE MANUFACTURING CONTEXTS, {IMECE2024-150576}

Emilio Herrera - *Montclair State University*
Weitian Wang - *Montclair State University*

G175. TEAM SITUATION AWARENESS BETWEEN HUMAN-AI TEAMING TO ENABLE ADHD WORKFORCE PARTICIPATION IN THE FUTURE CONSTRUCTION SITE, {IMECE2024-150585}

Behzad Esmaeili - *Industrial Engineering*
Ching-Yu Cheng - *Industrial Engineering*

G176. THE DETAILED SYNTHESIS PROCESS DETERMINES THERMOMECHANICAL BEHAVIORS OF A LIQUID CRYSTAL ELASTOMER, {IMECE2024-150586}

Zhengxuan Wei - *Northeastern University*
Umme Hani Bootwala - *Northeastern University*
Ruobing Bai - *Northeastern University*

G177. EXPANDING THE SENSING RESOLUTION AND ANALYTE RANGE FOR DE NOVO PEPTIDE AND PROTEIN SEQUENCING VIA ÅNGSTRÖM-PRECISE NANOPORATION IN ATOMICALLY-THIN 2D DIELECTRICS, {IMECE2024-144088}

Darley (Daiyue) Wei - *University of South Florida*
Zhewen Yin - *University of South Florida*
Ossie Douglas - *University of South Florida*
Muhammad Shahbaz Rafique - *University of South Florida*
Ashley Valestin - *University of South Florida*
Michael Cai Wang - *University of South Florida*

G178. EFFECTS OF INFLOW CONDITIONS ON THE AEROSOL DEPOSITION CHARACTERISTICS IN HUMAN AIRWAYS, {IMECE2024-150554}

Jacob Pratt - *University of Tennessee at Chattanooga*
Reetesh Ranjan - *University of Tennessee at Chattanooga*

G179. REPEATEDLY SOLVING SIMILAR SIMULATION-OPTIMIZATION PROBLEMS: INSIGHTS FROM DATA FARMING, {IMECE2024-150547}

Nicole Felice - *North Carolina State University*
David Eckman - *Texas A&M University*
Susan Sanchez - *Naval Postgraduate School*
Sara Shashaani - *North Carolina State University*

G180. A MATHEMATICAL MODEL FOR FAST DETERMINATION OF PERMEABILITIES OF TIGHT RESERVOIR CORES FROM THE INITIAL PERIOD OF THE PULSE DECAY TEST, {IMECE2024-150548}

Anh Tay Nguyen - *Northwestern University*
Pouyan Asem - *University of Minnesota Twin Cities*
Yang Zhao - *Northwestern University*
Zdenek Bazant - *Northwestern University*

G181. DATA-DRIVEN APPROACH TO ASSESS GREEN STORMWATER INFRASTRUCTURE (GSI) PERFORMANCE, {IMECE2024-150542}

Musfiqur Rahman - *Villanova University*
Bridget Wadzuk - *Villanova University*
Peleg Kremer - *Villanova University*
Xun Jiao - *Villanova University*
Achira Amur - *Villanova University*
Madeline Scolio - *Villanova University*
Ruixuan Wang - *Villanova University*
Virginia Smith - *Villanova University*

G182. CYCLOPAMINE DOSING IN AN EMBRYONIC CHICKEN MODEL INDUCES DECREASED BLOOD FLOW VELOCITY AND CONFORMATIONAL CHANGES IN THE DEVELOPING HEART OUTFLOW TRACT, {IMECE2024-150524}

Nathan Petrucci - *Oregon Health and Science University*
Rachel Opferman - *Oregon Health and Science University*
Makena Phillips - *Oregon Health and Science University*
Sandra Rugonyi - *Oregon Health and Science University*

G183. MECHANOTRANSDUCTION OF CELLULAR PRE-STRESS IS SUFFICIENT TO DRIVE FIBROBLAST-TO-MYOFIBROBLAST TRANSITIONS, {IMECE2024-150507}

Vasuretha Chandar - *Northeastern University*
Benjamin Goykadosh - *Northeastern University*
Harikrishnan Parameswaran - *Northeastern University*

G184. BAYESIAN NETWORK FRAMEWORK FOR WIND RISK ASSESSMENT: MODELING SPATIAL CORRELATION OF TROPICAL CYCLONE WIND FIELDS, {IMECE2024-150514}

Amirreza Mohammadi - *University of Maryland*
Michelle Bensi - *University of Maryland*

G185. EXPERIMENTAL INVESTIGATION OF THE FRACTURE BEHAVIOR OF CELLULOSE NANOPAPER UNDER QUASI-STATIC AND DYNAMIC LOADING., {IMECE2024-150466}

Azeez Adebayo - *Auburn University*
Hareesh Tippur - *Auburn University*

G186. DIFFERENTIATING DYNAMIC SYSTEM OUTCOMES THROUGH SONIFICATION, {IMECE2024-150490}

Duncan Turley - *Portland State University*
Jonathan Snyder - *Unaffiliated*
Samantha Hartzell - *Portland State University*

G187. FINITE ELEMENT NANOINDENTATION SIMULATIONS FOR CHARACTERIZING MATERIAL EXTREMES: IDENTIFYING SPHERICAL INDENTER GEOMETRY AT SHALLOW DEPTHS, {IMECE2024-150501}

Munireach Nannory - *University of Tennessee, Knoxville*
Vivek Chawla - *Ut Institute For Advanced Materials & Manufacturing*
Timothy Truster - *University of Tennessee, Knoxville*

G188. STRAIN-ENGINEERED PARTICLE DIFFUSION IN UNIAXIALLY DEFORMED POLYMER NETWORKS, {IMECE2024-143540}

Jiabin Liu - *Michigan State University*
Shaoting Lin - *Michigan State University*

G189. DYNAMIC DEFORMATION OF PDMS STAMPS IN ROLL-TO-ROLL MICROCONTACT PRINTING, {IMECE2024-150503}

Huarui Du - *University of Massachusetts Amherst*
Hannah Kwon - *University of Massachusetts Amherst*
Isabella Lambros - *University of Massachusetts Amherst*
Iiya Mccune-Pedit - *University of Massachusetts Amherst*
Jingyang Yan - *University of Massachusetts Amherst*
Xian Du - *University of Massachusetts Amherst*

G190. GREENHOUSE ENERGY SAVINGS BY PHOTOTHERMAL PLASMONIC NANOPARTICLE COATINGS, {IMECE2024-150495}

Mohammad Elmi - *Pennsylvania State University*
Enhe Zhang - *Pennsylvania State University*
Julian Wang - *Pennsylvania state University*

G191. MULTISCALE MECHANICS OF ADAPTIVE HIERARCHICAL GRANULAR METAMATERIALS FOR TUNABLE IMPACT MITIGATION, {IMECE2024-150479}

Prajwal Bharadwaj - *Worcester Polytechnic Institute*
Nikhil Karanjgaokar - *Worcester Polytechnic Institute*

G192. CHOLINE AMINO ACID IONIC LIQUID: TRIBOLOGICAL PERFORMANCE AS A LUBRICANT ADDITIVE TO POLAR AND NON-POLAR BASE OILS, {IMECE2024-150469}

Davis Kiboi - *Rochester Institute of Technology*
Esmond Lau - *Rochester Institute of Technology*
Moni Chavez - *Rochester Institute of Technology*
Filippo Mangolini - *The University of Texas at Austin*
Patricia Iglesias - *Rochester Institute of Technology*

G193. SMOOTH CRACK BAND MODEL BASED ON SPRESS-SPRAIN RELATION, {IMECE2024-150041}

Houlin Xu - *Northwestern University*
Anh Nguyen - *Northwestern University*
Zdenek Bazant - *Northwestern University*

G194. OPERATIONS WITH A MECHANICAL PLATFORM: ACOUSTIC ANALOGUES OF QUBITS, {IMECE2024-150081}

David Cavalluzzi - *University of Arizona*
Akinsanmi Ige - *University of Arizona*
Keith Runge - *University of Arizona*
Pierre Deymier - *University of Arizona*

G195. MULTI-LAYERED ADDITIVE MANUFACTURING FOR DEVICE FABRICATION, {IMECE2024-150084}

Chloe Kekedjian - *Boston University*
John William Boley - *Boston University*

G196. DESIGNING LIQUID METAL MICROSTRUCTURES FROM SPHERICAL TO ELLIPSOIDAL INCLUSIONS VIA DIRECT INK WRITING, {IMECE2024-150092}

Ohnyoung Hur - *Virginia Tech*
Ravi Tutika - *Virginia Tech*
Eric Markvicka - *University of Nebraska–Lincoln*
Michael Bartlett - *Virginia Tech*

G197. NONLINEAR DYNAMICS AND CHAOTIC VIBRATIONS IN BIOMIMETIC SCALE METAMATERIALS, {IMECE2024-150094}

Omid Bateniparvar - *University of Central Florida*
Ranajay Ghosh - *University of Central Florida*

G198. INFLUENCE OF NON-UNIAXIAL BENDING ON TWINNING AND PHASE TRANSFORMATION IN MOLYBDENUM NANOWIRES, {IMECE2024-150077}

Sicheng Qian - *University of Rochester*
Afnan Mostafa - *University of Rochester*
Feitao Li - *Technion - Israel Institute of Technology*
Eugen Rabkin - *Technion - Israel Institute of Technology*
Niaz Abdolrahim - *University of Rochester*

TRACK 17: RESEARCH POSTERS

NOVEMBER 20TH
12:00PM–3:00PM - EXHIBIT HALL A

Track Organizer: **Caterina Rizzi**, *University of Bergamo & Shima Hajmirza, Stevens Institute of Technology*

R1. INVESTIGATION OF THE STACK EFFECT ON THE IMPACT OF THE OUTDOOR AIR QUALITY ON THE INDOOR ENVIRONMENT, {IMECE2024-146462}

Yasir Mohieldeen - *Hamad Bin Khalifa University (HBKU)*

R2. JOINT RADIATION AND RECOMBINATION IN NANOPOROUS THIN FILM SOLAR CELLS USING PHYSICS INFORMED DEEP LEARNING APPROACH ABSTRACT., {IMECE2024-146279}

Farhin Tabassum - *Stevens Institute of Technology*

R3. CARRIER CONTROLLABILITY IN TWO-DIMENSIONAL TRANSITION METAL DICHALCOGENIDES, {IMECE2024-145103}

Henry Fischer - *University of St Thomas*
Srajan Pillai - *University of St Thomas*
Jeong Ho You - *University of St Thomas*
Sewon Park - *Purdue University*
Jong Hyun Choi - *Purdue University*

R4. OPTIMIZING HYDROPONIC SYSTEMS: INTEGRATING WATER FLOW, ROOT GROWTH, AND CONTAINER DESIGN FOR EFFICIENT PLANT PRODUCTION – A LITERATURE REVIEW AND NEW HYPOTHESIS, {IMECE2024-150870}

Orlando Ayala - *Old Dominion University*
Jose Isaias Salas Salas-Hernández - *Universidad ECCI*

R5. A REGIONAL HYDROGEN RESILIENCY CONCEPT, {IMECE2024-150862}

Sumit Chanda - *The University of Texas at El Paso*
Afsana Mustari Itul - *The University of Texas at El Paso*
Safwan Shafquat - *The University of Texas at El Paso*
Anika Tasnim - *The University of Texas at El Paso*
Ahmed Ann Noor Ryen - *The University of Texas at El Paso*
Nawshad Arslan Islam - *The University of Texas at El Paso*

R6. COHERENT AND INCOHERENT PHONON HEAT CONDUCTION IN SILICON POROUS THIN FILM, {IMECE2024-150851}

Haoran Cui - *University of Nevada, Reno*
Theodore Maranets - *University of Nevada, Reno*
Tengfei Ma - *University of Nevada, Reno*
Yan Wang - *University of Nevada, Reno*

R7. ANALYSIS OF REAL FLUID THERMODYNAMIC NONLINEARITIES ON TURBULENT MIXING IN SUPERCRITICAL FLUIDS, {IMECE2024-150903}

S M Al Mamun Or Roshid - *Prairie View A&M University*
Joseph Oefelein - *Georgia Institute of Technology*
Ziaul Huque - *Prairie View A&M University*

R8. IN SITU ROBOTIC FABRICATION OF LIGAMENTS FOR THE REHABILITATION OF PROSTHETIC FINGER JOINTS UTILIZING A 6-DOF PLATFORM, {IMECE2024-150916}

Richard M. Gonzalez - *Rochester Institute of Technology*
Jun Han Bae - *Rochester Institute of Technology*

R9. INVERSE PREDICTION OF MULTIMODE HEAT TRANSFER IN A FIBROUS POROUS SUBSTRATE DURING DIRECT SOLAR METHANE PYROLYSIS, {IMECE2024-150849}

Hengrui Xu - *University of California, Los Angeles*
Timothy Fisher - *University of California, Los Angeles*

R10. VISCOELASTIC AND TRIBOLOGICAL RESPONSES OF BALLISTIC MECHANICAL METASURFACES, {IMECE2024-150784}

Zongling Ren - *University of Massachusetts Amherst*
Junce Cheng - *University of Massachusetts Amherst*
Tingyi "Leo" Liu - *University of Massachusetts Amherst*
Jae-Hwang Lee - *University of Massachusetts Amherst*

R11. RESEARCH AND DEVELOPMENT OF SURFACE-BONDED PZT INSTALLATION TECHNIQUES, {IMECE2024-150813}

Greg Dreyer - *Penn State*
Mariya Pozhanka - *New Mexico Tech*
Andrei Zagrai - *New Mexico Tech*

R12. THE ROLE OF SENSOR TECHNOLOGY AND SOCIAL KNOWLEDGE IN TRANSFORMING CACAO FERMENTATION: CASE STUDY HALLBAR KAKAO 2.0, {IMECE2024-150797}

Mauren S. Cárdenas Fontecha - *Universidad Autónoma de Bucaramanga*
Sebastian Roa Prada - *Universidad Autónoma de Bucaramanga*
Leonardo H. Talero Sarmiento - *Universidad Autónoma de Bucaramanga*

R13. DEXTEROUS SOFT ROBOTIC HAND WITH RICH SENSING FEEDBACK, {IMECE2024-150646}

Youwen Liang - *University of Arkansas*
Wan Shou - *University of Arkansas*
Ariadna Ramirez-Lazaro - *University of Arkansas*

R14. STRUCTURAL HEALTH MONITORING OF WIND TURBINE BLADES UTILIZING GUIDED WAVES, {IMECE2024-145387}

Runye Lu - *Shanghai Jiao Tong University*
Yanfeng Shen - *Shanghai Jiao Tong University*

R15. STREAMLINING MUSCLE FORCE ESTIMATION: SIMPLIFIED COST FUNCTIONS MEET ADVANCED MUSCLE MODELS, {IMECE2024-150597}

Muhammad Hassaan Ahmed - *University of California Merced*
Jacques-Ezechiel N'guessan - *University of California Merced*
Ranjan Das - *University of California Merced*
Matthew Leineweber - *BIOMOTUM, Inc.*
Sachin Goyal - *University of California Merced*

R16. DECENTRALIZED NEAR-OPTIMAL CONTROL OF MULTIPLE DRONES USING SNAC, {IMECE2024-150609}

Haniel Youlesivanson - *California State University Northridge*
Tohid Sardarmehni - *California State University Northridge*

R17. MACHINE LEARNING (ML) APPROACH TO PREDICT THE VISCOSITY OF IONIC LIQUIDS (ILS) BASED NANOFLUIDS, {IMECE2024-150704}

Turner Peeples - *University of South Carolina Aiken*
Truman Brabham - *University of South Carolina Aiken*
Jamil Khan - *University of South Carolina*
Titan Paul - *University of South Carolina Aiken*

R18. MOISTURE ACTUATED TUNABLE PHASE CHANGE MATERIALS FOR ALL-SEASON BUILDING THERMAL COMFORT CONTROL, {IMECE2024-150708}

Roma Avhad - *The University of Texas at Dallas*
Lyu Zhou - *The University of Texas at Dallas*
Shuang Cui - *The University of Texas at Dallas*

R19. DEVELOPMENT OF PASTE EXTRUSION APPARATUS FOR ADDITIVE MANUFACTURING OF TRANSVERSE THERMOELECTRIC STRUCTURES, {IMECE2024-150714}

Weixiao Gao - *Temple University*
Fei Ren - *Temple University*

R20. DEVELOPMENT OF A HIGH-FIDELITY CAD MODEL OF THE FEMALE FOOT USING COMPUTED TOMOGRAPHY DATA, {IMECE2024-150716}

Carlos Hernandez Ortiz - *University of North Florida*
Muhammad Mahdi Nabi - *University of North Florida*
Alexandra Schonning - *University of North Florida*
Jutima Simsiriwong - *University of North Florida*

R21. CHARACTERIZATION OF CARBON FIBER REINFORCED POLYPHENYLENE SULFIDE (CF/PPS) COMPOSITES., {IMECE2024-150725}

Nitin More - *North Carolina Agricultural And Technical State University*
Ram Mohan - *North Carolina Agricultural And Technical State University*

R22. METAL ADDITIVE MANUFACTURING - MACHINE LEARNING ANALYSIS AND INFERENCES ON THE PROCESS PARAMETERS AND MATERIAL CHARACTERISTIC, {IMECE2024-150747}

Nikhil Ingle - *NC A&T State University*
Ram Mohan - *NC A&T State University*

R23. GENERATION AND ANALYSIS OF ELECTRIC VEHICLE SYNTHETIC DRIVING DATA, {IMECE2024-150735}

Efe Savran - *Bursa Uludag University*
Onur Can Kalay - *Texas Tech*
Fatih Karpat - *Bursa Uludag University*
Stephen Ekwaro-Osire - *Texas Tech*

R24. EVALUATION OF GRAPHICS PROCESSING UNITS (GPUS) PERFORMANCE OF ICE-SHEET AND SEA-LEVEL SYSTEM MODEL FLOW SOLVER, {IMECE2024-150739}

Kenneth Mosley - *University of North Dakota*
Anjali Sandip - *University of North Dakota*
Mathieu Morlighem - *Dartmouth College*

R25. THERMAL ANALYSIS OF CAPACITIVE CHARGING PADS FOR ELECTRIFIED ROADWAYS, {IMECE2024-144321}

Karmen Teuscher - *Utah State University*
Dheeraj Kumar Reddy Etta - *Cornell University*
Khurram Khan Afridi - *Cornell University*
Nicholas Roberts - *Utah State University*

R26. ADHESION OF IMPURE ICE ON SURFACES, {IMECE2024-150946}

Christopher Carducci - *University Illinois Chicago*
Rukmava Chatterjee - *Carrier Corporation*
Rajith Unnikrishnan Thanjukutty - *Abbott Molecular Inc.*
Arnab Neogi - *University Illinois Chicago*
Suman Chakraborty - *Argonne National Laboratory*
Vijay Prithiv Bathey Ramesh Bapu - *Ansys Inc.*
Suvo Banik - *University Illinois Chicago*
Subramanian K. R. S. Sankaranarayanan - *University Illinois Chicago*
Sushant Anand - *University Illinois Chicago*

R27. WASTE WOOD-DERIVED COMPOSITE FOR ENERGY-EFFICIENT THERMAL MANAGEMENT OF BUILDINGS THROUGH RADIATIVE COOLING AND THERMAL ENERGY STORAGE, {IMECE2024-150971}

Bernadette Magalindan - *The University of Texas at Dallas*
Lyu Zhou - *The University of Texas at Dallas*
Zhihao Ma - *The University of Utah*
Sahag Bozoian - *The University of Houston*
Bo Zhao - *The University of Houston*
Jianli Chen - *The University of Utah*
Shuang Cui - *The University of Texas at Dallas*

R28. A TRANSPARENT PHASE CHANGE HYDROGEL WINDOW FOR ENERGY EFFICIENT BUILDING THERMAL REGULATION, {IMECE2024-150977}

Lyu Zhou - *The University of Texas at Dallas*
Zainab Faheem - *The University of Texas at Dallas*
Shuang Cui - *The University of Texas at Dallas*

R29. ENHANCING CONVECTIVE HEAT TRANSFER ON GRAPHENE NANOCHANNELS USING FUNCTIONAL GROUPS, {IMECE2024-150966}

Milad Nasiri - *University of Nevada, Reno*
Haoran Cui - *University of Nevada, Reno*
Yan Wang - *University of Nevada, Reno*

R30. LASER VIBROMETRY AND WAVENUMBER ANALYSIS ENABLED MECHANICAL PROPERTIES CHARACTERIZATION FOR ADDITIVELY MANUFACTURED THERMOSET COMPOSITES, {IMECE2024-150981}

Bowen Cai - *Mississippi State University*
Hunter Watts - *Mississippi State University*
Chuangchuang Sun - *Mississippi State University*
Jiali Li - *Virginia Tech*
Wayne Huberty - *Mississippi State University*
Zhenhua Tian - *Virginia Tech*

R31. COUPLED TOPOLOGY OPTIMIZATION AND PATH PLANNING IN CONTINUOUS FIBER COMPOSITES, {IMECE2024-151648}

Chuan Luo - *Columbia University*

R32. ASSESSING RAIL DAMAGE IN TURNS DUE TO LATERAL LOAD TRANSFER, {IMECE2024-137425}

Frank Otremba - *Federal Institute For Material Research and Testing*
Jose A. Romero Navarrete - *Queretaro Autonomous University*

R33. EVALUATION OF IRREGULAR MOTION IN ENDOVASCULAR TREATMENT, {IMECE2024-143973}

Kengo Kobayashi - *Division of Mechanical Engineering, Graduate School of Science and Technology for Innovation, Yamaguchi University*
Kazuto Takashima - *Department of Biological Functions Engineering, Graduate School of Life Science and Systems Engineering, Kyushu Institute of Technology*
Naoki Toma - *Department of Neurosurgery, Mie University Graduate School of Medicine*
Koji Mori - *Division of Mechanical Engineering, Graduate School of Science and Technology for Innovation, Yamaguchi University*

R34. LH2 TANKS IN FIRE INCIDENTS - THE CRYOGENIC HIGH TEMPERATURE THERMAL VACUUM CHAMBER ENABLES IN-DEPTH INSIGHTS, {IMECE2024-144417}

Robert Eberwein - *Bundesanstalt für Materialforschung und -prüfung (BAM)*
Giordano Emrys Scarponi - *Alma Mater Studiorum - Università di Bologna*
Valerio Cozzani - *Alma Mater Studiorum - Università di Bologna*
Frank Otremba - *Bundesanstalt für Materialforschung und -prüfung (BAM)*

R35. DISC GOLF MATERIALS STRENGTH AND COMPOSITION, {IMECE2024-144706}

Matthew Muse - *Western Kentucky University*

R36. SMALL PUNCH TEST-BASED FATIGUE DAMAGE ASSESSMENT, {IMECE2024-143445}

Sangyeop Kim - *Sungkyunkwan University*
Moon Ki Kim - *Sungkyunkwan University*

R37. DEEP LEARNING ASSISTED DESIGN OPTIMIZATION OF POROUS STRUCTURE FOR ENHANCED MULTIPHASE HEAT TRANSFER WITH OSCILLATING FLOW, {IMECE2024-144933}

Lichang Zhu - *University of Houston*
Ben Xu - *University of Houston*

R38. THERMAL MANAGEMENT OF AXIAL FLUX PERMANENT MAGNET MOTORS IN NEXT-GENERATION AIRCRAFT, {IMECE2024-151641}

Harry Lance - *Hendrix College*
Shiyu Zhang - *Texas A&M University*
Dion Antao - *Texas A&M University*

R39. DEVELOPING NOVEL COHERENCE MEASURES FOR SYSTEMS WITH MULTIPLE CORRELATED INPUTS: THEORY AND APPLICATION TO THE STUDY OF PATHOLOGICAL TREMOR, {IMECE2024-143689}

Nolan Howes - *Brigham Young University*
Matthew Allen - *Brigham Young University*
Dario Farina - *Imperial College London*
Steven Charles - *Brigham Young University*

R40. THE ACORN MODEL IN AN ONLINE ENVIRONMENT, {IMECE2024-144120}

Mysore Narayanan - *Miami University*

R41. PROMOTING CREATIVE CRITICAL THINKING IN AN ONLINE ENVIRONMENT, {IMECE2024-144121}

Mysore Narayanan - *Miami University*

R42. 3D PHASE-FIELD MODELING OF ALUMINUM FOAM, {IMECE2024-144145}

Chaimae Jouhari - *South Dakota State University*
Yucheng Liu - *South Dakota State University*

R43. THE EFFECT OF TENSION ON THE MASS LOSSES AND MODULI DEGRADATION OF BIOMED AND SURGICAL GUIDE RESIN MADE BY 3D STEREOLITHOGRAPHY AND BURIED INTO POTTING SOIL, {IMECE2024-144620}

Ariful Bhuiyan - *University of Houston at Clear Lake*
Allison Oladovich - *University of Houston Clear Lake*
Bryan Leon - *University of Houston Clear Lake*

R44. CONVOLUTION FINITE ELEMENT LEVEL SET METHOD: APPLICATION TO ADDITIVE MANUFACTURING SIMULATIONS, {IMECE2024-144458}

Chaoqian Yuan - *University of Maryland Baltimore County*
Ye Lu - *University of Maryland Baltimore County*

R45. A REPRESENTATIVE ELEMENTARY VOLUME STUDY: THE MECHANICAL EFFECT OF THE INCLUSION OF CARBON NANOTUBE ON ZINC-SILVER OXIDE., {IMECE2024-146775}

Ariful Bhuiyan - *University of Houston Clear Lake*
Mina Yoon - *Oak Ridge National Laboratory*
Victor Guevara - *University of Houston Clear Lake*

R46. DESIGN AND FABRICATION OF BONE-LIKE COMPOSITE TISSUE SCAFFOLDS USING NUCLEAR PASTA DESIGN THEORY, {IMECE2024-139668}

Hamzeh Al-Qawasmi - *Marshall University*
Roozbeh (Ross) Salary - *Marshall University (West Virginia State)*

R47. A CONVOLUTIONAL NEURAL NETWORK MODEL FOR IN SITU CHARACTERIZATION OF MATERIAL DEPOSITION QUALITY IN ADDITIVE FABRICATION OF BONE SCAFFOLDS WITH COMPLEX MICROSTRUCTURE, {IMECE2024-139664}

Ethan O'malley - *Marshall University*
Roozbeh (Ross) Salary - *Marshall University (West Virginia State)*

R48. INDOOR DAYLIGHT ANALYSIS OF WINDOW USED IN HISTORIC BUILDINGS, {IMECE2024-140723}

Esam Alawadhi - *Kuwait University*

R49. STREAMWISE VELOCITY DECOMPOSITION IN RIBLET SURFACES - COMPARISON BETWEEN DIFFERENT DIRECT NUMERICAL SIMULATION DOMAIN SIZES, {IMECE2024-142000}

Alexander Ramirez Garcia - *Portland State University - Maseeh College of Engineering and Computer Science*
Bianca Viggiano - *Polytechnique Montréal - Department of Mechanical Engineering*
Xiaowei Zhu - *Portland State University - Maseeh College of Engineering and Computer Science*

R50. STUDY ON TENSILE PROPERTIES OF ELECTRO SPUN POLY ETHYLENE OXIDE NANOFIBERS COUPLED WITH TITANIUM DI OXIDE NANOPARTICLES, {IMECE2024-141942}

Ariful Bhuiytan - *University of Houston at Clear Lake*
Victor Guevara - *University of Houston Clear Lake*
David Cardozo - *University of Houston Clear Lake*
Tej Limbu - *University of Houston Clear Lake*
Serkan Caliskan - *University of Houston Clear Lake*
Mackenzie Songsart-Power - *University of Houston Clear Lake*

R51. THERMAL PROPERTIES OF CARBON NANOTUBES REINFORCED EPOXY MATRIX COMPOSITES BY MOLECULAR DYNAMIC SIMULATIONS, {IMECE2024-142367}

Lida Najmi - *South Dakota State University*
Zhong Hu - *South Dakota State University*

R52. PREDICTION OF FRICTION COEFFICIENT OF FORKLIFTS BY GENETIC ALGORITHM AND LONG SHORT-TERM MEMORY, {IMECE2024-142473}

Seungwoon Park - *Inha University*
Chul-Hee Lee - *Inha University*

R53. ENHANCING THE ACCURACY OF MACHINERY FAULT DIAGNOSIS THROUGH FAULT SOURCE ISOLATION OF COMPLEX MIXTURE OF INDUSTRIAL SOUND SIGNALS, {IMECE2024-143231}

Ayantha Senanayaka - *Center for Advanced Vehicular Systems at Mississippi State University*
Philku Lee - *Korea Automotive Technology Institute*
Nayeon Lee - *Center for Advanced Vehicular Systems at Mississippi State University*
Charles Dickerson - *US Army Corps of Engineers Engineer Research and Development Center*
Anton Netchaev - *US Army Corps of Engineers Engineer Research and Development Center*
Sungkwang Mun - *Center for Advanced Vehicular Systems at Mississippi State University*

R54. SELECTIVE FLOPPY MODE TRIGGERING IN KAGOME CHAINS, {IMECE2024-143257}

Poster Presentation
Pegah Azizi - *University of Minnesota*
Stefano Gonella - *University of Minnesota*

R55. A PILOT STUDY ON THE FORCE AND TORQUE PROFILES DURING THE MECHANICAL FASTENING PROCESS ON HYBRID AEROSPACE STRUCTURE JOINING, {IMECE2024-149822}

Chris Miskell - *Washington State University Vancouver*
Dr. Pardeep Pankaj - *Washington State University Vancouver*
Dr. Dave Kim - *Washington State University Vancouver*

R56. MULTI-SCALE MODELING AND EXPERIMENTAL ANALYSIS OF 0.8 WT% Y2O3-STRENGTHENED SS316L ODS ALLOYS FABRICATED VIA LPBF, {IMECE2024-147102}

Seongun Yang - *Oregon State University*
Zhengming Wang - *Oregon State University*
Kwangtae Son - *Oregon State University*
Donghua Xu - *Oregon State University*
Marc Albert - *Electric Power Research Institute*
Somayeh Pasebani - *Oregon State University*

R57. MULTI-CLASS DEFECT IDENTIFICATION AND LOCALIZATION IN CFRP COMPOSITE MATERIAL USING INFRARED IMAGES AND MASK RCNN, {IMECE2024-149723}

Aditi Barua - *University of Arkansas at Little Rock*
Shweta Dabetwar - *University of Arkansas at Little Rock*

R58. RAPID SCREENING OF NEW DNA FLUOROGENIC APTAMERS WITH THE SELEX-NGS PLATFORM, {IMECE2024-149735}

Kyle Le - *University of Texas at Austin*
Yujie He - *Univeristy of Texas at Austin*
Zhenglin Yang - *University of Texas at Austin*
Yu-An Kuo - *University of Texas at Austin*
Yuting Wu - *University of Texas at Austin*
Yi Lu - *University of Texas at Austin*
Tim Yeh - *University of Texas at Austin*

R59. CHARACTERIZATION OF WAKE FLOW DYNAMICS AND ENERGY TRANSPORT IN VORTEX-INDUCED VIBRATION SYSTEMS: A LOW REYNOLDS NUMBER INVESTIGATION, {IMECE2024-149745}

Jooi Albano - *The City College of New York*
Ilya Avros - *Macaulay Honors College at The City College of New York*
Andrei Fershalov - *City College of New York*
Pieter Orlandini - *City College of New York*
Niell Elvin - *City College of New York*
Yang Liu - *The City College of New York*

R60. QUANTIFYING THE MECHANICS OF NANOFIBRILLATED CELLULOSE GELS, {IMECE2024-149838}

Samir Patel - *University of Wisconsin-Madison*
Jacob Notbohm - *University of Wisconsin-Madison*

R61.INVESTIGATION OF FIBER OPTIC SENSING OF STRAIN AND TEMPERATURE FIELDS IN HYPERSONIC STRUCTURES, {IMECE2024-149841}

Rafael Meza - *University of Maryland, College Park*
Miao Yu - *University of Maryland, College Park*
Balakumar Balachandran - *University of Maryland, College Park*

R62. LAST-MILE DELIVERY OPTIMIZATION: A CASE-STUDY USING MEITUAN DATASET, {IMECE2024-149808}

Hang Zhou - *Leonardo Da Vinci Engineering School (ESILV)*
Zhe Yuan - *Léonard de Vinci Pôle Universitaire, Research Center*
Swaminath Venkateswaran - *Léonard de Vinci Pôle Universitaire, Research Center*

R63. IN-SITU SMELTING OF DISCARDED URBAN SCRAP INTO ALUMINUM ALLOYS, {IMECE2024-149797}

Chuhao Li - *Worcester Polytechnic Institute*
Hyunsoo Jin - *Worcester Polytechnic Institute*
Brajendra Mishra - *Worcester Polytechnic Institute*
Jianyu Liang - *Worcester Polytechnic Institute*

R64. CURRICULUM INTEGRATION THROUGH COLLABORATIVE TEACHING, {IMECE2024-149788}

Diana-Andra Borca-Tasciuc - *Rensselaer Polytechnic Institute*
Sarah Felix - *Rensselaer Polytechnic Institute*
Karthik Panneerselvam - *Rensselaer Polytechnic Institute*
Fotios Kopsaftopoulos - *Rensselaer Polytechnic Institute*
Amy Svirsky - *Rensselaer Polytechnic Institute*
Antoinette Maniatty - *Rensselaer Polytechnic Institute*
Catalin Picu - *Rensselaer Polytechnic Institute*
Wei Ji - *Rensselaer Polytechnic Institute*

R65. UNCOVERING ELECTRO-MECHANO-PHYSIOLOGICAL RULES OF LIFE: A NEW 2D/3D ALL-OPTICAL INTERROGATION TECHNOLOGY, {IMECE2024-149376}

Chenyu Liang - *University of Florida*
Miao Huang - *University of Florida*
Erica Hengartner - *University of Florida*
Abygale Cochrane - *University of Florida*
Laura Garzon - *University of Florida*
Allison Campbell - *University of Florida*
He Tian - *BioNTech SE*
Urs Böhm - *Institute of Psychiatry and Neuroscience of Paris*
Christopher Werley - *Vertex Pharmaceuticals*
Habibeh Khoshbouei - *Univesity of Florida*
Min Lin - *Univesity of Florida*
Christopher Mccurdy - *University of Florida*
Yuqing Li - *University of Florida*
Lance Mcmahon - *Texas Tech University Health Sciences Center*
Bruna Balbino De Paula - *University of Florida*
Basak Ayaz - *University of Florida*
Robert Caudle - *University of Florida*
Christine Schmidt - *University of Florida*
Dietmar Siemann - *University of Florida*
Xin Tang - *University of Florida*

R66. LEVERAGING LARGE LANGUAGE MODELS AND KNOWLEDGE GRAPHS FOR ENHANCED TECHNICAL DOCUMENT CLASSIFICATION, {IMECE2024-149312}

Alessandro Stefanone - *Politecnico di Milano*

R67. DESIGN AND FABRICATION OF SILICONE-BASED BIOSCAFFOLDS USING ADDITIVE MANUFACTURING, {IMECE2024-147221}

Shu-Yi Chang - *National Taiwan University*
Dian-Ru Li - *National Taiwan University*

R68. RETROGRADE FLOW IN MOUSE ARTERIOVENOUS FISTULA, {IMECE2024-149318}

Hannah Northrup - *University of Utah*
Timmy Lee - *University of Alabama at Birmingham*
Yan-Ting Shiu - *University of Utah*

R69. TOWARDS THE NEXT GENERATION PORTABLE OPTICAL DEVICE FOR SINGLE MOLECULE ANALYSIS, {IMECE2024-149557}

Jeong Tae Ok - *Shawnee State University*
Hee Eun Kim - *National NanoFab Center*
Jung Ho Yoo - *National NanoFab Center*
Seong Soo Choi - *NanoPore Korea*

R70. PERFORMANCE EVALUATION AND MODELING OF HYBRID COMPOSITE LAMINATES UNDER LOW-VELOCITY IMPACT LOADING: ENHANCING IMPACT RESISTANCE, {IMECE2024-149499}

Joshua Tucker - *North Carolina A&T State University*
Ajit Kelkar - *North Carolina A&T State University*

R71. IDENTIFYING THE IMPACT OF METROLOGICAL PARAMETERS FOR ENERGY DEMAND PREDICTION IN THE USA USING A HYBRID SVM-PSO OPTIMIZATION TECHNIQUE, {IMECE2024-149640}

Rahul Makade - *Stevens Institute of Technology*
Gizem Acar - *Stevens Institute of Technology*

R72. IDENTIFICATION OF DAMAGE STATE IN CARBON FIBER REINFORCED COMPOSITES USING TRANSFER LEARNING, {IMECE2024-149641}

Hannah Jones - *University of Arkansas at Little Rock*
Shweta Dabetwar - *University of Arkansas at Little Rock*

R73. DIRECT INK WRITE 3D PRINTING OF FULLY DENSE AND FUNCTIONALLY GRADED LIQUID METAL ELASTOMER FOAMS, {IMECE2024-149586}

Spencer Pak - *University of Nebraska-Lincoln*
Michael Bartlett - *Virgnia Tech*
Eric Markvicka - *University of Nebraska-Lincoln*

R74. EXPLORING METAL ADDITIVE MANUFACTURING IN MARTIAN ATMOSPHERIC ENVIRONMENTS, {IMECE2024-149613}

Zane Mebruer - *University of Arkansas*
Wan Shou - *University of Arkansas*

R75. ADVANCED HEALTH MONITORING OF COMPOSITE STRUCTURES USING DENSE SPRAY-COATING ACTIVE SENSING ARRAYS, {IMECE2024-149706}

Shulong Zhou - *Shanghai Jiao Tong University*
Yanfeng Shen - *Shanghai Jiao Tong University*

R76. ULTRASONIC GUIDED WAVE-BASED DAMAGE DETECTION AND IMAGING FOR COMPOSITE STORAGE TANKS, {IMECE2024-149707}

Houfu Jiang - *Shanghai Jiao Tong University*
Yanfeng Shen - *Shanghai Jiao Tong University*
Yegao Qu - *Shanghai Jiao Tong University*

R77. MECHANICS OF ARCHITECTED MATERIALS ACROSS LENGTH AND TIME SCALES, {IMECE2024-148643}

Carlos Portela - *MIT*

R78. ANALYTICAL STUDY ON THE THERMAL PERFORMANCE CHARACTERISTICS OF FUEL CELL COOLING SYSTEMS COMBINED WITH HEAT PUMP TECHNOLOGY, {IMECE2024-146053}

Sang-Min Chung - *Inha University*
Dong Gyu Park - *Inha University*
Chul-Hee Lee - *Inha University*
Seung Bae Lee - *Inha University*
Hyun Taek Lee - *Inha University*

R79. STRUCTURAL DESIGN OF HELICAL TUBE STEAM GENERATOR FOR SMR, {IMECE2024-149252}

Kwanghyun Ahn - *Korea Atomic Energy Research Institute*
Gyogeun Youn - *Korea Atomic Energy Research Institute*
Gyu Mahn Lee - *Korea Atomic Energy Research Institute*

R80. ENHANCING AERODYNAMICS OF F1® IN SCHOOLS RACE CAR USING VENTURI EFFECT, {IMECE2024-149260}

Feras Al Shehri - *Ministry of Ednucation, Aseer region*
Leen Al Gaees - *Ministery of Education, Aseer region*
Yazan Al Gubaisi - *King Khalid University*
Sagr Al Amri - *King Khalid Univeresty*
Ali Rajhi - *King Khalid University*

R81. PERFORMANCE ENHANCEMENT OF THERMOELECTRIC GENERATORS INTEGRATED WITH ADVANCED METAMATERIALS DESIGN FOR WASTE HEAT RECOVERY, {IMECE2024-149159}

Ya Tang - *Dartmouth College*
Bowen Huang - *Dartmouth College*
Yan Li - *Dartmouth College*

R80. EFFECTS OF THE CUTTING PROCESS PARAMETERS ON THE QUALITY OF 5H BIAXIAL WOVEN CARBON-FIBER DRY FABRIC PATTERNS, {IMECE2024-148696}

Chris Miskell - *Washington State University Vancouver*
Dr. Dave Kim - *Washington State University Vancouver*

R81. EXPERIMENTAL CHARACTERIZATION OF HIGH-SURFACE AREA THERMAL ENERGY STORAGE, {IMECE2024-148867}

Casey Troxler - *Embry-Riddle Aeronautical University*
Thomas Freeman - *National Renewable Energy Laboratory (NREL)*
Karl Morgan - *Embry-Riddle Aeronautical University*
Adewale Odukomaiya - *National Renewable Energy Laboratory (NREL)*
Sandra Boetcher - *Embry-Riddle Aeronautical University*

R82. MULTI-SCALE MODELING OF PARTICLE SIZE DISTRIBUTION IN METAL ADDITIVE MANUFACTURING - EFFECT ON STRUCTURE AND POROSITY, {IMECE2024-148931}

Nikhil Ingle - *North Carolina Agricultural and Technical State University*
Rauf Shah - *North Carolina Agricultural and Technical State University*
Ram Mohan - *North Carolina Agricultural and Technical State University*

R83. CO-PRODUCTION OF HIGH-QUALITY HYDROGEN AND CARBON MONOXIDE VIA CHEMICAL LOOPING DRY REFORMING OF METHANE, {IMECE2024-148147}

Cheng-Wei Hong - *National Chung Hsing University*
Rei-Yu Chein - *National Chung Hsing University*

R84. HEAT GAIN THROUGH WINDOW WITH A SHUTTER USED IN BUILDINGS, {IMECE2024-147847}

Esam Alawadhi - *Kuwait University*

R85. NEURAL NETWORK ASSISTED BROADBAND PERFECT ABSORBING META-LAYER DESIGN FOR WAVE AND VIBRATION ATTENUATION, {IMECE2024-148011}

Xiaopeng Li - *Toyota Research Institute of North America*

R86. IMPACT OF INFILL DENSITY AND RASTER ANGLE ON 3D PRINTED PETG MECHANICAL PROPERTIES, {IMECE2024-150146}

Mechack Nduwa - *Kennesaw State University*
Aaron Adams - *Kennesaw State University*
Edgar Bryant - *Kennesaw State University*
David Stollberg - *Kennesaw State University*
Cameron Coates - *Kennesaw State University*

R87. THERMAL CONDUCTIVITY OF PEROVSKITE AND POST PEROVSKITE MGSIO3 USING MACHINE LEARNING INTERATOMIC POTENTIAL, {IMECE2024-145660}

Janak Tiwari - *University of Utah*
Tianli Feng - *University of Utah*

R88. THE MOVING FRAME PARADIGM IN RIGID BODY DYNAMICS EDUCATION, {IMECE2024-150135}

Thomas Impelluso - *Western Norway University of Applied Sciences*
Thorstein Rykkje - *Western Norway University of Applied Sciences*

R89. USING TOPOLOGICAL INTERLOCKED TESSELLATIONS TO ENABLE COOPERATIVE 3D PRINTING, {IMECE2024-150142}

Matthew Ebert - *Texas A&M University*
Ronnie Stone - *University of Texas*
John Koithan - *Texas A&M University*
Ergun Akleman - *Texas A&M University*
Yuri Estrin - *Monash University*
Zhenghui Sha - *University of Texas*
Matt Pharr - *Texas A&M University*
Vinayak Krishnamurthy - *Texas A&M University*

R90. PLASMA ENHANCED SEED GERMINATION FOR APPLICATION IN SPACE AGRICULTURE, {IMECE2024-150213}

Srida Aliminati - *San Jose State University*

R91. CHARACTERIZING PLASMA-ACTIVATED WATER REQUIRED FOR EFFECTIVE WOUND HEALING PROCESS, {IMECE2024-150215}

Sonya Sar - *San Jose State University*
Sharon Mathew - *San Jose State University*
Sohail Zaidi - *San Jose State University*

R92. WATER DROPLET EVAPORATION IN AIR: EFFECTS OF INTERFACIAL THERMAL AND MASS DIFFUSION RESISTANCE, {IMECE2024-150242}

Wazih Tausif - *Missouri University of Science and Technology*
Zhi Liang - *Missouri University of Science and Technology*

R93. SOLAR-THERMAL PHOTOCATALYTIC CYLINDRICAL GRAPHITE FOR THERMAL INTERFACE MATERIALS, {IMECE2024-150245}

Min Jong Kil - *University of California, Los Angeles*
Timothy Fisher - *University of California, Los Angeles*

R94. UNDERSTANDING THE JOINING MECHANISMS OF GRCOP42 - INCONEL 625 FABRICATED VIA LASER DIRECTED ENERGY DEPOSITION, {IMECE2024-150293}

Nahal Ghanadi - *Oregon state University*
Somayeh Pasebani - *Oregon state University*

R95. A NOVEL DESIGN OF A HEATING AND THERMAL STORAGE SYSTEM USING A PARABOLIC MIRROR SOLAR COLLECTOR FOR THE SUSTAINABILITY OF HUMAN EXPLORATION ON THE LUNAR SURFACE, {IMECE2024-150010}

Valesia Davis - *North Carolina Agricultural and Technical State University*
John P. Kizito - *North Carolina Agricultural and Technical State University*

R96. ALL-IN-ONE COMPOSITE INTEGRATING OPTICAL AND THERMAL REGULATION FOR ALL-SEASON BUILDING THERMAL COMFORT, {IMECE2024-149928}

Lyu Zhou - *The University of Texas at Dallas*
Leshi Feng - *The University of Texas at Dallas*
Shuang Cui - *The University of Texas at Dallas*

R97. ON THE DYNAMIC BEHAVIOR OF MECHANICAL METAMATERIAL WITH TUNABLE FRICTIONAL ENERGY DISSIPATION: NUMERICAL AND EXPERIMENTAL STUDY, {IMECE2024-149931}

Fatemeh Delzendehrooy - *Iowa State University*
Carson Willey - *Air Force Research Laboratory*
Vincent Chen - *Air Force Research Laboratory*
Abigail T. Juhl - *Air Force Research Laboratory*
Azadeh Sheidaei - Iowa State University

R98. FROM BUCKYBALL C60 TO AMORPHOUS CARBON STRUCTURE THROUGH ATOMISTIC MODELING, {IMECE2024-145615}

Ruideng Zhong - *Clemson University*
Jingzhe Qiao - *Clemson University*
Hai Xiao - *Clemson University*
Huijuan Zhao - *Clemson University*

R99. INTEGRATED FEM AND STATISTICAL LEARNING APPROACH FOR CHARACTERIZING THE EFFECT OF PROCESS PARAMETERS ON MATERIAL DESIGN, {IMECE2024-149966}

Jason Hasse - *South Dakota State University*
Semhar Michael - *South Dakota State University*
Anamika Prasad - *Florida International University*

R100. INVESTIGATION OF ENERGY EXCHANGE BETWEEN COUPLED MECHANICAL-ELECTRICAL CONSERVATIVE OSCILLATORS, {IMECE2024-149970}

Kairvi Lodhiya - *Rensselaer Polytechnic Institute*
Zahra Sotoudeh - *California State Polytechnic University*
Diana-Andra Borca-Tasciuc - *Rensselaer Polytechnic Institute*

R101. PLASMA-WOUND INTERACTION: PLASMA CHARACTERIZATION TO VALIDATE RADICALS AND IDENTIFY PLASMA TEMPERATURE VARIATIONS, {IMECE2024-150095}

Aryan Tummala - *BASIS Independent Silicon Valley*
Sohail Zaidi - *San Jose State University*

R102. UTILIZATION OF ULTRASOUND FOR DEFECT DETECTION OF ADDITIVE FRICTION-STIR DEPOSITION REPAIRS, {IMECE2024-150122}

Ryan Hatmaker - *Baylor University*
Adam Swinney - *Baylor University*
David Jack - *Baylor University*
Trevor Fleck - *Baylor University*

R103.ESTIMATION OF GROUND REACTION FORCES USING KINEMATIC DATA AND OPENSIM., {IMECE2024-150061}

Ranjan Das - *University of California Merced*
Jacques-Ezechiel N'guessan - *University of California, Merced*
Sachin Goyal - *University of California, Merced*
Matthew Leineweber - *Biomotum Inc.*

R104. ENHANCING ENGINEERING DYNAMICS EDUCATION THROUGH DYNAMIC SIMULATIONS: A CASE STUDY USING WORKING MODEL 2-D, {IMECE2024-150000}

Masoud Olia - *Wentworth Institute of Technology*

R105. A 3D PHASE-FIELD APPROACH TO SIMULATE BRITTLE FRACTURE OF SINGLE CRYSTAL SILICON, {IMECE2024-150028}

Yanhui Jiang - *School of Mechanical Engineering, Nanjing University of Science and Technology*
Hamid Nayeb-Hashemi - *Northeastern University*
Masoud Olia - *Wentworth Institute of Technology*

R106. SENSITIVITY OF HIGHER-ORDER INTERATOMIC FORCE CONSTANTS AND THERMAL CONDUCTIVITY TO THE ENERGY SURFACE ROUGHNESS OF EXCHANGE-CORRELATION FUNCTIONALS, {IMECE2024-150521}

Hao Zhou - *University of Utah*
Shuxiang Zhou - *Idaho National Laboratory*
Zilong Hua - *Idaho National Laboratory*
Kaustubh Bawane - *Idaho National Laboratory*
Tianli Feng - *University of Utah*

R107. QUANTIFYING HOW ADDITIONAL MASS ADDED TO VIBRATION FATIGUE TESTING ASSEMBLY IMPACTS STRAIN RESPONSE., {IMECE2024-150509}

Jacob Heninger - *Utah State University*
Jeffrey Wagner - *Utah State University*
Tate Adams - *Utah State Universtiy*
Brandon Furman - *Utah State University*
Ryan Berke - *Utah State University*

R108. MODELING OF MICROPLASTIC REMOVAL FROM MUNICIPAL WASTEWATER WITH CERAMIC MEMBRANES, {IMECE2024-150513}

Elisha Sam Acquah - *Tarleton State University*
Hongbo Du - *Tarleton State University*

R109. C60 EMBEDDED SIOC ELECTROSPUN FIBERMAT AS A HIGH-CAPACITY ELECTRODE MATERIAL IN LI-ION BATTERIES., {IMECE2024-145074}

Arijit Roy - *Kansas State University*
Shakir Bin Mujib - *Kansas State University*
Gurpreet Singh - *Kansas State University*

R110. MOLECULAR DYNAMICS (MD) SIMULATION OF SILICON NANOPARTICLE CRYSTALLIZATION DURING LASER-INDUCED (LIFT) PRINTING, {IMECE2024-150473}

Youwen Liang - *University of Arkansas*
Wan Shou - *University of Arkansas*

R111. AUTOMATED DE NOVO DESIGN OF ARCHITECTURED MATERIALS BASED ON EXPLANABLE ARTIFICIAL INTELLEGENCE, {IMECE2024-150465}

Zhengkun Feng - *University of Connecticut*
Weijun Lei - *State University of New York at Stony Brook*
Leidong Xu - *University of Connecticut*
Shikui Chen - *State University of New York at Stony Brook*
Hongyi Xu - *University of Connecticut*

R112. A THERMAL SYSTEM TO ASSESS IMPACT OF EXTREME HEAT ON POTATO CANOPIES, {IMECE2024-150546}

Max Saviello - *Washington State University*
Tyler Akana - *Washington State University*
Mark Pavek - *Washington State University*
Jacob Blauer - *Washington State University*
Soumik Banerjee - *Washington State University*

R113. ON-DEMAND RAPID FABRICATION OF COMPONENTS USING FORWARD OPERATING BASE ALUMINUM WASTE, {IMECE2024-150553}

Danyang Zheng - *Worcester Polytechnic Institute*
Yutao Wang - *Worcester Polytechnic Institute*
Brajendra Mishra - *Worcester Polytechnic Institute*
Jianyu Liang - *Worcester Polytechnic Institute*

R114. THE NEED FOR RAPID AND ACCURATE PERFORMANCE METRICS FOR VERTICAL BUILDING INTEGRATED PHOTOVOLTAICS, {IMECE2024-150532}

Sara Rizvi - *Rensselaer Polytechnic Institute*
Hannah Arnow - *Rensselaer Polytechnic Institute*
Diana Borca Tasciuc - *Rensselaer Polytechnic Institute*

R115. EFFICIENT HYDROGEN PRODUCTION THROUGH HIGH VOLATILE FATTY ACIDS YIELD, {IMECE2024-150533}

Wriley Ainsworth - *Tarleton State University*
Hoe-Gil Lee - *Tarleton State University*

R116. MACHINE LEARNING APPROACHES TO PREDICT SURFACE ROUGHNESS IN INCONEL SAMPLES PRINTED VIA POWDER BED FUSION PROCESS, {IMECE2024-150563}

Santosh Rauniyar - *University of Houston*
Ben Xu - *University of Houston*
Mathew Farias - *University of Houston*

R117. COMPARATIVE EXPERIMENTAL AND THEORETICAL STUDY OF TEMPERATURE RISE FOR FREESTANDING AND MASONRY EMBEDDED SOLAR CELLS, {IMECE2024-150579}

Ozioma Ozioko - *Rensselaer Polytechnic Institute*
Patrick Quinlan - *Solablock Inc.*
Jason Laverty - *Solablock Inc.*
John O'connor - *Solablock Inc.*
Diana-Andra Borca-Tasciuc - *Rensselaer Polytechnic Institute*

R118. STRUCTURES FOR CONTROLLING LIQUID-VAPOR COUNTERFLOW IN POOL BOILING, {IMECE2024-150318}

Roman Giglio - *University of California Merced*
James Palko - *University of California Merced*

R119. A MESHFREE PHASE-FIELD MODEL FOR SIMULATING THE SINTERING PROCESS OF METALLIC PARTICLES FOR PRINTED ELECTRONICS, {IMECE2024-150341}

Changyong Cao - *Case Western Reserve University*
Md Shariful Islam - *Case Western Reserve University*

R120. CONTACTLESS AND REVERSIBLE ELECTROWETTING BY CONTROLLED CHARGE DEPOSITION, {IMECE2024-145099}

Yifan Zhou - *Wuhan University*
Huai Zheng - *Wuhan University*
Sang W. Joo - *Yeungnam University*

R121. DISSECTING GAIT DEVIATIONS IN ABOVE-KNEE AMPUTEES: A COMPUTATIONAL FRAMEWORK FOR PROSTHETIC DESIGN OPTIMIZATION, {IMECE2024-150343}

Sachin Goyal - *University of California Merced*
Muhammad Ahmed - *University of California Merced*
Matthew Leineweber - *Biomotum Inc.*
Jacques Nguessan - *University of California Merced*

R122. SPRAY ATOMIZATION CHARACTERIZATION WITH THE AID OF MACHINE LEARNING, {IMECE2024-150375}

Srinivasa Pavan Kancharla - *University of Washington*
Yushu Lin - *University of Washington*
John Palmore Jr - *University of Washington*

R123. A CYBER-SECURITY CASE STUDY: BALANCING OPENNESS AND PROTECTION FOR A MANUFACTURING RESEARCH ENVIRONMENT, {IMECE2024-150368}

David Sanderson - *University of Nottingham*
Jack Chaplin - *University of Nottingham*
Svetan Ratchev - *University of Nottingham*

R124. DATA DRIVEN SUSTAINABILITY IN POWDER BED FUSION WITH BIG DATA ANALYSIS OF ENVIRONMENTAL IMPACTS INDICATORS, {IMECE2024-150364}

Shunyang Ning - *Aalto University*

R125. DEVELOPMENT AND OPTIMIZATION OF HYBRID HEAT DISSIPATION SYSTEM FOR LITHIUM-ION BATTERY PACKS, {IMECE2024-150392}

Xuguang Zhang - *Northeastern University*
Yang Liu - *Northeastern University*
Michael Halbig - *NASA Glenn Research Center*
Mrityunjay Singh - *Ohio Aerospace Institute*
Amjad Almansour - *NASA Glenn Research Center*
Yi Zheng - *Northeastern University*

R126. HEAT TRANSFER ENHANCEMENT IN SOLAR AIR HEATERS USING VORTEX GENERATORS AS PASSIVE FLOW CONTROLS, {IMECE2024-150428}

Mohannad Khair - *The Pennsylvania State University*
Tamy Guimaraes - *The Pennsylvania State University*

R127. DESIGN, FABRICATION AND CHARACTERIZATION OF SELF-SWITCHABLE THERMOCHROMIC COATING FOR ALL-DAY THERMOPHOTONIC POWER GENERATION, {IMECE2024-150404}

Ken Araki - *Arizona State University*
Liping Wang - *Arizona State University*

R128. INFLUENCE OF SKEW ANGLE ON ULTRASONIC GUIDED-WAVE BEAM SOLUTIONS IN ANISOTROPIC COMPOSITE PLATES, {IMECE2024-150434}

Sumika Yamada - *Tokyo Institute of Technology*
Taizo Maruyama - *Tokyo Institute of Technology*
Akira Furukawa - *Hokkaido University*

R129. DIGITAL TWIN ENABLED LAYOUT OPTIMIZATION FRAMEWORK FOR PHOTOGRAMMETRY CAMERAS IN RECONFIGURABLE ROBOTIC WORK CELLS, {IMECE2024-150459}

Stevan Pandurevic - *University of Nottingham*
Zi Wang - *University of Nottingham*
David Sanderson - *University of Nottingham*
Svetan Ratchev - *University of Nottingham*

R130. A MACHINE LEARNING APPROACH TO SENSITIVITY ANALYSIS: MAIZE STALK FLEXURE AND STRENGTH, {IMECE2024-150878}

Joseph Carter - *Brigham Young University*
Ryan Hall - *Brigham Young University*
Douglas Cook - *Brigham Young University*

Committee Meetings

IMECE 2024 COMMITTEE MEETINGS & SPECIAL EVENTS @ HYATT REGENCY PORTLAND

DAY	DATE	NAME	START	END	ROOM
Saturday	11/16/2024	Registration	7:00AM	5:00PM	Deschutes Foyer, Level 1
Saturday	11/16/2024	Technical committee on Publications & Communications (TCPC)	7:30AM	12:00PM	Columbia 1, Level 3
Saturday	11/16/2024	Joint Editors-in-Chief (EiC)/ Technical Committee on Publications & Communications (TCPC)	12:00PM	5:00PM	Columbia 1, Level 3
Sunday	11/17/2024	Registration	7:00AM	5:00PM	Deschutes Foyer, Level 1
Sunday	11/17/2024	ASME Board of Governors Meeting- CLOSED	8:00AM	1:00PM	Willamette 1, Level 2
Sunday	11/17/2024	Journal Editor-in-Chief Workshop	10:00AM	12:00PM	Willamette 5, Level 2
Sunday	11/17/2024	Heat Transfer Division Executive Committee Closed Meeting	12:00PM	2:00PM	Willamette 4, Level 2
Sunday	11/17/2024	Elevate ME (Pre registration required)	12:30PM	2:30PM	Deschutes Ballroom A-B, Level 1
Sunday	11/17/2024	Heat Transfer Division Executive Commitee Open Meeting	2:00PM	4:00PM	Willamette 1, Level 2
Monday	11/18/2024	Fracture and Fatigue Mechanics Technical Committee	3:00PM	4:00PM	Columbia 1, Level 3
Monday	11/18/2024	Highlights of the 22nd Symposium on Thermophysical Properties	3:45PM	5:30PM	Columbia 3, Level 3
Monday	11/18/2024	CONCAM Committee Meeting	4:00PM	5:00PM	Columbia 2, Level 3
Monday	11/18/2024	Electronic Materials TC Meeting	5:00PM	6:00PM	Columbia 1, Level 3
Monday	11/18/2024	Materials Process TC meeting	6:00PM	7:00PM	Willamette 1, Level 2
Monday	11/18/2024	ASME Nanoengineering Technology Group Annual Committee Meeting	7:00PM	8:00PM	Willamette 1, Level 2
Monday	11/18/2024	K-20 Computational Heat Transfer Committee Meeting	7:00PM	8:30PM	Columbia 2, Level 3
Monday	11/18/2024	K-13 Heat Transfer in Multi-Phase Flow	7:00PM	8:30PM	Columbia 3, Level 3
Monday	11/18/2024	K6 Heat Transfer in Energy Systems Committee Meeting	7:00PM	8:30PM	Columbia 4, Level 3
Monday	11/18/2024	K 7 Thermophysical Properties Committee Meeting	8:00 PM	9:00 PM	Willamette 1, Level 2
Tuesday	11/19/2024	Applied Mechanics Executive Committee Meeting and Strategy Session	9:30AM	12:00PM	Willamette 1A, Level 2
Tuesday	11/19/2024	Fluids Engineering Division Town Hall	9:30AM	10:30AM	Willamette 6, Level 2
Tuesday	11/19/2024	Applied Mechanics Division - Awards Committee Meeting	12:00PM	4:45PM	Willamette 1A, Level 2

IMECE 2024 COMMITTEE MEETINGS & SPECIAL EVENTS @ HYATT REGENCY PORTLAND

DAY	DATE	NAME	START	END	ROOM
Tuesday	11/19/2024	Technical Committee on Instabilities in Solids and Structures	12:00PM	1:00PM	Willamette 1B, Level 2
Tuesday	11/19/2024	Technical Committee Meeting for Mechanics of Soft Materials	1:00PM	2:00PM	Willamette 1B, Level 2
Tuesday	11/19/2024	MD Design of Engineering Materials Technical Committee Meeting	2:00PM	3:00PM	Columbia 3, Level 3
Tuesday	11/19/2024	Entrepreneurship from Nano to Industry	3:00PM	4:45PM	Convention Center, D138
Tuesday	11/19/2024	TEC Sector/2025 IMECE Organizing Committee Meeting	4:00PM	5:30 PM	Columbia 1, Level 3
Tuesday	11/19/2024	Materials for Biomimetic and Medical Applications Technical Committee Meeting	4:00PM	5:00PM	Willamette 1B, Level 2
Tuesday	11/19/2024	Advanced Energy Systems Division Lecture & Reception (Frank Kreith Energy Award & Edward F. Obert Award)	5:00PM	7:00PM	Deschutes Ballroom A, Level 1
Tuesday	11/19/2024	Fluid Measurements and Instrumentation Technical Committee	5:00PM	6:00PM	Columbia 3, Level 3
Tuesday	11/19/2024	"Composites and Heterogenous Materials Technical Committee Meeting (Materials Division)"	5:00PM	6:30PM	Willamette 1B, Level 2
Tuesday	11/19/2024	Koiter Lecture	5:00PM	6:00PM	Willamette 6, Level 2
Tuesday	11/19/2024	Advancement in Industry Networking Reception	5:45PM	7:15PM	Multnomah Room, Level 1
Tuesday	11/19/2024	Renewable Energy and Energy Conversion Technical Committee Meeting	6:00PM	7:30PM	Columbia 3, Level 3
Tuesday	11/19/2024	Biomedical and Biotechnology Track Organisers	6:00PM	7:00PM	Columbia 1, Level 3
Tuesday	11/19/2024	Computational Fluid Dynamics Technical Committee	6:00PM	7:00PM	Columbia 2, Level 3
Tuesday	11/19/2024	ME Department Heads Reception	6:00PM	8:00PM	Regency Club, Level 3
Tuesday	11/19/2024	Applied Mechanics Awards Dinner (Timoshenko Medal)	6:30PM	8:00PM	Deschutes Ballroom BC, Level 1
Tuesday	11/19/2024	Fluid Applications & Systems Technical Committee	7:00PM	8:00PM	Columbia 1, Level 3
Tuesday	11/19/2024	K-8 Theory and Fundamental Research Committee Meeting	7:00PM	8:30PM	Columbia 4, Level 3
Tuesday	11/19/2024	K-9 Nanoscale Thermal Transport Committee Meeting	7:00PM	9:00PM	Columbia 2, Level 3
Tuesday	11/19/2024	K11-Fire and Combustion Committee Meeting	7:00PM	8:30 PM	Willamette 1B, Level 2

IMECE 2024 COMMITTEE MEETINGS & SPECIAL EVENTS @ HYATT REGENCY PORTLAND

DAY	DATE	NAME	START	END	ROOM
Tuesday	11/19/2024	K15 Transport Phenomena in Manufacturing and Materials Committee Meeting	7:00PM	8:30 PM	Willamette 1A, Level 2
Tuesday	11/19/2024	K12 Aerospace Committee Meeting	7:00PM	8:30 PM	Willamette 4, Level 2
Tuesday	11/19/2024	Advanced Energy Systems Division Renewable Energy & Energy Conversion Technical Committee Meeting	7:00PM	8:00 PM	Columbia 5, Level 3
Tuesday	11/19/2024	" Advanced Energy Systems Electrochemical Energy Conversion and Storage Technical Committee Meeting "	7:00PM	8:00 PM	Willamette 5, Level 2
Tuesday	11/19/2024	Advanced Energy Systems Analysis Technical Committee Meeting	7:00PM	8:00 PM	Willamette 8, Level 2
Tuesday	11/19/2024	Advanced Energy Systems Division Executive Committee Meeting	8:00PM	9:00 PM	Columbia 3, Level 3
Tuesday	11/19/2024	Fluid Mechanics Technical Committee	8:00PM	9:00 PM	Columbia 1, Level 3
Tuesday	11/19/2024	Multifunctional Materials TC meeting	8:00PM	9:00 PM	Columbia 5, Level 3
Wednesday	11/20/2024	Noise Control and Acoustics Division: Rayleigh Lecture	11:10AM	12:10PM	Convention Center, Room B114
Wednesday	11/20/2024	Orr Early Career Award Lecture	2:10PM	2:40PM	Convention Center, Room D138
Wednesday	11/20/2024	Sia Nemat-Nasser Early Career Award Lecture	2:40PM	3:40PM	Convention Center, Room D138
Wednesday	11/20/2024	AMD/MD Constitutive Equations Technical Committee Meeting	4:00PM	5:00PM	Columbia 4, Level 3
Wednesday	11/20/2024	Micro and Nano Fluid Dynamics Technical Committee	4:00PM	5:00PM	Columbia 3, Level 3
Wednesday	11/20/2024	Centennial Mid-Career Award Lecture	4:05PM	4:40PM	Convention Center, Room D138
Wednesday	11/20/2024	Nadai Medal	4:40PM	5:25PM	Convention Center, Room D138
Wednesday	11/20/2024	Multiphase Flow Technical Committee	5:00PM	6:00PM	Columbia 3, Level 3
Wednesday	11/20/2024	Women in Engineering Panel & Reception	5:30PM	7:00PM	Deschutes Ballroom BC, Level 1
Wednesday	11/20/2024	ASME MEMS Division	6:00PM	8:00PM	Columbia 2, Level 3
Wednesday	11/20/2024	ASME Journal of Engineering and Science in Medical Diagnostics and Therapy-Editorial Board	6:00PM	7:00PM	Columbia 5, Level 3

IMECE 2024 COMMITTEE MEETINGS & SPECIAL EVENTS @ HYATT REGENCY PORTLAND

DAY	DATE	NAME	START	END	ROOM
Wednesday	11/20/2024	Technical Committee on Dynamics and Control of Systems and Structures	6:00PM	7:00PM	Columbia 3, Level 3
Wednesday	11/20/2024	Fluids Engineering Division Reception	6:30 PM	9:00PM	Multnomah Room, Level 1
Wednesday	11/20/2024	Aerospace Structures and Materials Committees Meeting	7:00PM	8:30PM	Columbia 3, Level 3
Wednesday	11/20/2024	Track 3 (Advanced Manufacturing) Meeting	7:00PM	9:00PM	Deschutes Ballroom A, Level 1
Thursday	11/21/2024	Robert Henry Thurston Lecture Award	9:00AM	9:45AM	Convention Center, Room C123
Thursday	11/21/2024	Materials Division General Meeting	10:30AM	12:00PM	Convention Center, Room D139
Thursday	11/21/2024	Fluids Engineering Division Executive Committee and Technical Chair Meeting (closed)	11:00AM	12.30PM	Convention Center, Room D140
Thursday	11/21/2024	IMECE 2024 Closing Reception	5:45PM	7:00PM	Convention Center, Oregon Ballroom Foyer

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Cornell University College of Engineering	1012
Dassault Systèmes	911
George Fox University	702
George Mason University	808
Italian Trade Agency - Machines Italia	810
JHU WSE - Engineering for Professionals	913
Kyowa Americas Inc	611
MathWorks	803
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NYU Tandon School of Engineering	909
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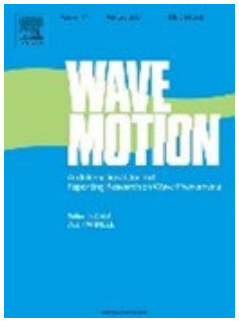
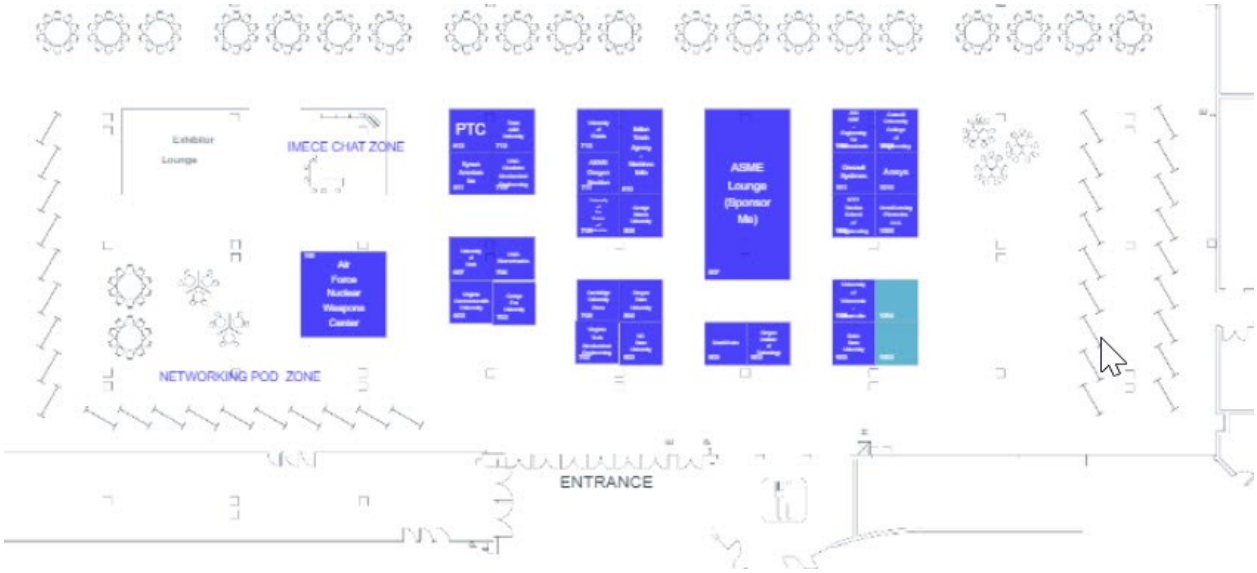


EXHIBITOR FLOORPLAN



To learn more about the exhibitors, visit the intereactive floorplan: https://asme.expocad.com/Events/24imece/index.html.

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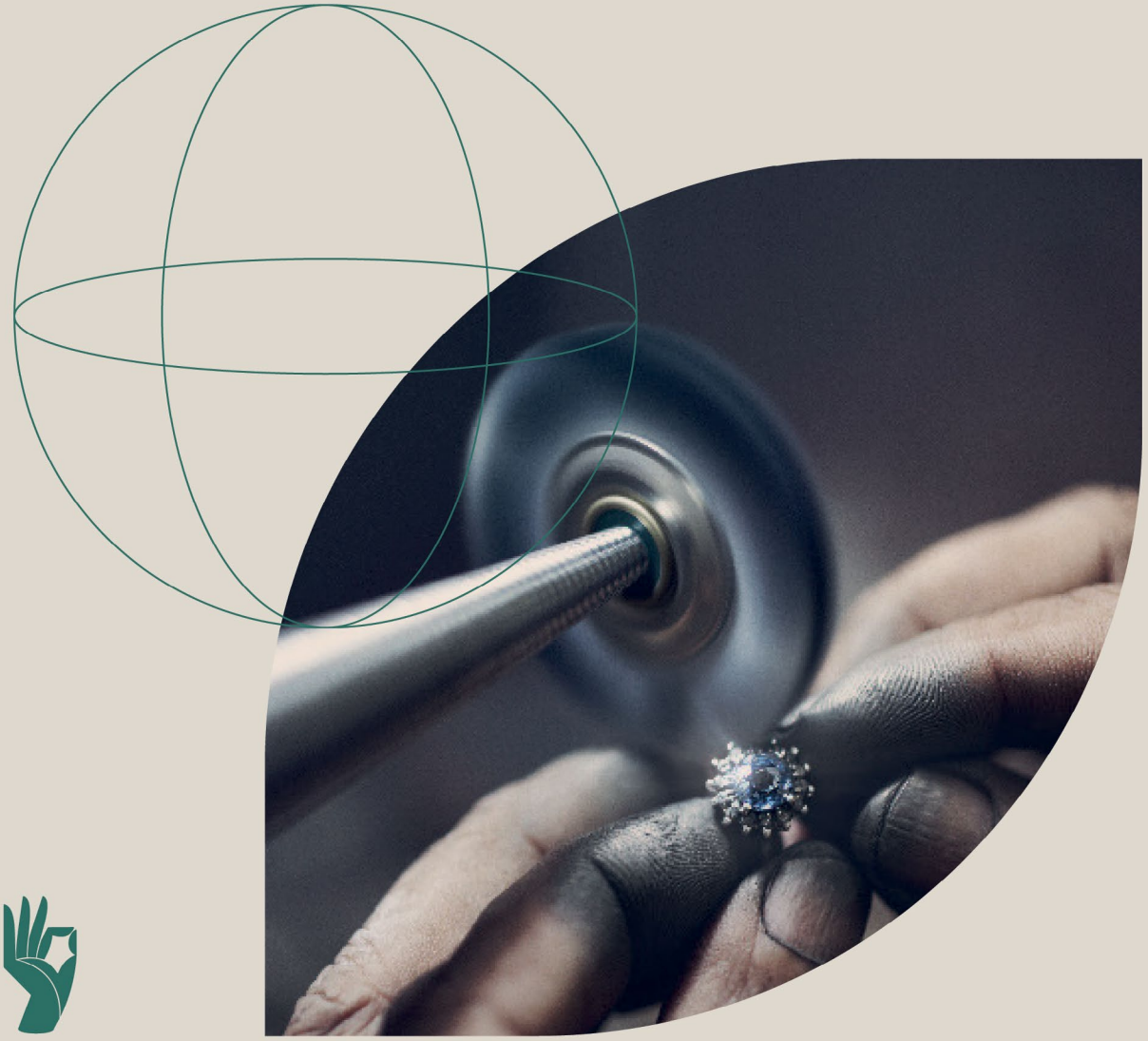

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PANELISTS

Marco Rossoni
Assistant Professor,
Department of Mechanics
Politecnico di Milano

Eng Francesco Pescatori
Senior Cost Engineer at Baker Hughes Firenze

Antonio Zippo
PhD, Professor of Mechanism and Machine Theory and Mechanical Vibration at the "Enzo Ferrari" Department of Engineering, University of Modena and Reggio Emilia

Caterina Rizzi
Full Professor Department of Management, Information and Production Engineering (DIGIP)
Università degli Studi di Bergamo

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