Program

CONFERECE
October 29, 2023 – November 2, 2023

EXHIBITION
October 29, 2023- November 1, 2023

COMMITTEE MEETINGS
October 28, 2023 – November 2, 2023

Ernest N. Morial Convention Center
New Orleans, LA

https://event.asme.org/IMECE
Dear Friends,

As Mayor of the City of New Orleans, I am thrilled to welcome participants to ASME’s International Mechanical Engineering Congress and Exposition (IMECE®). The work you do is truly impactful, and I am excited that you have chosen our great city to promote the art, science, and practice of mechanical engineering.

I applaud your commitment and mission to promote and enhance the technical expertise and professional well-being of the global engineering community through quality programs and activities that better enable its practitioners to contribute to society. Your organization promotes 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. The City of New Orleans supports the development and expansion of this industry that contributes to improved resilient infrastructure, which is aligned with my administration’s priorities. In addition, thank you for allowing us to be part of this experience to engage in transformative innovations.

The energy of our city is unmatched. During your visit, I encourage you to immerse yourself in everything our city has to offer. Treat yourself to our famous cuisines at local restaurants, dance to the beat of our local jazz musicians, and visit our exceptional cultural establishments to indulge in some of New Orleans’ history, such as Congo Square, the National World War II Museum, the New Orleans Museum of Art, or the Ashé Cultural Arts Center. Lastly, I extend my best wishes for an inspirational and educational exposition.

Sincerely,

LaToya Cantrell
Mayor, City of New Orleans
WELCOME FROM THE CHAIRS

ASME 2023 International Mechanical Engineering Congress and Exposition (IMECE), October 29–November 2, 2023, New Orleans, LA, USA

Dear Distinguished Attendees:

Welcome to the ASME 2023 International Mechanical Engineering Congress and Exposition (IMECE) at the New Orleans Ernest N. Morial Convention Center, New Orleans, Louisiana. As we re-establish the new normal of hybrid work, Zoom meetings, and institutional cost-cutting, all of us are very enthusiastic about an in-person and face-to-face IMECE. We are excited about bringing together the International Mechanical Engineering community from academia, industry, and government to share advances in fundamental and applied research as well as innovation in education and technology. The 2023 conference includes 17 Technical Tracks with over 1,500 podium presentations and posters spanning a broad range of mechanical engineering interests relevant around the globe, from scientific research to education, to leadership development, to inspiring the next generation of mechanical engineers and scientists to contribute to our society. The IMECE technical program is a grassroots effort forged by remarkable volunteer contributions and supported by the formidable ASME staff. This conference is also the convergence point for our mechanical engineering community, where together, we celebrate our accomplishments; we recognize our achievements; and we strategically plan for our future.

The IMECE 2023 technical program will begin on Sunday, October 29, with the Opening Reception and Conference Exhibit at 5:30PM. Everybody is cordially invited to participate. Co-located with the reception, we will host the Undergraduate Research and Design Expo that includes Student Design and Poster Competitions and the Undergraduate Float Competition. Keynotes, Plenaries, and Technical sessions are tightly scheduled from Monday morning to Thursday afternoon.

We are delighted to feature impressive Keynote Presentations this year. We start our series with the Kick-Off Keynote (Monday breakfast) by E. Glenn Lightsey, David Lewis Professor of Space Systems Technology at the Georgia Institute of Technology. His talk will be on Small Satellites and the Future of Space Exploration. Our series concludes with the Closing Keynote (Thursday lunch) by Eleanor Morgan, Program Manager & Habitation Architecture Lead for Lockheed Martin Space. Her presentation will be on Architectures for Deep Space Missions. The Track Plenary Series will begin on Monday and continue on Tuesday, Wednesday, and Thursday. Invited and contributed podium presentations will be held in parallel sessions from Monday through Thursday.

The National Science Foundation (NSF) continues to support IMECE by holding the NSF Day on Wednesday to include CBET and CMMI Info Sessions, the One-on-One Session with NSF Program Directors, and the Workshop on Proposal Development. The NSF is funding the CBET/CMMI Student Competition with applications from current CBET/CMMI graduate and undergraduate students. All posters will be showcased during the general Poster Session on Wednesday during lunchtime addressing conference-wide areas of scientific research.

IMECE will also host many events for ASME divisions and committees, including a planned ME Department Heads discussion, Congress-Wide Symposia, and the Applied Mechanics Dinner among others. Special events for 2023 include many of the successful activities from last year, including Roundtables and Panels on Monday, Wednesday, and Thursday. Roundtables will be held on Wednesday during breakfast and will include topics such as Post Graduate Careers in Industry and University; Young Faculty Networking; Building a Research Team; and Hot Topics in Aero Structures, Advanced Manufacturing, Dynamics and Control, Energy, Heat Transfer, and Mechanics of Solids. Panels will be held Monday, Wednesday, and Thursday and will include the NSF Panel on Dynamics, Control, and System Diagnostics; ASCE/ASME Joint Panel on Space Habitats; Exploring the Latest Advances in Acoustics and Vibration Control; Advanced Manufacturing and Education; Biomedical Engineering: Translating Research into Clinical Practice; Solving Complex Dynamics and Control Problems; AI and Machine Learning in Industrial Applications; and Adding Entrepreneurial-Minded Learning to Mechanical Engineering Education.

Tours are available on most days of the meeting, please be sure to register for them online. They include the Louisiana Steam Train Museum, the Lake Borgne Surge Barrier, and state-of-the-art manufacturing facilities, including Intralox Manufacturing and NASA’s Michoud Assembly Facility.

On behalf of the entire Conference Steering Committee, I thank all of our mechanical engineering community for the exemplary dedication, passion, and effort to make IMECE an open forum for discussion, learning, and professional growth and development. A very special thank you for the volunteer organizers, including track chairs, topic and symposium organizers, session chairs, reviewers, and judges. We also extend our gratitude to the ASME staff for coordinating, supporting, and running this extensive and multifaceted event.

We are very pleased to have New Orleans as the IMECE host city. Since 2000, IMECE has been hosted in 20 different cities across the U.S. and Canada.

We are looking forward to meeting you all at the 2023 IMECE!

Sincerely,

Albert Ratner
IMECE 2023 Technical Program Chair
IMECE 2022 Technical Program Chair
Albert Ratner  
Technical Program Chair  
University of Iowa

Reuben Kraft  
Technical Program Vice Chair  
Penn State University

Dumitru “Micky” Caruntu  
Conference Chair  
The University of Texas Rio Grande

Christopher Depcik  
Steering Committee Chair  
The University of Kansas

Marriner Merrill  
Steering Committee Vice Chair  
Rochester Institute of Technology

Alberto Cuitino  
Steering Committee Senate Chair  
Rutgers, The State University of New Jersey

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

George Kardomea  
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

Wenbin Yu  
Member at Large  
Purdue University
ASME (Booth 511)
Two Park Avenue
New York, NY 10016-5990 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 New Orleans Ernest N. Morial 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 282 on the second floor of the New Orleans Ernest N. Morial 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 2023 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.”

BUSINESS CENTER

There is a UPS business center in the convention center, see the hours below.

Hours of Operation
- **Saturday, October 28**: 10:00AM–1:00PM
- **Sunday, October 29**: 1:00PM–3:00PM
- **Monday, October 30**: 7:00AM–4:00PM
- **Tuesday, October 31**: 7:00AM–4:00PM
- **Wednesday, November 1**: 7:00AM–4:00PM
- **Thursday, November 2**: 7:00AM–4:00PM

CHILDCARE SERVICES

We are pleased to once again offer childcare reimbursement for attendees of IMECE 2023. For those who need childcare services, ASME will reimburse up to a total of $250 per registered attendee for services incurred by a licensed service provider in New Orleans, LA. This offering will be available October 29–November 2 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, 2023.

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.

**Dependable In Home Care**
- Website: [www.dependablecare.net](http://www.dependablecare.net)
- Phone: (504) 486-5044

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.
CONTINENTAL BREAKFAST

Continental breakfast will be served on Monday, October 30 through Thursday, November 2 in La Nouvelle Orleans Ballroom C in the New Orleans Ernest N. Morial Convention Center. Fully paid attendees are entitled to attend. The schedule is as follows:

<table>
<thead>
<tr>
<th>Day</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monday, October 30</td>
<td>7:30AM – 8:00AM</td>
</tr>
<tr>
<td>Tuesday, October 31</td>
<td>7:30AM – 8:00AM</td>
</tr>
<tr>
<td>Wednesday, November 1</td>
<td>7:30AM – 8:30AM</td>
</tr>
<tr>
<td>Thursday, November 2</td>
<td>7:30AM – 8:00AM</td>
</tr>
</tbody>
</table>

**New Orleans Theater Lobby**

EMS

Need non-emergency medical assistance? EMS staff will be on-site during the conference outside of hall H on the 1st floor of the convention center.
LUNCH

Conference lunches will be served Monday–Wednesday, October 30–November 1, in Hall G of the New Orleans Ernest N. Morial Convention Center. On Thursday, November 2, lunch is served in La Nouvelle Orleans Ballroom C. Fully paid attendees are entitled to attend. The schedule is as follows:

- **Monday, October 30**: 12:30PM – 1:30PM
- **Tuesday, October 31**: 12:00PM – 1:00PM
- **Wednesday, November 1**: 12:30PM – 1:30PM
- **Thursday, November 2**: 12:15PM – 12:45PM

*La Nouvelle Ballroom C

MEETING INFORMATION

Main meeting information is located on the 2nd floor of the New Orleans Ernest N. Morial Convention Center across from Room 260. The operating hours are:

- **Sunday, October 29**: 10:00AM – 6:00PM
- **Monday, October 30**: 7:00AM – 6:00PM
- **Tuesday, October 31**: 7:00AM – 6:00PM
- **Wednesday, November 1**: 7:00AM – 6:00PM
- **Thursday, November 2**: 7:00AM – 5:45PM

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](http://www.asme.org/membership) for more information about the benefits of ASME Membership.

MOTHER’S ROOM

The New Orleans Ernest N. Morial Convention Center has Mother’s Room near the restrooms by Halls B and H. Stop by Registration if you need assistance locating the rooms.

OPENING RECEPTION

Exhibit Hall Grand Opening and Opening Reception

**Sunday, October 29**

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.
5:30PM – 7:00PM  
Hall G, New Orleans Ernest N. Morial 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.

**POSTER PRESENTATIONS**

Poster presentations will be held at the following times:

**Sunday, October 29**  
5:30PM – 7:00PM  
Hall G, New Orleans Ernest N. Morial 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 3**  
12:00PM – 3:00PM  
Hall G, New Orleans Ernest N. Morial Convention Center  

**NSF Student Competition (Posters Only)**  
Poster Setup: 9:00AM – 10:00AM  
Judging: 10:00AM – 2:15PM  
General Viewing: 12:00PM – 2:15PM  
Awards: 2:15PM – 2:30PM  

**Research Podium (Posters Only)**  
Poster Setup: 9:00AM – 10:00AM  
Judging: 10:30AM – 1:45PM  
General Viewing: 12:00PM – 2:30PM  

**SOCIAL MEDIA**

Let’s be social! We encourage you to use the hashtag #IMECE2023 to tag your social media posts and photos throughout the conference.
PRAYER ROOM

Room 287 on the second floor of the New Orleans Ernest N. Morial 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: IMECE2023 CONFERENCE PAPERS AND PROCEEDINGS

Technical papers accepted for publication for IMECE2023 will be available through a dedicated Online Papers site available to all fully paid attendees beginning a week before the conference.

- The ISO batch file and two zip files also 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 Room 270 and 287
Monday, October 30 10:30AM – 10:45AM
Tuesday, October 31 10:00AM – 10:15AM
Wednesday, November 1 10:30AM – 10:45AM
Thursday, November 2 10:00AM – 10:15AM

Afternoon Break, Exhibit Hall G unless otherwise noted
Monday, October 30 3:00PM – 4:45PM
Tuesday, October 31 3:30PM – 4:00PM
Wednesday, November 1 2:00PM – 3:45PM
Thursday, November 2 3:45PM – 4:15PM *Outside of Rooms 270 and 287

REGISTRATION

Conference registration will be located on the third floor of the Hilton Riverside on Saturday and Sunday. Registration will move to the Hall G lobby on the first floor of the New Orleans Ernest N. Morial Convention Center for the Technical Program on Sunday and for the Committee Meetings on Monday. The operating hours are:

Saturday, October 28 7:00AM – 6:00PM Hilton Riverside
Sunday, October 29 7:00AM – 6:00PM, Hilton Riverside
                      12:00PM – 6:00PM, Convention Center
Monday, October 30  7:00AM – 6:00PM, Convention Center
Tuesday, October 31 7:00AM – 6:00PM, Convention Center
Wednesday, November 1 7:00AM – 6:00PM, Convention Center
Thursday, November 2 7:00AM – 5:45PM, Convention Center
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.

GUEST TOUR

Local's Guide to the French Quarter Tour

Date: Sunday, October 29
Time: 1:00pm

Description: Join Unique Tours for a stroll around the French Quarter. You’ll learn about the fascinating beginnings of our city that shaped this world-famous neighborhood. Discover the must-see spots in the French Quarter and learn about the history of the «Vieux Carré». Our local guides will enlighten you about the best bars, restaurants, and hidden gems to see on your visit here.

We will guide you on your tour from the mighty Mississippi River, to buildings older than our country, to present-day curious and unique locales. Understand why people become captivated with our city and keep coming back for more.

Book Here: https://uniquenola.com/asme/
TECHNICAL TOURS

ALL TOUR BUSES LEAVE FROM THE TRANSPORTATION CENTER AT THE NEW ORLEANS ERNEST N. MORIAL CONVENTION CENTER. THERE WILL BE SIGNAGE AND STAFF TO DIRECT YOU.

Monday, October 30,  9:30AM – 11:30AM

Louisiana Steam Train Tour

Description: Southern Pacific 745 is a Mikado-type (2-8-2) steam locomotive is regarded as a classic among steam locomotives, and for its significance, it was placed on the U.S. National Register of Historic Places. SP745 is one of a small batch of locomotives built by Southern Pacific at its Algiers shops just outside of New Orleans. Number 745 was built in 1921, based on the 1913 Mk-5 class design and is the last surviving steam locomotive built-in Louisiana. ASME visitors to the LASTA facility will hear from volunteers who operate, maintain, and will be involved in the rebuild of SP745. Visitors will have the opportunity to climb aboard the engine.

Please plan to board the bus at 9:30AM. The tour will depart at 9:40AM and arrive back to the New Orleans Ernest N. Morial Convention Center at approximately 12:00PM. The bus will depart/ drop off from the Transportation Center at the New Orleans Ernest N. Morial Convention Center.
Tuesday, October 31, 9:30AM – 12:00PM

LAKE BORNGNE SURGE BARRIER TOUR

Description: As part of the approximately $4 Billion Hurricane Storm Damage Risk Reduction System (HSDRRS), which spans three parishes (Orleans, East Jefferson, and St. Bernard), the Lake Borgne Surge Barrier is a 1.8 mile-long storm surge barrier that was constructed in 2013 by the U.S. Army Corps of Engineers. The tour will take approximately 60–90 minutes (depending on the questions), is conducted mainly outside at the northern end of the Barrier, and includes a brief walking tour and multimedia presentation of the Flood Protection Authority-East’s role in maintenance and operations of all components of the HSDRRS within its jurisdiction.

Please plan to board the bus at 9:30AM. The tour will depart at 9:40AM and arrive back to the New Orleans Ernest N. Morial Convention Center at approximately 12:00PM. The bus will depart/drop off from the Transportation Center at the New Orleans Ernest N. Morial Convention Center.
Wednesday, November, 1:00PM – 4:00PM

INTRALOX MANUFACTURING AND ENGINEERING TOURS (HARAHAN CAMPUS)

Description: Don’t miss the opportunity to visit Intralox’s global headquarters. Experience the company’s manufacturing operations up close and meet the experts that make Intralox reliably inventive. Following a brief intro meeting where examples of CAD/CAE simulation will be shown, guided tours will include:

Please plan to board the bus at 1:00PM. The tour will depart at 1:10PM and arrive back to the New Orleans Ernest N. Morial Convention Center at approximately 4:00PM. The bus will depart/drop off from the Transportation Center at the New Orleans Ernest N. Morial Convention Center.

Thursday, November 2, 8:15AM–11:00AM

NASA MICHOUD ASSEMBLY FACILITY

Description: Visitors to the Michoud Assembly Facility can observe production of NASA’s Artemis Program’s Space Launch System. Technicians use state-of-the-art manufacturing and welding equipment — including a friction-stir-welding tool that is the largest of its kind in the world- to manufacture SLS and the Orion spacecraft. The SLS core stage will send the Orion spacecraft to the moon and beyond.

**Please note this tour can only accommodate U.S. citizens. ASME will share your name and contact information with the facility for security clearance. This will be the only time that this tour can take place during IMECE. Please do not contact the facility; they are not able to offer outside tours at this time.

Please plan to board the bus at 8:15AM. The tour will depart at 8:25AM and arrive back to the New Orleans Ernest N. Morial Convention Center at approximately 11:00AM. The bus will depart/drop off from the Transportation Center at the New Orleans Ernest N. Morial Convention Center.
ASME LANDMARK

#3 A.B. Wood Screw Pump
1914

Most advanced low-lift drainage pump in use in the early 20th century, later used worldwide. With a water table several feet below ground level, New Orleans faced a crisis after every heavy rainfall, not just through flooding but also through disease (yellow fever and malaria) caused by impure water. New Orleans was dependent on mechanical means for lifting water from its canals and sewage systems.

A. Baldwin Wood (1879–1956), a young assistant city engineer, designed and installed a system of large screw pumps (axial flow machines) to syphon water and accelerate drainage. By 1915, the Wood screw pump became the most advanced drainage pump in use. After their successful operation in New Orleans, Wood’s pumps were built in the Netherlands, Egypt, China, and India. Wood also redesigned Chicago’s drainage system.

LANDMARK LOCATION

New Orleans Sewerage and Water Board
625 St. Joseph
New Orleans, LA 70165

Visiting Info
Contact the Water Board for appointment and security clearances, through the Community and Intergovernmental Relations office: (504) 585-2169

#101 St. Charles Avenue Streetcar Line
1835

Oldest surviving interurban-urban passenger rail transport system in the United States

The St. Charles Avenue Streetcar Line is the oldest surviving interurban-urban passenger rail transportation system in the United States. Originally incorporated as the New Orleans Carrollton Rail Road in 1833, service began in 1835. A variety of motive power had been used including horses, mules, overhead cable, steam engines, and ammonia engines before electrification in 1893. The 900-series cars presently in service were designed and built by the Perley A. Thomas Car Company of High Point, North Carolina, in 1923 to 1924. They operate on the original fifteen-mile right-of-way with a 5-foot, 2 1/2-inch gage track that was adopted in 1929.

LANDMARK LOCATION

Regional Transit Authority of New Orleans
New Orleans, LA

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

Hilton Hotel
Hilton Hotel
Special Events
SPECIAL EVENTS

SUNDAY

ASME Business Meeting
4:00PM–4:30PM
Jefferson Ballroom, Third Floor, Hilton Riverside

First-Time Attendees Orientation
2:30PM–3:30PM
Room 261, 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.

Exhibit Hall Grand Opening and Opening Reception
5:30PM–7:00PM
Hall G, 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.

MONDAY

Opening Keynote Event
8:00AM–9:15AM
(breakfast served from 7:30AM to 8:00AM)
La Nouvelle C, Convention Center

Keynote Speaker:
E. Glenn Lightsey, Ph.D.
David Lewis Professor of Space Systems Technology
Georgia Institute of Technology

Keynote Title: Small Satellites and the Future of Planetary Space Exploration

Undergraduate Research and Design Expo Student Poster Competition
5:30PM–7:00PM
Hall G, 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.
Abstract: Small satellites are redefining the way new technology is developed and infused into space missions. This talk will begin by describing the Lunar Flashlight mission—an advanced technology mission using a small satellite to look for ice at the Moon’s South Pole. Lunar Flashlight is a NASA mission with university participation that was launched on a commercial rocket in 2022. Lunar Flashlight is an example of changes that are occurring in space technology across the space industry. We then discuss how these changes are influencing interplanetary space exploration to the Moon and Mars, and what could happen with planetary space exploration in the next 25 years.

Biography: Dr. Glenn Lightsey is the David Lewis Professor of Space Systems Technology in the School of Aerospace Engineering at Georgia Tech. He is the Director of the Center for Space Technology and Research, an interdisciplinary research center that facilitates space research at Georgia Tech. He is the Co-Principal Investigator for the Lunar Flashlight mission at Georgia Tech, which designed the propulsion system and conducts mission operations.

Dr. Lightsey founded two companies that create space technology, and he has co-authored more than 160 technical publications. He is a member of the National Academy’s Space Technology Industry, Government, and University Roundtable. Dr. Lightsey has received the AIAA’s Mechanics and Control of Flight Award and the Institute of Navigation’s Tycho Brahe Award.

Women in ME and ASME
5:00PM–6:00PM - Panel
6:00PM–7:00PM - Reception

Room 396, Convention Center

Moderator: Caterina Rizzi, University of Bergamo, Italy
Panelists/Speakers:
- Judith Bamberger, Pacific Northwest National Laboratory
- Karen Ohland, Princeton University Art Museum, ASME Past President
- Assimina Pelegri, Rutgers University
- Xiaozhi (Christina) Wang, ABS Corporate
- Olesya Zhupanska, The University of Arizona

Women in ME and ASME networking event features a panel and a reception. The panel will discuss the growing presence of women in mechanical engineering and ASME, their roles and strategies to close the gender gap. It will address challenges and strategies in the field and a live question and answer session will be featured so that the audience can engage with these panelists.

The reception will provide opportunities for IMECE female participants to recognize achievement of other female ASME members, to build and grow professional networks, and to facilitate mentorship. During the reception Food and Beverages will be provided. At the end of the Panel an Award Ceremony will take place. This is not a women-only event – all IMECE participants are welcome and invited to join the event!

Please feel free to join just the Reception if the panel happens to overlap with a technical session of your interest.

Sponsors:
- Aerospace Division
- Applied Mechanics Division
- Computers & Information In Engineering Division
- Materials Division
- Congress Steering Committee (CSC)
- Technical and Engineering Communities Sector (TEC)

TUESDAY

Keynote Lecture-ASME Robert Henry Thurston Lecture Award
8:00AM–9:00AM
(breakfast served from 7:30AM to 8:00AM)
La Nouvelle C, 2nd Level, Convention Center
Keynote Speaker:
Ramamoorthy Ramesh, Ph.D.
Vice President for Research
Rice University

Keynote Title: Energy: The True Final Frontier

Abstract: More than five decades ago, President Kennedy exhorted the nation to rise up and meet the biggest challenges of that period, amongst them being the Race to the Moon, that led to the establishment of NASA and the Apollo program. In one of the most stirring presidential speeches, he urged the nation to “ask not what the country can do for you, but what you can do for the country.” It is quite likely that we, as a nation (and the world), are once again at crossroads, from many perspectives. I will use Energy as a “Clear and Present” example of where we, as scientists, engineers, young and not-so-young, need to rise up and meet the challenges that we are faced with. Energy and Water are perhaps the most pressing issues of our generation. I will argue that Materials are the most strategic enablers of both fields. A few years ago, I had the opportunity to serve the nation in the role of the founding Director of the DOE Sunshot Initiative, which was designed to bring solar electricity down to grid parity. The huge impact of Sunshot and more generally, Solar, is already being felt with prices of solar electricity dropping rapidly. More recently, I had the opportunity to help shape the “Earthshots,” aimed at solving the biggest problems in Energy and Climate Change. In this talk, I will attempt to take you through, from the “Macro” global energy economics down to what fundamental materials physics can do to help solve the key problems in Energy Efficient Electronics.

Biography: Ramesh pursues key materials physics and technological problems in complex multifunctional oxides. Using conducting oxides, he solved the 30-year enigma of polarization fatigue in ferroelectrics. He pioneered research into manganites coining the term, Colossal Magnetoresistive (CMR) Oxides. His work on multiferroics demonstrated electric field control of ferromagnetism, a critical step towards ultralow power memory and logic elements. His extensive publications (>650) on the synthesis and materials physics of complex oxides are highly cited (over 100,000 citations, H-factor over 150). He is a fellow of APS, AAAS, and MRS and an elected member of the U.S. National Academy of Engineering, a Foreign member of the Royal Society of London, the Indian National Science Academy, the Indian National Academy of Engineering, and a Fellow of the American Academy for Arts and Sciences. His awards include the Humboldt Senior Scientist Prize, the MRS Turnbull lectureship prize, the APS Adler Lectureship and McGroddy New Materials Prize, the TMS Bardeen Prize and the IUPAP Magnetism Prize, and Neel Medal and the Europhysics Prize in 2022. He was recognized as a Thomson-Reuters Citation Laureate in Physics for his work on multiferroics. He served as the Founding Director of the successful Department of Energy SunShot Initiative in the Obama administration, envisioning and coordinating the R&D funding of the U.S. Solar Program, and spearheading the reduction in the cost of Solar Energy. He also served as the Deputy Director of Oak Ridge National Laboratory and the Associate Lab Director at LBNL. Most recently, he served on the Biden–Harris Transition Team for Energy. He is also a co-founder of Kepler Computing, which is focused on low power computing based on his work on ferroelectrics.
SPECIAL EVENTS

NSF Proposal Writing Workshop
10:15AM–12:00PM
Room 298, Convention Center

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.

New NSF Research Opportunities - CBET
10:15AM–11:15AM
Room 298, Convention Center

Representatives from CBET will introduce new funding opportunities and current NS 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.

Bergles-Rohsenow Young Investigator Award in Heat Transfer
12:00PM–1:30PM
Room 389, Convention Center

For outstanding early-career contributions to the application of radiative heat transfer science to solar thermal and thermochemical technologies

Rohini Bala Chandran

George Westinghouse Gold Medal
12:00PM–1:30PM
Room 389, Convention Center

For outstanding and innovative contributions to the development of novel methods for the production of electricity and the optimization of power plants

George Tsatsaronis

George Westinghouse Silver Medal
12:00PM–1:30PM
Room 389, Convention Center

For leadership in research and education in the application of additive manufacturing relevant to gas turbine cooling and heat exchange

Stephen Lynch
Heat Transfer Memorial Awards
12:00PM–1:30PM
Room 389, Convention Center

General- For international leadership and seminal contributions to microscale heat transfer by establishing the dual-phase-lag model for ultrafast phenomena, publishing the first book in this area, and founding a major international conference on microscale and nanoscale heat and mass transfer.

D.Y. “Robert” Tzou
University of Missouri

Science- For sustained and outstanding scholarly contributions to thermal science and engineering, including heat transfer enhancement, phase change heat transfer with and without electrohydrodynamic forces, and dynamics of liquid jet and droplet impingement

Gautam Biswas
Indian Institute of Technology Kanpur

Art- For significant contributions of heat transfer engineering to the design, demonstration and characterization of efficient concentrating solar thermochemical reactors and components, including heat recovery systems and materials for production of renewable fuels

Jane H. Davidson
University of Minnesota

New NSF Research Opportunities - MSI
2:00PM–3:00PM
Room 297, Convention Center

Representatives from the Manufacturing Systems Integration (MSI) program, a new core program at the intersection of several programs/clusters in NSF’s CMMI division launched in February of this year, will introduce the program, provide updates (first awards made, participation in related programs, etc.), engage the community in Q&A, and solicit input for growth of research for the field and program. This panel will be of greatest benefit to current faculty members (all ranks) at U.S. Institutions.
SPECIAL EVENTS

Edward F. Obert Award
Advanced Energy Systems Division Lecture & Reception
4:00PM–6:30PM
Room 389, Convention Center

For the paper titled, Exergy Analysis of Photovoltaics Coupled with Electrochemical Energy Storage for Lunar Power Applications

Phillip Dyer  George J. Nelson  Griffin Smith

ME Department Heads Reception
6:00PM–7:30PM
Room 394, Convention Center

Per Bruel Gold Medal for Noise Control and Acoustics
Noise Control and Acoustics Division: Per Bruel Gold Medal Award & NCAD
6:00PM–7:30PM
Room 399, Convention Center

For unique innovations to the application of metamaterials that enable highly efficient air-permeable sound silencing and noise reduction at desired frequencies, addressing long-standing noise issues in a wide range of mechanical systems

Xin Zhang
**SPECIAL EVENTS**

**Daniel C. Drucker Medal**
Banquet of the Applied Mechanics Division  
6:00PM–9:00PM  
Room 391–392, Convention Center

For outstanding and fundamental contributions to dynamic fracture mechanics, wave propagation in granular media, and underwater implosion phenomena

Arun Shukla

**Warner T. Koiter Medal**
Banquet of the Applied Mechanics Division  
6:00PM–9:00PM  
Room 391–392, Convention Center

For pioneering research on fracture mechanics, including crack-bridging of fiber cements, coarse-grained ceramics, and stitched composites; composite interface characterization; and methods for determining plane stress toughness of ductile polymers

Yiu-Wing Mai

**Thomas K. Caughey Dynamics Medal**
Banquet of the Applied Mechanics Division  
6:00PM–9:00PM  
Room 391–392, Convention Center

For outstanding achievements in nonlinear dynamics and controlled mechanical systems that revealed the essential roles of delayed feedback and hysteretic memory and improved the design of nonlinear vibration control, active flutter suppression, and deployable space structures

Haiyan Hu

**Timoshenko Medal**
Banquet of the Applied Mechanics Division  
6:00PM–9:00PM  
Room 391–392, Convention Center

For pioneering contributions to the mechanics of engineering materials and biological systems, especially in extreme mechanical environments

Guruswami Ravichandran

**ASME Medal**
Banquet of the Applied Mechanics Division  
6:00PM–9:00PM  
Room 391–392, Convention Center

For contributions to fundamental solid mechanics and the emerging research field of mechanomaterials at the interface of solid mechanics, structure mechanics, mechanics of materials, materials science, biology, and data science

Huajian Gao
SPECIAL EVENTS

WEDNESDAY

Networking Breakfast
7:30AM-8:30AM
La Nouvelle, Convention Center

This hot breakfast will be open to all attendees, particularly minority and underrepresent groups, untenured faculty members, and close-to-graduation students. Each table will have a theme (e.g. “The First Year as a Professor” or “Increasing Diversity in Academic Settings”) with a mentor/moderator. The Networking Breakfast is made possible by an award from NSF.

New NSF Research Opportunities - DCC
8:30AM–9:30AM
Room 265, Convention Center

Representatives from 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.

Adding Entrepreneurial-Minded Learning to Mechanical Engineering Education
8:30AM–9:30AM
Room 263, Convention Center

This presentation will introduce the KEEN Entrepreneurial Minded Learning Framework and discuss how it aligns with modern mechanical engineering education. Strategies for integrating entrepreneurial minded learning into traditional mechanical engineering courses will be discussed. Successful case studies will be presented. Participants will leave with actionable strategies for adding entrepreneurial-minded learning into their courses.

Dr. Pierre Larochelle
Panelist

Dr. Pierre Larochelle
Panelist
Biomedical Engineering: Translating Research into Clinical Practice
8:30AM–9:30
Room 261

This panel aims to connect the dots between cutting-edge research and practical medical applications. Panelists will discuss how recent advancements in biomedical engineering are being transformed into actionable healthcare solutions, such as diagnostic instruments and therapeutic technologies. This is an essential session for anyone invested in the confluence of engineering, medicine and patient care, offering a comprehensive look at the challenges and opportunities in moving scientific discoveries from the lab to the clinic.

Moderator: Dr. Yuan Feng
Panelist: Michael Sacks, Yu-Ping Wang

Moving Forward in the New ICE Age
8:30AM–9:30AM
Room 297, Convention Center

During this talk we will discuss the importance and challenges of decarbonizing the transportation sector. We will untangle the myths of the internal combustion engine (ICE) and argue that, although the use of electrification will continue to rise, the ICE holds a firm place in both future transportation applications and various industrial sectors. With continued research and development in combustion systems, hybridization, renewable fuels, and computer modeling techniques, low-carbon ICE should remain at the heart of transportation systems for years to come.

This talk will introduce the research taking place globally to dramatically reduce the carbon footprint of ICE. Particular focus will be placed on advanced combustion strategies, bio- and electro-fuels, and how computational fluid dynamics, high-performance computing, and artificial intelligence are being leveraged to turn these new engines and fuels into reality. If you are curious how engines can be further improved—and as a result, fit into a low-carbon future—this talk is for you.

Moderator: Dr. Andrea Strzelec
Panelist: Dr. Kelly Senecal
Mapping Out the Road Ahead for IC Engines
10:45AM–12:30PM
Room 297, Convention Center

Last year at IMECE, an industry cross-cutting panel answered the question, “Is there a Future for IC Engines?” with a resounding “Yes!” This year, we have panelists sharing their vision on how IC engines can be part of the sustainable transportation future, by mapping out the strategies that we can use to de-fossilize and reduce the amount of new CO2 that is entering the atmosphere.

Dr. Andrea Strzelec
Moderator

Matt Leuck
Panelist

Tim Shipp
Panelist

Robert Shanz
Panelist

Dr. Bob McCormick
Panelist

New NSF Research Opportunities - CMMI
9:45AM–10:45A
Room 298, Convention Center

National Science Foundation (NSF) CMMI Representatives 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.

Wednesday, November 3
12:00PM–3:00PM
Hall G, Convention Center

NSF Student Competition (Posters Only)

<table>
<thead>
<tr>
<th>Event</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poster Setup</td>
<td>9:00AM–10:00AM</td>
</tr>
<tr>
<td>Judging</td>
<td>10:00AM–2:15PM</td>
</tr>
<tr>
<td>General Viewing</td>
<td>12:00PM–2:15PM</td>
</tr>
<tr>
<td>Awards</td>
<td>2:15PM–2:30PM</td>
</tr>
</tbody>
</table>
Research Podium (Posters Only)

<table>
<thead>
<tr>
<th>Event</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poster Setup</td>
<td>9:00AM–10:00AM</td>
</tr>
<tr>
<td>Judging</td>
<td>10:30AM–1:45PM</td>
</tr>
<tr>
<td>General Viewing</td>
<td>12:00PM–2:30PM</td>
</tr>
</tbody>
</table>

2023 IMECE Feedback Session
2:00PM–3:00PM
Room 252, Convention Center

Engines in Motorsports
2:00PM–3:45PM
Room 297, Convention Center

While a lot of the focus on IC engines is for transportation, whether personal or freight, engines are also a large part of our recreation activities. These sectors are also thinking about how they can reduce their carbon footprint, while keeping us enjoying our motorsports and recreation activities.

Emily Bierman
Product Engineer,
John Deere
Moderator

Jamie McNaughton
Engines Technical Director,
Roush Yates
Panelist

Jason Kehl
Director of Racing, Harley-Davidson Motor Company
Panelist

Russ O'Blenes
Director of Performance & Racing Propulsion Team,
General Motors
Panelist

Alex Wood
Motorsports
Panelist
SPECIAL EVENTS

Nadai Medal—Materials Division
Materials Division Awards Symposium and Reception
3:00PM–6:00PM
Room 395, Convention Center

For pioneering contributions to the development of self-healing polymers and composites

Nancy Sottos

Nemat-Nasser Early Career Award—Materials Division
Materials Division Awards Symposium and Reception
3:00PM–6:00PM
Room 395, Convention Center

For unraveling coupled non-equilibrium processes in stimuli-responsive soft materials to achieve programmable shape morphing and actuation, developing novel mechanical metamaterials for reusable energy absorption and reversible shape transformation, and furthering understanding of the stretchability of electronic materials and devices

Lihua Jin

2023 IMECE Track Organizers and Co-Organizers Meeting
3:00PM–4:00PM
Room 261, Convention Center

Noise Control and Acoustics Division: Rayleigh Lecture
4:00PM–5:30PM
Room 389, Convention Center

Nonlinear Damping and Active Control in Vibrations: Modelling and Experiments

Marco Amabili
THURSDAY

Advanced Manufacturing and Education
8:00AM–9:00AM
Room 262, Convention Center

In addition to new technological advancements and scientific innovations in Advanced Manufacturing, innovative and integrated education plans would be an integral part of workforce development and building the future of the modern manufacturing industry. In fact, strategic education plans are necessary to cope with the increasing industrial requirements of future manufacturing. This interactive roundtable focuses on effective and innovative pedagogical methods that can be potentially used for teaching undergraduate and graduate manufacturing courses, e.g., additive manufacturing, manufacturing processes, manufacturing design, and materials for manufacturing. Effective education methods not only integrate manufacturing education with industrial practice, but also pave the way for establishment of integrated manufacturing education and research plans in academia. Authors and presenters from both industry and academia are invited to attend this event and share their opinions.

Roozbeh “Ross” Salary
Moderator
Thomas R. Kurfess
Panelist
Kathryn Jablokow
Panelist

Exploring the Latest Advances in Acoustics and Vibration Control
8:00AM–9:00AM
Room 261, Convention Center

Dr. Yousof Azizi
Bridgestone Americas and The University of Akron

Mahmoud Hussein
University of Colorado Boulder Panelist

Weidong Zhu
University of Maryland, Baltimore County Panelist
Artificial Intelligence in Space Exploration and Habitat Development
8:00AM–9:30AM
Room 292, Convention Center

This panel brings together experts in both artificial intelligence and aerospace to explore the synergy between these two revolutionary fields. Panelists will discuss how AI technologies are being utilized for tasks ranging from autonomous spacecraft navigation to data analysis in cosmic research. Don’t miss this enlightening session if you’re interested in the next frontier of AI applications, offering invaluable insights into both current uses and future possibilities in space exploration and beyond.

Sponsored by the Space Exploration and Habitats Technology Group

Assimina Pelegri
Co-Organizer & Co-Moderator

Joseph R. Smith
Co-Organizer & Co-Moderator

Danielle DeLatte
Panelist

Michael R. Durling
Panelist

Daniel Inocente
Panelist

Lisa Thomas McGee
Panelist

SPECIAL EVENTS
Human-Robot Collaboration & AI Integration Workshop
10:30AM–12:00PM and 2:00PM–6:00PM
Room 299, Convention Center

Lead Organizers: Gloria Wiens and Irene Fassi

To engage stakeholders from academe, industry, and government in the areas of robotics, human-robot interaction/collaboration, and AI integration. Technology focus includes robotics, automation, AI, safety, and other relevant Industry 4.0/5.0 technologies.

Session I

Welcome and Opening Remarks
Bruce Kramer, NSF
Lorenzo Molinari Tosatti, STIMA-CNR

Risk and Safety for HRC Panel
Panelists:
Jeremy Marvel, NIST
Irene Fassi, STIMA-CNR

Session II
HRC – AI Integration

Moderator: Robert Gao, Case Western Reserve University
State of the Art, Research and Application – End Users
Presenters: To Be Confirmed

Intelligent Human-Robot Collaboration for Smart Factory
Presenters:
Zhaozheng Yin, Stony Brook University
MD Moniruzzaman, Stony Brook University
Ming Leu, Missouri University of Science and Technology
Robert Gao, Case Western Reserve University
Gloria Wiens, University of Florida
Jared Flowers, University of Florida

ASME Robotics Roadmap Briefing and Discussion
Presenters:
Ashis Banerjee, University of Washington
Stephen Canfield, TN-Tech
Jeff Ge, Stonybrook University

Sponsored by: ASME/Manufacturing Engineering Division (MED) and ARM Institute.

Co-hosted by: ASME Robotics Technology
SPECIAL EVENTS

Closing Keynote Event
12:15PM–1:45PM
(lunch served from 12:15PM to 12:45PM)
La Nouvelle C, Convention Center

Keynote Speaker:

Eleanor Morgan
Program Manager & Habitation Architecture Lead
Lockheed Martin Space

Keynote Title: Architectures for Deep Space Missions

Abstract: Recent advancements in space transportation systems (such as reusable launch vehicles) and the successful completion of NASA’s Artemis I lunar mission have ushered in a new era of human spaceflight, enabling astronauts to once again travel beyond low earth orbit. With the burgeoning age of crewed space exploration, new technologies and support systems will need to be developed to sustain humans for longer periods of time in deep space. During this talk, Eleanor will discuss the mission architectures for future orbital, surface, and transport spacecraft that Lockheed Martin is working on in collaboration with industry, academia, and government partners, which will enable future expeditions to the Moon and Mars.

Biography: Eleanor Morgan currently serves as a Program Manager and Habitation Architecture Lead for Lockheed Martin’s space habitation development programs. In this role, she oversees the development and mission architecture for various orbital, surface, and transport spacecraft for low earth orbit and future expeditions to the Moon and Mars. Previously, she also led Lockheed’s joint partnership projects with Nanoracks and General Motors for the development of the next-generation commercial space station and lunar rover.

Her previous industry experience has included leading systems engineering and crew systems development for inflatable space habitats at Bigelow Aerospace and conducting human spaceflight research at NASA’s Johnson Space Center as part of their Human Exploration & Research Analog (HERA) program. She also serves as member and technical session chair for the International Astronautical Federation’s Human Spaceflight committee.

Prior to her space career, she was an active-duty combat aviator in the Air Force for 12 years and continues to serve today as a Major in the Air Force Reserve. Eleanor is also a recipient of two national awards for her contributions to military aviation, human space exploration, and her extensive youth and female STEM outreach and mentorship activities. She holds a bachelor’s in systems engineering from the U.S. Air Force Academy, a masters in space studies from American Military University, and is currently an Executive MBA candidate at MIT’s Sloan School of Management.
Track Plenary Sessions
Track 1: Acoustics, Vibration, and Phononics

Wednesday, November 1, 2023,
9:45AM – 10:30AM
Room 261
New Orleans Ernest N. Morial Convention Center

Acoustofluidics: Merging Acoustics and Fluid Mechanics for Biomedical Applications

Dr. Tony Jun Huang
Duke University

Abstract: The use of sound has a long history in medicine. Dating back to 350 BC, the ancient Greek physician Hippocrates, regarded as “the father of medicine,” devised a diagnostic method for detecting fluid in the lungs by shaking patients by their shoulders and listening to the resulting sounds emanating from their chest. As acoustic technology has advanced, so too has our ability to “listen” to the body and better understand underlying pathologies. The 18th century invention of the stethoscope allowed doctors to gauge the health of the heart; the 20th century invention of ultrasound imaging revolutionized the field of biomedical imaging and enabled doctors to diagnose a range of conditions in the fields of obstetrics, emergency medicine, cardiology, and pulmonology. In the last decade, a new frontier in biomedical acoustic technologies has emerged, termed acoustofluidics, which joins cutting-edge innovations in acoustics with micro- and nanoscale fluid mechanics. Advances in acoustofluidics have enabled unprecedented abilities in the early detection of cancer, the non-invasive monitoring of prenatal health, the diagnoses of traumatic brain injury and neurodegenerative diseases, and have also been applied to develop improved therapeutic approaches for transfusions and immunotherapies. In this talk, I summarize our lab’s recent progress in this exciting field and highlight the versatility of acoustofluidic tools for biomedical applications through many unique examples, ranging from the development of high-purity, high-yield methods for the separation of circulating biomarkers such as exosomes and circulating tumor cells, to highly precise, biocompatible platforms for manipulating cells and studying cell-cell communication, to high-throughput therapeutic approaches for platelet isolation and enrichment, to strategies for high-resolution 3D bioprinting, to programmable, contact-free technologies for digital fluid manipulation. These acoustofluidic devices can precisely manipulate objects across seven orders of magnitude (from a few nanometers to a few centimeters). Thanks to these favorable attributes (e.g., versatility, precision, and biocompatibility), acoustofluidic devices harbor enormous potential in becoming a leading technology for a broad range of applications, playing a critical role for translating innovations in technology into advances in biology and medicine.

Bio: Tony Jun Huang is the William Bevan Distinguished Professor of Mechanical Engineering and Materials Science at Duke University. Previously, he was a professor and the Huck Distinguished Chair in Bioengineering Science and Mechanics at The Pennsylvania State University. He received his Ph.D. degree in Mechanical and Aerospace Engineering from the University of California, Los Angeles (UCLA) in 2005. His research interests are in the fields of acoustofluidics, optofluidics, and micro/nano systems for biomedical diagnostics and therapeutics. He has authored/co-authored over 260 peer-reviewed journal publications in these fields. His journal articles have been cited more than 29,000 times, as documented at Google Scholar (h-index: 91). He also has 26 issued or pending patents. Prof. Huang was elected a fellow (member) of the National Academy of Inventors (USA) and the European Academy of Sciences and Arts. He was also a fellow of the following six professional societies: American Association for the Advancement of Science (AAAS), the American Institute for Medical and Biological Engineering (AIMBE), the American Society of Mechanical Engineers (ASME), the Institute of Electrical and Electronics Engineers (IEEE), the Institute of Physics (UK), and the Royal Society of Chemistry (UK). In addition, he has receive many prestigious awards and honors, including a 2010 National Institutes of Health (NIH) Director’s New Innovator Award, a 2012 Outstanding Young Manufacturing Engineer Award from the Society for
Manufacturing Engineering, the 2014 IEEE Sensors Council Technical Achievement Award from IEEE, the 2017 Analytical Chemistry Young Innovator Award from the American Chemical Society (ACS), the 2019 Van Mow Medal from ASME, and the 2019 Technical Achievement Award from the IEEE Engineering in Medicine and Biology Society (EMBS). In 2022, he was named to a global list of the most highly cited researchers (cross field) by Clarivate (Web of Science).

Track 1: Acoustics, Vibration, and Phononics

Thursday, November 2, 9:15AM–10:00AM
Room 261
New Orleans Ernest N. Morial Convention Center

Engineering Intentional Nonlinearity in Acoustics and Phononics

Dr. Alexander F. Vakakis
University of Illinois at Urbana–Champaign

Abstract: We explore the intentional implementation of strong nonlinearity in acoustical and phononic waveguides, with the aim of enabling passive targeted energy transfer (TET) and management in these systems. This is a predictive engineering approach whereby externally induced or self-excited broadband/narrowband energy, is either irreversibly directed in preferential paths/modes, rapidly scattered in the frequency/wavenumber domains, dissipated locally, or harvested at a priori designated sites. Interestingly, such directed energy transfers and management mimic analogous irreversible energy cascades in Nature, e.g., in turbulent flows or granular assemblies, and, as such, benefit from the well-known robust and enhanced dissipative features exhibited by these natural phenomena. Our approach dictates advanced theoretical modelling and analysis to account for strongly nonlinear effects, robustness studies to avoid unwanted instabilities and/or unaccounted complexity in the acoustics, but also nonlinear system identification, reduced-order modelling, optimization, and experimental validation of theoretical predictions and designs. Unique benefits of this nonlinear approach include passive tunability of the acoustics to energy and frequency/wavelength contents of the applied excitations, as well as drastic and beneficial changes in the global system acoustics by means of the addition of local nonlinear elements. We discuss applications such as directional wave transmission in phononic lattice networks, interband TET in phononic systems, passive ways for breaking acoustic reciprocity in acoustic waveguides with local nonlinearities and asymmetries, nonlinear topological insulators, and granular shock protectors with time-scale disparity in their responses—that is, with the capacity to respond either in the dynamic or the acoustic range depending on the location of the external shock. The aim is to translate this approach to new methods, technologies, applications, and devices that exploit and showcase intentional strong nonlinearity.

Bio: Alexander F. Vakakis received his Ph.D. from Caltech (1990), M.Sc. from Imperial College, London, UK (1985), and Diploma in Mechanical Engineering from the University of Patras, Greece (1984). Currently, he is the Donald Biggar Willett Professor of the College of Engineering of the University of Illinois at Urbana–Champaign (UIUC) where he co-directs the Linear and Nonlinear Dynamics and Vibrations Laboratory (http://lndvl.mechse.illinois.edu/); moreover, he is co-affiliate faculty at the University of Stuttgart, Germany. Among other awards, he is the recipient of the Tau Beta Pi Daniel C. Drucker Eminent Faculty Award from the UIUC College of Engineering (2023), an Alexander von Humboldt Research Award (2019), the Edmond J. Safra Visiting Professorship from Technion (2019), and the ASME Thomas K. Caughey Award in nonlinear dynamics (2014). He has published over 350 archival journal publications, holds four patents, and has authored or edited six technical texts and monographs. Many of his Ph.D. students and postdoctoral fellows are currently faculty members in the U.S. and abroad, and researchers in R&D centers. His research interests...
include nonlinear dynamics, vibrations, and acoustics from the macro- to the micro-scales, passive energy management and targeted energy transfer, nonlinear phononics, acoustic metamaterials, nonlinear system identification, bioengineering, non-smooth dynamics, and vibration energy harvesting.

**Track 2: Advanced Design and Information Technologies**

**Thursday, November 2, 9:15AM – 10:00AM**

**Room 262**

**New Orleans Ernest N. Morial Convention Center**

**Physics-Informed Machine Learning for Physics-Based Data-Driven Design and Manufacturing**

![Dr. Yan Wang](image)

**Dr. Yan Wang**

*Georgia Institute of Technology*

**Abstract:** The essential task in designing products, materials, or processes is to establish the process-structure-property (P-S-P) relationships that enable design optimization. The task, however, is challenging, because the P-S-P relationships are usually very complex and involve a large number of design variables. To explore the high-dimensional design solution space, it is very costly to rely only on experiments or physics-based simulations to obtain high-fidelity P-S-P predictions. Therefore, empirical and data-driven machine learning models can be useful. Nevertheless, data sparsity is the main barrier of using the latest machine learning tools as the surrogates of complex P-S-P relationships. In the last five years, we developed a general framework of physics-informed neural networks to tackle the data sparsity challenge by applying physical models as the constraints to guide the training of neural networks. Novel adaptive weighting scheme as well as multi-fidelity and minimax architectures were proposed to predict complex multiphysics phenomena. To quantify uncertainty, new physics-constrained Bayesian neural networks were also proposed. The new framework has been applied to engineering design problems of heat transfer and phase transition, as well as predictions of temperature, dendritic growth, and grain coarsening to optimize additive manufacturing processes, in combination with scalable Bayesian optimization and physics-based models such as the phase-field thermal lattice Boltzmann method and kinetic Monte Carlo. In addition, to improve the efficiency of data collection in physical experiments, we developed a physics-constrained dictionary learning framework to solve the inverse problem of compressed sensing that is dedicated to manufacturing process monitoring. Data compression, sensor placement optimization, and classification for diagnosis can be performed simultaneously.

**Bio:** Yan Wang, Ph.D. is a Professor of Mechanical Engineering and leads the Multiscale Systems Engineering research group at the Georgia Institute of Technology. The research of the group is at the intersection of design, manufacturing, and materials. His recent interests include materials design, uncertainty quantification, physics-informed machine learning, and quantum scientific computing. He has co-authored over 200 refereed journal and conference publications, including the ones with best conference paper awards at the American Society of Mechanical Engineers (ASME) Computers & Information in Engineering Conference; ASME Multibody Systems, Nonlinear Dynamics, and Control Conference; The Minerals, Metals & Materials Society (TMS) World Congress on Integrated Computational Materials Engineering; the Institute of Industrial & Systems Engineers (IISE) Industrial Engineering Research Conference; and the International CAD Conference. He is a recipient of the U.S. National Science Foundation CAREER Award, a National Aeronautics and Space Administration (NASA) Faculty Fellow, and an ASME Fellow. He currently serves as the Editor-in-Chief of the ASME *Journal of Computing and Information Science in Engineering* and was the Chair of the ASME Computers & Information in Engineering Division and Chair of the Advanced Modeling & Simulation Technical Committee.
Track 3: Advanced Manufacturing

Thursday, November 2, 9:15AM – 10:00AM
Room 263
New Orleans Ernest N. Morial Convention Center

ORNL’s Advancements in Additive, Digital, Composites, and Hybrid Manufacturing

Dr. William Peter
Oak Ridge National Laboratory

Abstract: A thriving and competitive national manufacturing sector is vital to meeting the nation’s goals in clean energy, economics, and security. ORNL performs fundamental research in advanced materials and manufacturing and is home to the Department of Energy’s Manufacturing Demonstration Facility (MDF) supported by the Advanced Materials and Manufacturing Technology Office. The MDF provides access to over 1,100 companies, federal agencies, and universities annually to transfer research knowledge to practice. Research activities include large scale metal deposition, thermoplastic and thermoset printing, hybrid systems performing additive and machining operations, new machine tools, new additive powder bed systems, advanced composites, digital manufacturing solutions, and even infrastructure printing capabilities. This presentation will review some of the more recent advancements in materials and manufacturing and how these technologies are having an impact in clean energy.

Bio: Dr. Bill Peter is the Program Director for Advanced Manufacturing at Oak Ridge National Laboratory. He manages a research portfolio of over $50M annually in advanced manufacturing. Dr. Peter has over 25 years of experience in advanced manufacturing and materials research for energy and national security applications. Bill Peter was the Director for DOE AMMTO’s Manufacturing Demonstration Facility from 2016 to 2022. The MDF is U.S. DOE’s first research facility established to provide industry with affordable and convenient access to infrastructure, tools, and expertise to facilitate rapid adoption of advanced manufacturing. Under Dr. Peter’s direction, the MDF established over $1B of follow-on private funding based on the manufacturing and materials research, developed over a dozen new manufacturing systems, and collaborated with over 250 companies. Dr. Peter has led groups of greater than 160 people in joining research, metal and ceramic processing, carbon fiber and composites, energy storage, separations, manufacturing systems development, techno-economic analysis, and additive manufacturing. He has been the principal investigator for over 30 R&D projects, including research in the areas of powder metallurgy of titanium powders, the fabrication of amorphous/nanocrystalline materials, the processing of Al, Mg, and Fe-based alloys, and additive manufacturing. Dr. Peter has been author or co-author for 90 publications and has won over seven R&D 100 Magazine awards for research in the development of high temperature aluminum alloys, coating solutions for large additive manufacturing, engineered additive manufacturing materials, consolidation of new titanium powders, additive manufacturing of prosthetics, development of a roll mill technology, and the development of laser-fused NanoSHIELD coatings. Dr. Peter was selected as a Fellow for SME in 2020. Dr. Peter received his B.E. from Vanderbilt University in 1996 and his M.S. and Ph.D. from the University of Tennessee in 2002 and 2005, respectively.
Track 3: Advanced Manufacturing

Implementation of the National Strategy for Advanced Manufacturing

**Wednesday, November 1, 2023, 9:45AM – 10:30AM**

**Room: 262**

**New Orleans Ernest N. Morial Convention Center**

**Dr. Bruce Kramer**  
*National Science Foundation*

**Abstract:** The United States is engaged in a global competition in manufacturing and has taken strong actions to revitalize the manufacturing sector, increase the resilience of U.S. supply chains and national security, invest in manufacturing R&D, and train Americans for jobs of the future. The National Strategy for Advanced Manufacturing was developed by the Subcommittee on Advanced Manufacturing of the National Science and Technology Council, established by Congress in 2012 to provide long-term guidance for Federal programs and activities in support of U.S. manufacturing competitiveness. The strategy addresses the development and implementation of advanced manufacturing technologies, the education of an advanced manufacturing workforce, and the establishment of resilient manufacturing supply chains and ecosystems. Each goal is supported by strategic objectives with technical and program priorities. The talk will highlight opportunities for researchers and educators to identify new possibilities for increasing the capabilities and productivity and reducing the environmental impacts of U.S. manufacturing companies and educating the engaged and digital savvy workforce needed to strengthen U.S. manufacturing competitiveness.

**Bio:** Bruce Kramer is a graduate of MIT (S.B., S.M., Ph.D.) and has served on the faculties of Mechanical Engineering of MIT and George Washington University. He is currently the Senior Advisor in the Division of Civil, Mechanical and Manufacturing Innovation of the National Science Foundation, coordinating NSF’s participation in the National Advanced Manufacturing Program. Dr. Kramer previously directed NSF’s Divisions of Design, Manufacture and Industrial Innovation and Engineering Education and Centers. He holds three U.S. patents and is a Fellow of the Society of Manufacturing Engineers and an International Fellow of the School of Engineering of the University of Tokyo. He has received the F.W. Taylor Medal of CIRP, the ASME Blackall Award, and the R.F. Bunshah Medal of the ICMC for his contributions to manufacturing research and the Distinguished Service Award, the highest honorary award granted by the NSF.
Track 4: Advanced Materials: Design, Processing, Characterization, and Applications

Bioinspired Material Mechanics: Digital Discovery, Design, and Manufacturing

Wednesday, November 1, 2023, 9:45AM–10:30AM
Room: 263
New Orleans Ernest N. Morial Convention Center

Markus Buehler
Massachusetts Institute of Technology

Abstract: Digital biomaterials are designed through an integrated approach of large-scale computational modeling, material informatics, and artificial intelligence/machine learning to optimize and leverage novel smart material manufacturing for advanced mechanical properties. Through the use of nanotechnology and additive manufacturing, and bio-inspired methods, we can now mimic and improve upon natural processes by which materials evolve, are manufactured, and how they meet changing functional needs. In this talk we show how we use mechanics to fabricate innovative materials from the molecular scale upwards, with built-in bio-inspired intelligence and novel properties, while sourced from sustainable resources, and breaking the barrier between living and non-living systems. Applied specifically to protein materials, this integrated materiomic approach is revolutionizing the way we design and use materials, and has the potential to impact many industries, as we harness data-driven modeling and manufacturing across domains and applications. The talk will cover several case studies covering distinct scales, from spider webs and silk, to collagen, to biomineralized materials, as well as applications to food and agriculture, and focuses on mechanistic insights using scaling laws and size effect studies.

Bio: Markus J. Buehler is the McAfee Professor of Engineering at MIT (an Institute-wide Endowed Chair), a member of the Center for Materials Science and Engineering and the Center for Computational Science and Engineering at the Schwarzman College of Computing. He holds academic appointments in Mechanical Engineering and Civil and Environmental Engineering. In his research, Professor Buehler pursues new modeling, design, and manufacturing approaches for advanced biomaterials that offer greater resilience and a wide range of controllable properties from the nano- to the macroscale. His interests include a variety of functional material properties including mechanical, optical and biological, linking chemical features, hierarchical and multiscale structures, to performance in the context of physiological, pathological, and other extreme conditions. His methods include molecular and multiscale modeling, design, as well as experimental synthesis and characterization. His particular interest lies in the mechanics of complex hierarchical materials with features across scales (e.g., nanotubes, graphene, and natural biomaterial nanostructures including protein materials such as intermediate filaments and hair, collagen, silk and elastin, and other structural biomaterials). An expert in computational materials science and AI, he pioneered the field of materiomics and demonstrated broad impacts in the study of mechanical properties of complex materials, including predictive materials design and manufacturing. Between 2013 and 2020, Buehler served as Department Head of MIT’s Civil and Environmental Engineering Department. He has held numerous other leadership roles at professional organizations, including a term as President of the Society of Engineering Science (SES). He received numerous awards, including the Feynman Prize, the ASME Drucker Medal, the J.R. Rice Medal, and many others. In 2023, he was elected to the National Academy of Engineering (NAE).
Track 4: Advanced Materials: Design, Processing, Characterization and Applications

Thursday, November 2, 9:15AM–10:00AM
Room: 271
New Orleans Ernest N. Morial Convention Center

Living Machines and Materials

Dr. Taher Saif
University of Illinois at Urbana-Champaign

Abstract: Industrial revolution of the 19th century marked the onset of the era of machines and new materials that transformed societies. However, these machines and materials cannot self assemble or heal themselves. On the other hand, since the discovery of genes, there is a considerable body of knowledge on engineering living cells. It is now possible to envision biohybrid active materials, machines, and robots with living cells and scaffolds. These living materials may become active through a self-assembly process, and the machines may self assemble and emerge from complex interactions between the cells and the scaffolds at various hierarchical levels. We will highlight a few biohybrid machines developed in various labs around the world but discuss in detail a biohybrid swimmer that emerges from interactions between a scaffold and living materials consisting of muscle cells and neurons. While such machines demonstrate the first milestone achieved in this new field of living intelligent robots with unprecedented opportunities, they also highlight the current limitations and gaps in the field. Closing these fundamental gaps will not only pave the way to more complex engineered living systems but will also provide new insight on biological processes and the life itself. A few key challenges and unanswered questions will be discussed.

Bio: Dr. Taher Saif is the Edward William and Jane Marr Gutgsell Professor in the Department of Mechanical Science and Engineering at the University of Illinois at Urbana-Champaign. His current research includes tumor microenvironment, mechanics of neurons and cardiac cells, and development of biohybrid machines with living materials. His research involves exploration of the underlying mechanism of cell–cell and cell–scaffold interactions, as well as the biophysical processes by which cells remodel their microenvironment. He served as the research lead for biohybrid machines group in the NSF Science and Technology Center, EBICS. He is the recipient of 2020 Engineering Science Medal from the Society of Engineering Science and the 2018 Warner T. Koiter Medal from American Society of Mechanical Engineers. He became a Fellow of AAAS in 2023.

Track 5: Advances in Aerospace Technology

Monday, October 30, 9:45AM–10:30AM
Room 261
New Orleans Ernest N. Morial Convention Center

Dynamic Behavior of Additively Manufactured Lattice Structures

Guruswami Ravichandran
Jio Institute

Abstract: Lattice structures are a class of architected cellular materials composed of periodic unit cells with structural elements, including rods and plates. Additive manufacturing techniques, such as 3D printing, allow control and tunability of unit cell geometries, which enable lattice structures to exhibit high stiffness/strength-to-mass ratios. Lattice structures are increasingly used in aerospace and other energy absorption applications involving impact
and transient loading. The design and analysis of such structures require knowledge of their dynamic material properties. The high strain-rate behavior of polymeric Kelvin lattices with rod- and plate-based geometries are investigated using a polycarbonate split-Hopkinson (Kolsky) pressure bar system with high-speed imaging. Both quasi-static and high strain-rate experiments show the formation of a localized deformation band, and the strain-rate effects of lattice specimens correlate with that of the polymeric base material. Dynamic experiments on polymeric and metallic lattice structures are performed using a direct impact technique with high-speed imaging coupled with digital image correlation (DIC). The effect of topology on the transition from transient dynamic to shock compression of polymeric lattice structures with cubic, Kelvin, and octet-truss unit cells is explored. At high impact velocities, the shock compression behavior is characterized by a compaction wave initiating and propagating from the impact surface. One-dimensional shock theory in the form of Rankine-Hugoniot jump conditions is applied using full-field quantitative measurements to quantify the mechanical response, including energy absorption. Explicit finite element simulations are performed to elucidate the dynamic behavior of lattice structures and validate the deformation modes and scaling/property trends.

**Bio:** Guruswami Ravichandran is the Provost and Professor of Engineering at Jio Institute. He previously served as the Otis Booth Leadership Chair of the Division of Engineering and Applied Science and as the Director of the Graduate Aerospace Laboratories (GALCIT) at the California Institute of Technology (Caltech). He received his B.E. in Mechanical Engineering from the University of Madras, and Sc.M. in Engineering and Applied Mathematics and Ph.D. in Engineering (Solid Mechanics and Structures) from Brown University. He is an elected member of the U.S. National Academy of Engineering and Academia Europaea. He is a Fellow of ASME, AAM, and SEM. His awards and honors include being named Chevalier de l’ordre des Palmes académiques by the Republic of France, and receiving the Warner T. Koiter Medal from ASME, A. C. Eringen Medal from SES, and W. M. Murray Lecture Award from SEM. His research interests are in mechanics of materials, including dynamic behavior, micro/nano mechanics, biomaterials and cell mechanics, active materials, and experimental methods.

**Abstract:** Adhesively bonded joint technology is now widely used in aircraft structural designs because of its advantage over conventional fastening systems. Stress concentrations that are unavoidable at fastener areas can be reduced with adhesively bonded joints, and thus fatigue resistance can be significantly improved. Structural weight can be reduced by replacement of the fastener hardware with the adhesive joints. A promising concept in joining laminated structures is the “Pi joint.” The Pi-shaped joint improves performance by increasing the bonding area between adherends. To enhance interfacial strength and toughness, z-pin reinforcement can be effective. A computational model of a z-pin reinforced composite pi joint has been developed and correlated against experimental results. A smeared cohesive zone modeling approach was implemented to represent the effect of z-pinning in an efficient and scalable manner. In the smeared approach, cohesive properties governing the traction-separation response of the z-pin reinforced areas are defined to account for the apparent increase in fracture toughness caused by z-pinning in an averaged sense. 3D Enhanced Schapery Theory with crack band is proposed to account for diffuse damage in the weave of the pi preform. This damage develops due to delamination.
suppression caused by the z-pinning. The numerical model was calibrated using experimental data from pristine and defective z-pinned pi joints subjected to pull-off and side-bend loading. Comparisons of experimental and numerical results show good agreement in terms of structural response, critical loads, and failure modes.

**Bio:** Anthony M. Waas is the Felix Pawlowski Collegiate Chair in Aerospace Engineering at the University of Michigan. He is also a Professor of Mechanical Engineering. Prior to that he was the Richard A. Auhll Department Chair (2018–2023), and Boeing Egtvedt Endowed Chair Professor and Department Chair in the William E. Boeing Department of Aeronautics and Astronautics at the University of Washington (UW), Seattle (2015–2018). His current research interests are robotically manufactured lightweight structures, computational modeling of composite aerostructures, 3D printed lightweight structures, damage tolerance of composite structures, affordable textile composites, and data science applications in modeling of materials and structures. Professor Waas was the Felix Pawlowski Collegiate Chair Professor of Aerospace Engineering and Director, Composite Structures Laboratory at the University of Michigan, from 1988 to 2014, prior to joining UW in January 2015. Professor Waas is a Fellow of the American Institute of Aeronautics and Astronautics (AIAA), the American Society of Mechanical Engineering (ASME), the American Society for Composites (ASC), the American Academy of Mechanics (AAM), and the Royal Aeronautical Society, UK. He is a recipient of several best paper awards, the 2016 AIAA/ASME SDM award, the AAM Jr. Research Award, the ASC Outstanding Researcher Award, and several distinguished awards from the University of Michigan, including the Stephen S. Attwood award for Excellence in Engineering, one of the highest honors for an Engineering faculty member at the University of Michigan. He received the AIAA-ASME-ASC James H. Starnes, Jr. Award, 2017, for seminal contributions to composite structures and materials, and for mentoring students and other young professionals. In 2017, Professor Waas was elected to the Washington State Academy of Sciences, and in 2018 to the European Academy of Sciences and Arts. He is the recipient of the AIAA ICME Prize, 2020; the ASME Warner T. Koiter Medal, 2020; and the AIAA Dryden Lecture in Research, presented at the International Scitech Conference, 2022. Recently, Prof. Waas was elected to the U.S. National Academy of Engineering - Aeronautics and Space Engineering Board.
Bio: Luis Sobrevia, Chilean, holds a B.Sc. in Biology and Natural Sciences from the Universidad del Bio-Bio, M.Sc. in Physiological Sciences from the Universidad de Concepción (Chile), and a Ph.D. in Physiology and Medical Sciences, with postdoctoral training in vascular pathophysiology at King’s College London from University of London (UK). He holds a Diploma in Teaching from the Pontificia Universidad Católica de Chile (PUC). He is a Fellow of The Physiological Society (UK) (FTPS), a Fellow of the Academy of Physiology of the International Union of Physiological Sciences (FIUPS), member of the Academy of Sciences of Latin-America (ACAL), Professor of Molecular Physiology and Medicine at the Faculty of Medicine at PUC, Honorary Professor at University of Queensland (Australia), Universidad de Sevilla (Spain), and São Paulo State University (UNESP, Brazil), Distinguished Research Professor at TecSalud, Tecnológico de Monterrey (Mexico), and Visiting Professor at the University of Groningen (The Netherlands). He has 243 publications in reputed journals (Google h-index = 54, WoS h-index = 41), and tutored 69 graduate theses and 20 postdoctoral. He is the Director of the Cellular and Molecular Physiology Laboratory (CMPL) at PUC, Executive Editor and member of the editorial board of several scientific/medical journals, IUPS Representative to Americas, member of the Cardiovascular and Respiratory Council Commission of IUPS, member of the Liaison Committee of the Regional Focal Point for Latin America and the Caribbean (RFP LAC) of the International Science Council (ISC), President of the Latin-American Association of Physiological Societies (ALACF) (until 2023), and immediate past-President of the Chilean Society of Physiological Sciences (2021–2023). His research focus is altered fetoplacental vascular function in diseases of pregnancy, including gestational diabesity, gestational diabetes mellitus, preeclampsia, and maternal obesity.

Track 6: Biomedical & Biotechnology Engineering

Thursday, November 2, 9:15AM–10:00AM
Room 272
New Orleans Ernest N. Morial Convention Center

Unraveling Homeostatic Molecular Pathways Involved in Inflammation-Induced Airway Remodeling

Dr. Gary Sieck
Mayo Clinic

Abstract: The effects of inflammation on airway smooth muscle (ASM) are mediated by pro-inflammatory cytokines such as tumor necrosis factor alpha (TNFα) and can be either adaptive (homeostatic) or maladaptive (pathological). In our research, we hypothesize that a homeostatic response to airway inflammation increases mitochondrial O₂ consumption and ATP production to meet increasing energy demands (airway hyper-reactivity), while mitigating oxidative stress. Acute exposure to TNFα increases ASM force generation in response to muscarinic stimulation (hyper-reactivity) resulting in increased ATP consumption and increased tension cost. To meet this increased energetic demand, mitochondrial O₂ consumption and oxidative phosphorylation increase but at the cost of increased reactive oxygen species (ROS) production (oxidative stress). TNFα-induced oxidative stress results in the accumulation of unfolded proteins in the endoplasmic reticulum (ER) of ASM activating an ER stress pathway involving phosphorylation of inositol-requiring enzyme 1 alpha (pIRE1α) triggering downstream alternative splicing of the transcription factor X-box binding protein 1 (sXBP1). We found that activation of the pIRE1α/sXBP1 pathway in human ASM results in mitochondrial fragmentation via phosphorylation of dynamin-related protein-1 (pDrp1S637).
Mitophagy is also activated by TNFα via recruitment of phosphatase and tensin homolog (PTEN)-induced putative kinase 1 (PINK1) to damaged (depolarized) mitochondria and phosphorylation of the Parkin, an E3 ubiquitin ligase that mediates mitophagic removal of damaged mitochondria to improve mitochondrial quality. Exposure to TNFα also results in phosphorylation of cAMP-response element binding protein (pCREB) and activating transcription factor 1 (ATF1) in ASM. ATF1 has a similar sequence to CREB with a homologous phosphorylation domain. In ASM, TNFα induces phosphorylation of ATF1 at serine 63 (pATF1S63) and CREB at serine 133 (pCREBS133), resulting in transcriptional co-activation of the PGC1a promotor with downstream gene targets that mediate mitochondrial DNA replication and mitochondrial biogenesis. As a result, TNFα results in an increase in mitochondrial volume density in ASM cells, reduced O2 consumption rate per mitochondrion, and reduced ROS production, while still meeting increased energy demand. Thus, in the homeostatic response, the energetic load of hyper-reactivity is shared across the mitochondrial pool within ASM cells.

Bio: Gary C. Sieck, Ph.D., is an endowed Professor and Distinguished Investigator and past Chair of the Department of Physiology and Biomedical Engineering at Mayo Clinic. He also served as Dean for Academic Affairs at Mayo. He has mentored 27 Ph.D. students and 87 postdoctoral fellows. He was president of the American Physiological Society and president of the Association of Chairs of Departments of Physiology. He is an elected Fellow of the American Physiological Society and the American Institute of Medical and Biological Engineering. His research focuses on respiratory muscle physiology, specifically cell signaling pathways mediating respiratory muscle plasticity. He has been continuously funded by multiple grants from the NIH for more than 45 years. He has authored 476 journal articles, numerous abstracts, and many other written publications. He was editor-in-chief of the Journal of Applied Physiology and Physiology and is currently an associate editor of Comprehensive Physiology, FASEB BioAdvances, and ASME Journal of Engineering and Science in Medical Diagnostics and Therapy.

Track 7: Dynamics, Vibration, and Control

Monday, October 30, 9:45AM–10:30AM
Room 262
New Orleans Ernest N. Morial Convention Center

Harnessing the Dynamics of Reconfigurable Matter – From Wave Control to Mechano-Intelligence

Dr. Kon-Well Wang
University of Michigan

Abstract: In recent years, the concept of reconfigurable matter developed based on nature-inspired modular architectures has been explored to create advanced engineering systems. For example, inspired by the observation that some of skeletal muscle’s intriguing macroscale functionalities result from the assembly of nanoscale cross-bridge constituents with metastability, the idea of synthesizing metastructures from the integration of mechanical metastable modules has been pursued. In another example, inspired by the physics behind the plant nastic movements and the rich designs of origami folding, a class of metastructures is created building on the innovation of fluidic-origami modular elements. Overall, the modules are designed to be reconfigurable in their shape, mechanical properties, and stability features, so to produce synergistic and intriguing dynamic functionalities at the system level, such as programmable phononic bandgap control and nontraditional wave steering. More recently, with the rapid advances in high-performance intelligent systems, we are witnessing a prominent demand for the next generation of mechanical matter to have much
more built-in intelligence and autonomy. An emerging direction is to pioneer and harness the metastructures’ high dimensionality, multiple stability, and nonlinearity for mechano-intelligence via physical computing. That is, we aim to concurrently embed computing power and functional intelligence, such as observation, learning, memorizing, decision-making, and execution, directly in the mechanical domain, advancing from conventional systems that solely rely on an add-on digital computer to achieve intelligence. This presentation will highlight some of these advancements in harnessing reconfigurable matter for structural dynamics tailoring, from adaptive wave and vibration controls to self-learning–self-tuning intelligence.

Bio: Dr. Kon-Well Wang is the A. Galip Ulsoy Distinguished University Professor of Engineering and Stephen P. Timoshenko Professor of Mechanical Engineering (ME) at the University of Michigan (U-M). He has been the U-M ME Department Chair from 2008 to 2018 and has served as a Division Director at the U.S. National Science Foundation for two years, 2019–2020, via an Executive Intergovernmental Personnel Act appointment. Wang received his Ph.D. degree from the University of California, Berkeley, worked at the General Motors Research Labs as a Sr. Research Engineer, and started his academic career at the Pennsylvania State University in 1988. At Penn State, Wang has served as the William E. Diefenderfer Chaired Professor, co-founder and Associate Director of the Vertical Lift Research Center of Excellence, and a Group Leader for the Center for Acoustics & Vibration. He joined the U-M in 2008. Wang’s main technical interests are in structural dynamics, vibration, and controls, especially in the emerging field of intelligent structural & material systems, with applications in vibration, acoustic & wave controls, energy harvesting, and sensing & monitoring. He has received various recognitions, such as the ASME Rayleigh Lecture Award, the Pi Tau Sigma-ASME Charles Russ Richards Memorial Award, the ASME J.P. Den Hartog Award, the SPIE Smart Structures and Materials Lifetime Achievement Award, the ASME Adaptive Structures and Materials Systems Prize, the ASME N.O. Myklestad Award, the ASME Rudolf Kalman Award, and several other best paper awards. He has been the Editor in Chief for the ASME Journal of Vibration & Acoustics, and an Associate Editor or Editorial Board Member for various journals. Wang is a Fellow of the ASME, AAAS, and IOP.

Track 8: Energy

Thursday, November 2, 9:15AM–10:00AM
Room 273
New Orleans Ernest N. Morial Convention Center

Lithium Ion Batteries for Electric Vehicle

Dr. Wenquan Lu
Argonne National Laboratory

Abstract: Lithium-ion batteries (LIBs) have enabled electric vehicles to become more viable due to their high energy density, long cycle life, low self-discharge rate, and environmental friendliness. However, in order to further facilitate its market penetration, challenges, such as cost, safety, performance, and recycling, still need to be addressed. This presentation will focus on energy density improvement through active material development since they are key components in LIBs. Active materials include both cathode and anode materials, which are equally important to contribute to the energy density of LIBs. As for cathode materials, nickel rich metal oxides as cathode materials will be discussed in terms of their energy density, performance, and stability. On the other hand, Si as anode material will be thoroughly discussed. Two types of Si materials, nano size crystal Si and SiO, were systematically investigated at our laboratory and performance improvements were achieved for both. For Si particles, the improvement was realized by controlling the surface oxide layer, which can mitigate the parasitic reaction between Si and electrolyte. As for SiO, the improvement was realized by regulating the interface between Si and SiO2 domains within the particle.
Bio: Majoring in electrochemical engineering, Dr. Wenquan Lu has over 20 years of work experiences related to renewal energy and energy storage, such as lithium battery, fuel cell, and supercapacitor. His current focus is the lithium-ion battery (LIB) system development for electric vehicle (EV) applications, including fundamental understanding and applied research and development (R&D). As a principal investigator, Dr. Lu has led multiple projects supported by government and industries to advance LIB technologies for EV application. Through close collaboration with multidisciplinary teams and broad research topics, Dr. Lu has developed profound understanding on the LIB system, which allows him to envision the current challenge and future direction of energy storage technology.

The speaker will share his experience spanning over 38 years in teaching and mentoring students to pursue their appropriate roles in the society and in inspiring and grooming those undergraduate students who show interest in pursuing advanced degrees in the Graduate School. Particularly, the recovery experience and resilience of faculty/staff and students in the aftermaths of Hurricanes Katrina (2005), Zeta (2020), and Ida (2021) on the campus of The University of New Orleans will be presented. Finally, the speaker will also share the changes and adjustments of his personal teaching and research philosophy in his career path to fulfill his desire to perform as an inspiring and effective educator.

Bio: Professor Ting Wang is currently the Director of Energy Conversion and Conservation Center (ECCC) and Matthew Endowed Chair for Energy Research at The University of New Orleans (UNO). He is also a Professor in the Department of Mechanical Engineering. Prior to UNO, he taught for 15 years at Clemson University in South Carolina, USA. He has been involved in energy conservation and power generation in full spectrum for the past 40 years. He specializes in gas turbine power generation, turbomachinery, coal gasification, poly-generation, integrated gasification combined cycle (IGCC), Micro Combined Cooling, Heating, and Power (Micro-CCHP), multiphase flow heat transfer, energy efficiency, and general thermal-flow engineering. He has conducted both fundamental and applied research with funding from U.S. governmental agencies, such as Air Force Office of Scientific Research (AFOSR), Office of Naval Research (ONR), U.S. Department of Energy (DOE), USAID, National Science Foundation (NSF), and various private industrial companies. Professor Wang received a Ph.D. from the University of Minnesota at Twin Cities, M.S. degree from the State University of New York at Buffalo, and B.S. from Tatung Institute of Technology in Taiwan with a major in mechanical engineering. He has published over 330 research papers and reports. He was the recipient of the ASME George Westinghouse Silver Medal and Edward F. Obert Award. He was the Past Chair of two ASME committees (Coal, Biomass, Hydrogen, and Alternative Fuels Committee and Gas Turbine Heat Transfer Committee). He has served on the editorial board of three international journals. He currently serves on the Board of Pittsburgh Coal Conference and the Executive Committee of American Society of Thermal and Fluids Engineering (ASTFE). He is an ASME Fellow.
Track 10: Fluids Engineering

Monday, October 30, 9:45AM – 10:30AM
Room 263
New Orleans Ernest N. Morial Convention Center

Numerical and Experimental Investigation of Incipient and Deep Rotating Stall Characteristics in a Mixed-Flow Pump

Dr. Ramesh K. Agarwal
Washington University in St. Louis

Abstract: Pumps are among the most power-consuming general-purpose equipment in energy conversion devices and have significant impact on the modern industrial economy. A mixed flow pump can be considered as a kind of pump design between a centrifugal pump and axial flow pump since it employs the combined effect of centrifugal force and thrust generated by the rotation of the impeller to convey fluid, and the fluid flows axially in and diagonally out through the impeller. It has a high flow rate, high efficiency, and strong anti-cavitation performance. It is widely used for agricultural irrigation, municipal water supply and drainage, water circulation in power industry, naval water jet propulsion, underwater weapons launch, and regional water transfer projects among other applications. Compared to other types of pumps, the internal flow in a mixed-flow pump is more complex, and the secondary flow and deliquescence are more prominent. There are not only inherent unsteady flow problems caused by static and dynamic flow interference, but also unsteady problems induced by wheel edge leakage vortex and its trailing-off in the fluid stream as well as rotational stall and other complex flow phenomena which seriously affect the operational stability, performance, and efficiency of a mixed-flow pump.

In this paper, the internal flow characteristics and the energy performance of a mixed-flow pump in both the incipient and deep stall condition are numerically simulated using RANS equations with several turbulence models (k-ε, k-ω, and SST k-ω). The numerical results are compared with experimental data from an energy performance test and Particle Image Velocimetry (PIV). The analysis of the results shows that the turbulence models have significant influence on predicting the stall characteristics. The important hump zone calculated by the SST k-ω model is more prominent than that obtained by using the k-ε and k-ω models, and the model can better capture the backflow in the end wall region as well as the separated flow and stall vortex compared to the other two models. Additionally, the SST k-ω model has better prediction ability for the uneven spatial distribution of the low pressure area and the change of pressure gradient due to initial stall. Overall, the efficiency of the pump and both the incipient and deep stall flow fields predicted by the SST k-ω model give the best agreement with the experiment. A validated computational tool is then used for robust optimization of impeller blades using machine learning (Neural Network) to improve the pump efficiency for a wide range of flow rates. This technology/approach can be used for robust optimization of other pump types.

Bio: Professor Ramesh K. Agarwal is the William Palm Professor of Engineering in the Department of Mechanical Engineering and Materials Science at Washington University in St. Louis. From 1994 to 2001, he was the Sam Bloomfield Distinguished Professor and Executive Director of the National Institute for Aviation Research at Wichita State University in Kansas. From 1978 to 1994, he was the Program Director and McDonnell Douglas Fellow at McDonnell Douglas Research Laboratories in St. Louis. Dr. Agarwal received Ph.D. in Aeronautical Sciences from Stanford University in 1975, M.S. in Aeronautical Engineering from the University of Minnesota in 1969, and B.S. in Mechanical Engineering from Indian Institute of Technology, Kharagpur, India in 1968. Over a period of 45 years, he has worked in several disciplines within mechanical and aerospace engineering, and energy and environment, which include computational fluid dynamics, computational electromagnetics and acoustics, control theory, multidisciplinary design and optimization, turbomachinery and pumps, chemical looping combustion,
carbon capture and sequestration, and wind energy. He is the author and coauthor of over 600 publications. He has given many plenary, keynote, and invited lectures at various national and international conferences worldwide in over sixty countries. He is a Fellow of 28 professional societies, including American Institute of Aeronautics and Astronautics (AIAA), American Society of Mechanical Engineers (ASME), Institute of Electrical and Electronics Engineers (IEEE), Society of Automotive Engineers (SAE), American Association for Advancement of Science (AAAS), American Physical Society (APS), and American Society for Engineering Education (ASEE). He has received many prestigious honors and national/international awards from various professional societies and organizations for his research contributions, including the AIAA Reeds Aeronautics Award, SAE Medal of Honor, ASME Honorary Membership, and Honorary Fellowship from Royal Aeronautical Society.

Track 11: Heat Transfer and Thermal Engineering

**Wednesday, November 1, 9:45AM–10:30AM**
**Room 272**
**New Orleans Ernest N. Morial Convention Center**

**Verification, Validation, and Uncertainty Quantification (VVUQ) – A Guide to Practical Implementation**

**Dr. Chris Freitas**
_Southwest Research Institute_

**Abstract:** Verification, Validation, and Uncertainty Quantification (VVUQ) in computational modeling and simulation in science and engineering requires additional work elements to be executed in a computational workflow. Typically, a computational workflow or series of simulations are performed to provide data in support of an engineering or science project where there is a purpose and technical objective for the project. These projects have schedule and cost requirements. VVUQ is essential to the successful outcomes of these projects, where VVUQ provides the supporting data for assessing the predictive accuracy of the computational simulations. However, there is a cost and schedule impact of VVUQ to these technical projects; thus, knowing when enough VVUQ is enough becomes a critical metric. Anticipating the requirements for VVUQ is an important step in project planning. This presentation provides background and insights into how to balance project requirements with VVUQ.

**Bio:** Dr. Christopher J. Freitas is Program Director for Computational and Experimental Mechanics, in the Department of Engineering Dynamics at Southwest Research Institute (SWRI) and has over 35 years of experience in R&D. Dr. Freitas is a mechanical engineer with professional interests in modeling and simulation, experimental methods, high-performance computing and software development, and continuum mechanics. He holds a B.S. degree (1977) in Environmental & Ocean Engineering from Humboldt State University (a California State University), an M.S. degree (1978) in Civil Engineering from Utah State University (Fluid Mechanics/Hydraulics/Hydrology), and a Ph.D. (1986) in Mechanical & Civil Engineering from Stanford University (Computational Fluid Dynamics). Dr. Freitas develops and applies computational tools and experimental methods for the analysis of complex engineered and naturally occurring systems. He develops research projects that couple together modeling and simulation with large scale experiments and has worked extensively on verification, validation, and uncertainty analysis. Dr. Freitas has written or collaborated on numerous technical papers/presentations (150+) and technical reports (200+) and holds six patents. He is a registered professional engineer in California. He has served ASME in many roles and is currently the Editor-in-Chief of ASME’s _Journal of Verification, Validation and Uncertainty Quantification_. Dr. Freitas is an ASME Fellow, winner of the ASME Fluids Engineering Division Medal, ASME Dedicated Service Award, and the ASME Patrick J. Higgins Medal.
Track 12: Mechanics of Solids, Structures, and Fluids

Tuesday, October 31, 9:15AM–10:00AM
Room 271
New Orleans Ernest N. Morial Convention Center

Isogeometric Analysis: Breakthroughs in Computational Mechanics of Shell Structures

Yuri Bazilevs
Brown University

Abstract: Designers generate CAD (Computer Aided Design) models, which are then translated into geometries that are suitable for physics-based simulation. These geometries are meshed and then serve as inputs to Finite Element Analysis (FEA) simulation codes. The geometry conversion process is often tedious and manual-labor intensive and is estimated to take the bulk overall analysis time. Isogeometric Analysis (IGA), which is a collection of geometrically exact discretization methods for Partial Differential Equations (PDEs), is aimed at the unification of CAD and engineering simulation by eliminating the main bottlenecks in the engineering design-through-analysis process and product development cycle. The fundamental idea of IGA is to focus on a single geometric model, which can be utilized directly as a simulation model, or from which geometrically precise analysis models can be efficiently built. Integration of CAD and FEA is thus achieved by developing general-purpose computational analysis framework and procedures based on the technologies of CAD and CG. While IGA has significantly impacted much of computational mechanics, one area that has benefited the most from IGA research is computational methods for shell structures. Because geometrically complex, smooth surfaces are naturally represented in CAD systems, much of that technology could be directly employed in the discretization of existing shell theories, with increased accuracy and robustness in general-purpose nonlinear applications relative to traditional FEA representations. In addition, the increased smoothness of CAD surface representation (by means of B-Splines and their rational and unstructured variants) enabled the formulation, and use in general-purpose nonlinear applications, of thin shell theories previously unattainable in traditional FEA. Many more developments followed, making shells the most mature IGA technology today and a prime candidate for implementation in commercial FEA codes. This presentation will focus on key breakthroughs in IGA for thin structures, starting from early developments and progressing to recent research results. Several applications will be presented where Isogeometric shells are playing a key role in the success of the computations performed.

Bio: Yuri Bazilevs is the E. Paul Sorensen Professor in the School of Engineering at Brown University. His research interests are in computational science and engineering, with emphasis on the modeling and simulation in solids and structures, fluids, and their coupling in HPC environments. For his research contributions Yuri received many awards and honors, including the 2018 Walter E. Huber Research Prize from the ASCE, the 2020 Gustus L. Larson Award from the ASME, and the Computational Mechanics Award from the International Association for Computational Mechanics (IACM). He is included in the lists of Highly Cited Researchers, both in the Engineering (2015–2018) and Computer Science (2014–2019) categories. Yuri recently completed his service as the President of the U.S. Association for Computational Mechanics (USACM) and as the Chairman of the Applied Mechanics Division of the ASME. He currently serves on the U.S. National Committee for Theoretical and Applied Mechanics (USNCTAM).
Track 12: Mechanics of Solids, Structures and Fluids

Monday, October 30, 9:45AM – 10:30AM
Room 271
New Orleans Ernest N. Morial Convention Center

Computational Flow Analysis with Boundary Layer and Contact Representation: Car and Tire Aerodynamics with Road Contact

Tayfun Tezduyar
Waseda University

Abstract: In computational flow analysis with moving solid surfaces and contact between the solid surfaces, it is a challenge to represent the boundary layers with an accuracy attributed to moving-mesh methods and represent the contact without leaving a mesh protection gap. The Space-Time Topology Change (ST-TC) method, introduced in 2013, makes moving-mesh computation possible even when we have contact between moving solid surfaces or other kinds of flow-domain topology change. The contact is represented without giving up on high-resolution flow representation near the moving surfaces. With the ST-TC and other ST computational methods introduced before and after, it has been possible to address many of the challenges encountered in conducting this class of flow analysis in the presence of additional complexities such as geometric complexity, rotation or deformation of the solid surfaces, and multiscale nature of the flow. We provide an overview of the methods that made all that possible. We also provide an overview of the computations performed for tire aerodynamics with challenges that include the influence of the car aerodynamics, complexity of a near-actual tire geometry with grooves, road contact, tire deformation and rotation, road roughness, and fluid films.

Track 13: Micro- and Nano-Systems Engineering and Packaging

Tuesday, October 31, 9:15AM – 10:00AM
Room 272
New Orleans Ernest N. Morial Convention Center

**Integrated Microfluidic Systems for the Comprehensive Analysis of Circulating Tumor Cells and Circulating Leukemia Cells**

Dr. Steven Soper
University of Kansas

Abstract: Liquid biopsies are becoming popular for managing cancer diseases due to the minimally invasive nature of their acquisition. Circulating tumor cells (CTCs) generated from solid tumors and circulating leukemia cells (CLCs) produced from liquid cancers, are biomarkers that can be secured from blood using microfluidic technologies. However, many of these platforms require manual sample handling, which can generate difficulties when translating CTC/CLC assays into the clinic due to potential sample loss, contamination, and the need for highly specialized operators. In this presentation, we will discuss a system modularity chip for the analysis of rare targets (SMART-Chip) comprised of three task-specific modules that can fully automate processing of CTCs and CLCs. The modules are used for affinity selection of CTCs/CLCs from blood with subsequent photorelease (catch and release), simultaneous counting and viability determinations of the selected/released cells, and staining/imaging of the cells for immunophenotyping as well as looking for chromosomal abnormalities (FISH). The modules were interconnected to a fluidic motherboard populated with valves, interconnects, pneumatic control channels, and a fluidic network. The SMART-Chip components were made from thermoplastics via micro-replication, which significantly lowered the cost of
production making it amenable for clinical implementation. The utility of the SMART-Chip was demonstrated by processing blood samples secured from colorectal cancer patients. We were able to affinity select EpCAM expressing CTCs with high purity (0-3 WBC contaminants/mL of blood), enumerate the selected cells, determine their viability, and immunophenotype them. In the case of CLCs, CD19-expressing B-cells were selected from pediatric patients suffering from acute lymphoblastic leukemia to determined disease recurrence from minimum residual disease. The assays could be completed in <4 h using the SMART-Chip, while manual processing required >8 h.

Bio: Prof. Soper is a Foundation Distinguished Professor in Chemistry and Mechanical Engineering at the University of Kansas. At KUMC, Prof. Soper holds an adjunct appointment in the Cancer Biology Department and is a member of the KU Cancer Center. Prof. Soper has secured extramural funding totaling >$135M, has published over 245 peer-reviewed manuscripts (h index = 70; >17,000 citations); 31 book chapters and 71 peer-reviewed conference proceeding papers, and is the author of 12 patents. He is also the founder of a startup company, BioFluidica, which is marketing devices for the isolation and enumeration of liquid biopsy markers. Soper recently founded a second company, Sunflower Genomics, which is seeking to market a new DNA/RNA single-molecule sequencing platform. His list of awards includes Ralph Adams Award in Bioanalytical Chemistry, Chemical Instrumentation by the American Chemical Society, the Benedetti-Pichler Award for Microchemistry, Fellow of the AAAS, Fellow of Applied Spectroscopy, Fellow of the Royal Society of Chemistry, R&D 100 Award, Distinguished Masters Award at LSU, and Outstanding Scientist/Engineer in the state of Louisiana in 2001. Finally, Prof. Soper has granted 50 PhDs and 7 MS degrees to students under his mentorship. He currently heads a group of 15 researchers.

Track 13: Micro- and Nano-Systems Engineering and Packaging

**Monday, October 30, 9:45AM – 10:30AM**
**Room 272**
**New Orleans Ernest N. Morial Convention Center**

**MEMS and Microsystems for Space Environment**

**Dr. Mina Rais-Zadeh**
**NASA**

**Abstract:** Extreme environments seen in Space pose challenges for current technologies. Both extreme temperature, temperature swings, and high radiation place great demands on instrumentation, and deployment in these environments requires additional mass and power to maintain operational conditions. As the cost of the mission is directly related to the size and weight of the instrument, there is a great demand for low size, weight, and power (SWaP) harsh environment tolerant instruments for space applications. III-N materials are more robust than Si in these environments. Wide bandgaps allow electronic functionality to higher temperatures, and greater bond strengths result in robustness to radiation displacement damage as well as reduced degradation in reactive environments. These superior properties in demanding environments relax requirements on protection, freeing more mass and power for instruments (or allowing mass/power reduction for the spacecraft). In this talk, I will present harsh environment tolerant devices and microsystems based on III-V materials that we have developed for various planetary missions.
Bio: Mina Rais-Zadeh received the B.S. degree in electrical engineering from Sharif University of Technology and M.S. and Ph.D. degrees both in Electrical and Computer Engineering from Georgia Institute of Technology in 2005 and 2008, respectively. From 2008 to 2009, she was a Postdoctoral Research Fellow at Georgia Institute of Technology. In 2009, she joined the University of Michigan, Ann Arbor, as an Assistant Professor of Electrical Engineering and Computer Science (EECS). From 2014 to 2018, she had been a tenured Associate Professor in EECS with a courtesy appointment in the Department of Mechanical Engineering. She is currently leading the MEMS and micro-instrument development activity at the Jet Propulsion Laboratory as a group supervisor for the Advanced Micro-sensors and Microsystems Group.

Track 14: Safety Engineering, Risk and Reliability Analysis

Wednesday, November 1
9:45AM – 10:30AM
Room 273
New Orleans Ernest N. Morial Convention Center

Dr. Mihan H. McKenna Taylor
Mississippi State University

Abstract: Engineer Intelligence is engineering information which has been evaluated as to its accuracy and reliability and accepted as fact, related to specific activities, and used to plan operations or construction activities. Though generally understood to be discrete analyses tied to a specific time and place, in reality, the status of the physical environment is under constant flux due to human activity and the effects of weather and other natural disasters. This constant flow of changes drives the requirement for engineer intelligence to be continually updated and reassessed and necessitates rephrasing this concept to Persistent Engineer Intelligence. As such, Engineer Intelligence Systems become the combination of environmental data sets, analyzed information, assessments, planning tools, and programs, all of which is used to support the breadth of engineer operations. Many activities in the civilian realm have equivalents to military tasks and the era of real-time data from smart infrastructure positions the civilian infrastructure owner at the forefront of implementation of persistent engineer intelligence for civilian infrastructure systems. This presentation will explain the history of the Army Engineer, the concept of Persistent Engineer Intelligence, analogues between civilian and military roles, and the critical role that Big Data will play in all future engineer tasks.
Biography: Recipient of the 2013 USACE Researcher of the Year award for innovative remote monitoring of structures, Dr. McKenna Taylor specializes in bringing reality to intelligent decision making. She leads multi-disciplinary near-surface phenomenology research to create adaptive, effective, and revolutionary tools and scientific programs to shape future operational environments, including terrain shaping and near-surface persistent surveillance. More: Using geophysics and geotechnical engineering to proactively manipulate and assess the near-surface interface, she executes and fosters research to meet multi-domain threat assessment and maneuver goals, through high-performance computing simulations, analytical analysis, and laboratory and field experimentation, with applications for both civil and military end-users across multiple Department of Defense (DoD), federal, intelligence and academic communities. Dr. McKenna Taylor is the Co-Chair of the National System for Geospatial Intelligence (NSG) Artificial Intelligence, Automation, Augmentation Working Group, (AAA WG) and serves as the Basic Research 6.1 Advisor for the ERDC Adaptive Protection, Maneuver, Geospatial, and Natural Sciences Research Portfolio. Dr. McKenna Taylor is the author of numerous journal articles, technical reports, and other publications on a wide variety of geophysical and geotechnical topics. Dr. McKenna Taylor holds a B.S. in Physics with a Chemistry minor from Georgetown University (1999) and a Ph.D. in Geophysics from Southern Methodist University (2005). She is a Certified Professional Geologist (#11410) from The American Institute of Professional Geologists (AIPG) and a Registered Professional Geologist in the state of Alaska (#661). Dr. McKenna is actively involved in the Military Sensing Symposiums (Battlefield Acoustics, Magnetic, and Seismic/Electromagnetics), as well as the American Geophysical Union and the Acoustical Society of America. Prior to joining ERDC in 2005, and while pursuing her Ph.D, Dr. McKenna Taylor taught Geophysics and Geology at Southern Methodist University (SMU) in Dallas, Texas (1999-2005), and conducted research in support of the Comprehensive Nuclear Test Ban Treaty. She is currently an adjunct professor in the Huffington Department of Geological Sciences at SMU and the Civil and Environmental Engineering Department of Mississippi State University.

Track 14: Safety Engineering, Risk and Reliability Analysis

Tuesday, October 31
9:15AM – 10:00AM
Room 273
New Orleans Ernest N. Morial Convention Center

A Unified Approach for Analysis of Machinery Degradation

Dr. Michael Khonsari
Louisiana State University

Abstract: Engineers are constantly confronted with the challenging problem of dealing with material degradation and predicting the remaining useful life of machines. Material degradation can be in the form of wear, fatigue, fretting, corrosion, erosion, creep, etc. These dissipative processes involve a variety of complex and physically diverse phenomena that often occur in an inextricably intertwined fashion. Although often treated as separate phenomena, they are a manifestation of the same physics associated with material degradation that causes disorder. Therefore, notwithstanding the multiplicity of underlying dissipative processes involved, they all share one unique feature: they all produce entropy. Therefore, thermodynamic entropy production is believed to be a useful measure for assessing material degradation. In this talk, I present the results of a series of recent experimental and analytical developments associated with surface degradation, such as wear and fatigue fracture within the framework of irreversible thermodynamics. This view offers a potentially useful path forward for developing predictive methodologies for various applications.
Bio: Michael Khonsari earned his B.S., M.S., and Ph.D. in Mechanical Engineering from The University of Texas at Austin. He holds the Dow Chemical Endowed Chair and is Professor of Mechanical Engineering at Louisiana State University (LSU). Before joining LSU, he was a faculty member at The Ohio State University, University of Pittsburgh, and Southern Illinois University. Professor Khonsari has authored three technical books in tribology, fatigue, and rotor dynamics and over 440 archival papers, including book chapters and special publications. He is the recipient of several research awards, including the ASME Mayo Hersey Award, Burt Newkirk Award, the STLE Presidential Award, and ALCOA awards for his contributions to tribology. He is the director of NSF Center for Innovations in Structural Integrity Assurance (CISIA), a university-industry-government cooperative center. Professor Khonsari is a fellow of ASME, The Society of Tribologists and Lubrication Engineers (STLE), the American Association for the Advancement of Science (AAAS), and the National Academy of Inventors (NAI).
Program-at-a-Glance
<table>
<thead>
<tr>
<th>Room</th>
<th>PG</th>
<th>Monday, October 30</th>
</tr>
</thead>
<tbody>
<tr>
<td>261</td>
<td>86</td>
<td>10:45am–12:30pm</td>
</tr>
<tr>
<td>262</td>
<td>87</td>
<td>03-04-01: Advanced Machining and Finishing Processes (Technical Session)</td>
</tr>
<tr>
<td>263</td>
<td>143</td>
<td>05-04-01: Advances in Aerospace Structures and Materials (Technical Session)</td>
</tr>
<tr>
<td>264</td>
<td>176</td>
<td>07-01-01: General Dynamics, Vibration, and Control (Technical Session)</td>
</tr>
<tr>
<td>265</td>
<td>177</td>
<td>07-02-01: Nonlinear Dynamics, Control, and Stochastic Mechanics (Technical Session)</td>
</tr>
<tr>
<td>266</td>
<td>178</td>
<td>07-06-01: Smart Structures and Strutronic Systems: Sensing, Energy Generation and Control (Technical Session)</td>
</tr>
<tr>
<td>267</td>
<td>225</td>
<td>09-01-01: Curriculum Innovations, Pedagogy and Learning Methodologies - I (Technical Session)</td>
</tr>
<tr>
<td>269</td>
<td>235</td>
<td>10-02-01: CFD Applications for Optimization and Controls (Technical Session)</td>
</tr>
<tr>
<td>270</td>
<td>236</td>
<td>10-04-01: Fluid Measurements and Instrumentation (Technical Session)</td>
</tr>
<tr>
<td>271</td>
<td>237</td>
<td>10-07-01: Fluid Mechanics and Rheology of Nonlinear Materials and Complex Fluids (Technical Session)</td>
</tr>
<tr>
<td>273</td>
<td>253</td>
<td>11-45-01: Technique development for thermophysical characterization (Technical Session)</td>
</tr>
<tr>
<td>274</td>
<td>277</td>
<td>12-03-01: Data-Enabled Predictive Modeling, Scientific Machine Learning, and Uncertainty Quantification in Computational Mechanics (Technical Session)</td>
</tr>
</tbody>
</table>
### Monday, October 30

<table>
<thead>
<tr>
<th>Room</th>
<th>PG</th>
<th>Time</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>290</td>
<td>178</td>
<td>07-03-01: Design and Control of Robots, Mechanisms and Structures I (Technical Session)</td>
<td>07-03-02: Design and Control of Robots, Mechanisms and Structures II (Technical Session)</td>
</tr>
<tr>
<td>291</td>
<td>116</td>
<td>04-08-01: Design of engineered materials and components for additive manufacturing (Technical Session)</td>
<td>03-16-01: Manufacturing: General (Technical Session)</td>
</tr>
<tr>
<td>292</td>
<td>144</td>
<td>05-11-01: Advances in Mechanics, Multiscale Models and Experimental Techniques for Composites (Technical Session)</td>
<td>05-12-01: Peridynamics Modeling (Technical Session)</td>
</tr>
</tbody>
</table>

### Tuesday, October 31

<table>
<thead>
<tr>
<th>Room</th>
<th>PG</th>
<th>Time</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>262</td>
<td>91</td>
<td>03-08-01: Computational Modeling and Simulation for Advanced Manufacturing (Technical Session)</td>
<td>03-08-02: Computational Modeling and Simulation for Advanced Manufacturing (Technical Session)</td>
</tr>
<tr>
<td>264</td>
<td>148</td>
<td>05-08-01: Dynamics and Control of Aerospace Structures (Technical Session)</td>
<td>05-16-01: Applications of Artificial Intelligence/Machine Learning in Aerospace Engineering (Technical Session)</td>
</tr>
<tr>
<td>Time</td>
<td>Session ID</td>
<td>Session Title</td>
<td>Session ID</td>
</tr>
<tr>
<td>-------</td>
<td>------------</td>
<td>-------------------------------------------------------------------------------</td>
<td>------------</td>
</tr>
<tr>
<td>05-07-01</td>
<td>265</td>
<td>Advanced Manufacturing and Mechanical Behavior of Composites (Technical Session)</td>
<td>148</td>
</tr>
<tr>
<td>06-02-01</td>
<td>155</td>
<td>Vibration and Acoustics in Biomedical Applications (Technical Session)</td>
<td>07-10-01: Mobile Robots and Unmanned Ground Vehicles (Technical Session)</td>
</tr>
<tr>
<td>06-03-01</td>
<td>157</td>
<td>Biomedical Imaging, Therapy and Tissue Characterization (Technical Session)</td>
<td>07-10-03: Mobile Robots and Unmanned Ground Vehicles (Technical Session)</td>
</tr>
<tr>
<td>06-01-01</td>
<td>266</td>
<td>Injury and Damage Biomechanics - Traumatic Brain Injury and Head Impact Studies (Technical Session)</td>
<td>154</td>
</tr>
<tr>
<td>06-01-02</td>
<td>156</td>
<td>Experimental and Computational Approaches in Brain Injury Research (Technical Session)</td>
<td>157</td>
</tr>
<tr>
<td>06-01-03</td>
<td>158</td>
<td>Biomechanics - Biomechanics and Modeling of Neural and Musculoskeletal Systems (Technical Session)</td>
<td>159</td>
</tr>
<tr>
<td>07-11-01</td>
<td>267</td>
<td>General Dynamics, Vibration, and Control (Technical Session)</td>
<td>189</td>
</tr>
<tr>
<td>07-12-01</td>
<td>192</td>
<td>Optimization, Uncertainty and Probability (Technical Session)</td>
<td>07-12-01: Optimization, Uncertainty and Probability (Technical Session)</td>
</tr>
<tr>
<td>07-13-01</td>
<td>268</td>
<td>Control Theory and Applications (Technical Session)</td>
<td>189</td>
</tr>
<tr>
<td>07-14-01</td>
<td>192</td>
<td>Fluid-Structure Interaction (Technical Session)</td>
<td>07-12-01: Optimization, Uncertainty and Probability (Technical Session)</td>
</tr>
<tr>
<td>07-15-01</td>
<td>269</td>
<td>Mobile Robots and Unmanned Ground Vehicles (Technical Session)</td>
<td>191</td>
</tr>
<tr>
<td>07-16-01</td>
<td>193</td>
<td>Mobile Robots and Unmanned Ground Vehicles (Technical Session)</td>
<td>07-10-01: Mobile Robots and Unmanned Ground Vehicles (Technical Session)</td>
</tr>
<tr>
<td>08-10-03</td>
<td>208</td>
<td>Multi-Energy Systems (Technical Session)</td>
<td>08-10-03: Multifunctional energy storages (Technical Session)</td>
</tr>
<tr>
<td>08-11-01</td>
<td>271</td>
<td>Electric vehicle batteries as multifunctional energy storages (Technical Session)</td>
<td>209</td>
</tr>
<tr>
<td>09-01-03</td>
<td>272</td>
<td>Curriculum Innovations, Pedagogy and Learning Methodologies - III (Technical Session)</td>
<td>230</td>
</tr>
<tr>
<td>09-01-04</td>
<td>232</td>
<td>IV (Technical Session)</td>
<td>09-11-01: K-12 Outreach and Engineering Innovation (Technical Session)</td>
</tr>
<tr>
<td>09-08-01</td>
<td>273</td>
<td>Distance/Online Engineering Education, Models and Enabling Technologies (Technical Session)</td>
<td>230</td>
</tr>
<tr>
<td>10-05-02</td>
<td>244</td>
<td>29th Symposium on Fundamental Issues and Perspectives in Fluid Mechanics - II (Technical Session)</td>
<td>244</td>
</tr>
<tr>
<td>10-13-01</td>
<td>151</td>
<td>Graduate Student Scholar (GSS) Competition (Technical Session)</td>
<td>05-16-02: Applications of Artificial Intelligence/Machine Learning in Aerospace Engineering (Technical Session)</td>
</tr>
<tr>
<td>11-02-01</td>
<td>262</td>
<td>Oscillating Heat Pipes and Thermosiphons (Technical Session)</td>
<td>11-20-01: Gas Turbine and Enhanced Heat Transfer (Technical Session)</td>
</tr>
<tr>
<td>11-07-01</td>
<td>277</td>
<td>Phase Change Heat Transfer (Technical Session)</td>
<td>263</td>
</tr>
<tr>
<td>11-08-01</td>
<td>263</td>
<td>Fundamentals of Boiling/Condensation including Micro/Nano-scale effects (Technical Session)</td>
<td>267</td>
</tr>
</tbody>
</table>

**Tuesday, October 31**
<table>
<thead>
<tr>
<th>Room</th>
<th>PG</th>
<th>Time</th>
<th>Session</th>
</tr>
</thead>
<tbody>
<tr>
<td>280</td>
<td>302</td>
<td>10:45am–12:30pm</td>
<td>13-04-01: Applications of Micro and Nano Systems in Medicine and Biology I (Technical Session)</td>
</tr>
<tr>
<td>288</td>
<td>303</td>
<td>10:45am–12:30pm</td>
<td>13-05-01: Micro and Nano Devices (Technical Session)</td>
</tr>
<tr>
<td>289</td>
<td>309</td>
<td>10:45am–12:30pm</td>
<td>14-02-02: Reliability and Risk in Energy Systems (Technical Session)</td>
</tr>
<tr>
<td>290</td>
<td>189</td>
<td>10:45am–12:30pm</td>
<td>07-03-04: Design and Control of Robots, Mechanisms and Structures IV (Technical Session)</td>
</tr>
<tr>
<td>291</td>
<td>120</td>
<td>10:45am–12:30pm</td>
<td>04-05-01: Materials Processing and Characterization (Technical Session)</td>
</tr>
</tbody>
</table>

**Program at a Glance**

**Tuesday, October 31**

<table>
<thead>
<tr>
<th>Room</th>
<th>PG</th>
<th>Time</th>
<th>Session</th>
</tr>
</thead>
<tbody>
<tr>
<td>280</td>
<td>302</td>
<td>2:00pm–3:45pm</td>
<td>13-04-02: Applications of Micro and Nano Systems in Medicine and Biology II (Technical Session)</td>
</tr>
<tr>
<td>288</td>
<td>303</td>
<td>2:00pm–3:45pm</td>
<td>13-03-01: Computational Studies on MEMS and Nanostructures (Technical Session)</td>
</tr>
<tr>
<td>289</td>
<td>309</td>
<td>2:00pm–3:45pm</td>
<td>14-04-01: Machine Learning for Safety, Reliability, and Maintenance (Technical Session)</td>
</tr>
<tr>
<td>290</td>
<td>189</td>
<td>2:00pm–3:45pm</td>
<td>05-06-01: Lightweight Sandwich Composites and Layered Structures (Technical Session)</td>
</tr>
<tr>
<td>291</td>
<td>120</td>
<td>2:00pm–3:45pm</td>
<td>04-05-02: Materials Processing and Characterization (Technical Session)</td>
</tr>
</tbody>
</table>

**Wednesday, November 1**

<table>
<thead>
<tr>
<th>Room</th>
<th>PG</th>
<th>Time</th>
<th>Session</th>
</tr>
</thead>
<tbody>
<tr>
<td>261</td>
<td>67</td>
<td>01-08-01: Flow-Induced Noise and Vibration (Technical Session)</td>
<td></td>
</tr>
<tr>
<td>262</td>
<td>68</td>
<td>01-06-01 Dynamics of Adaptive Engineering Structures and Material (Technical Session)</td>
<td></td>
</tr>
<tr>
<td>263</td>
<td>69</td>
<td>01-04-02: Phononics - Fundamental Studies (Technical Session)</td>
<td></td>
</tr>
<tr>
<td>264</td>
<td>78</td>
<td>02-02-01: Design, Modeling and Systems (Technical Session)</td>
<td></td>
</tr>
<tr>
<td>265</td>
<td>97</td>
<td>03-05-04: 8th Symposium on Fastening and Joining Research and Advanced Technology (Technical Session)</td>
<td></td>
</tr>
<tr>
<td>267</td>
<td>126</td>
<td>04-05-05: Materials Processing and Characterization (Technical Session)</td>
<td></td>
</tr>
<tr>
<td>268</td>
<td>127</td>
<td>04-04-01: Additive Manufacturing and 3D Printing (Technical Session)</td>
<td></td>
</tr>
</tbody>
</table>

**Room PG 265**

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
</tr>
</thead>
<tbody>
<tr>
<td>10:45am–12:30pm</td>
<td>03-01-04: 7th Annual Conference-Wide Symposium on Additive Manufacturing: Applications (Technical Session)</td>
</tr>
<tr>
<td>2:00pm–3:45pm</td>
<td>03-02-01: Congress-Wide Symposium on NDE &amp; SHM: Measurement Science, Sensors, and Process Monitoring and Control for Advanced Manufacturing (Technical Session)</td>
</tr>
<tr>
<td>4:00pm–5:45pm</td>
<td>03-09-01: Variation Simulation and Design for Assembly (Technical Session)</td>
</tr>
</tbody>
</table>

**Room PG 266**

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
</tr>
</thead>
<tbody>
<tr>
<td>10:45am–12:30pm</td>
<td>03-03-01: Nanomanufacturing: Novel Processes, Applications, and Process-Property Relationships (Technical Session)</td>
</tr>
<tr>
<td>2:00pm–3:45pm</td>
<td>04-05-05: Materials Processing and Characterization (Technical Session)</td>
</tr>
<tr>
<td>4:00pm–5:45pm</td>
<td>04-04-01: Additive Manufacturing and 3D Printing (Technical Session)</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>269</td>
<td>126</td>
</tr>
<tr>
<td>270</td>
<td>159</td>
</tr>
<tr>
<td>271</td>
<td>159</td>
</tr>
<tr>
<td>272</td>
<td>194</td>
</tr>
<tr>
<td>273</td>
<td>195</td>
</tr>
<tr>
<td>274</td>
<td>210</td>
</tr>
<tr>
<td>275</td>
<td>210</td>
</tr>
<tr>
<td>276</td>
<td>245</td>
</tr>
<tr>
<td>277</td>
<td>245</td>
</tr>
<tr>
<td>278</td>
<td>264</td>
</tr>
<tr>
<td>279</td>
<td>265</td>
</tr>
<tr>
<td>280</td>
<td></td>
</tr>
<tr>
<td>289</td>
<td>211</td>
</tr>
</tbody>
</table>
**Wednesday, November 1**

<table>
<thead>
<tr>
<th>Room</th>
<th>PG</th>
<th>Time</th>
<th>Session Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>291</td>
<td>99</td>
<td>03-12-01: Digital Manufacturing Process Simulation and Validation (Technical Session)</td>
<td>102</td>
</tr>
<tr>
<td>292</td>
<td>160</td>
<td>06-12-01: Robotics, Rehabilitation (Technical Session)</td>
<td>162</td>
</tr>
<tr>
<td>298</td>
<td>69</td>
<td>01-13-01 Acoustics and Vibrations: AI, ML and Acoustic Sensors and Devices (Technical Session)</td>
<td>71</td>
</tr>
</tbody>
</table>

**Thursday, November 2**

<table>
<thead>
<tr>
<th>Room</th>
<th>PG</th>
<th>Time</th>
<th>Session Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>261</td>
<td>73</td>
<td>10:15am–12:00pm</td>
<td>01-04-03: Phononic: Topological Phononics (Technical Session)</td>
</tr>
<tr>
<td>262</td>
<td>73</td>
<td>01-01-01 New Advances in Acoustics and Vibrations (Technical Session)</td>
<td>75</td>
</tr>
<tr>
<td>263</td>
<td>81</td>
<td>02-01-02: Product and Process Design (Technical Session)</td>
<td>82</td>
</tr>
<tr>
<td>265</td>
<td>106</td>
<td>03-11-01: Laser-Based Advanced Manufacturing and Materials Processing (Technical Session)</td>
<td>108</td>
</tr>
<tr>
<td>266</td>
<td>105</td>
<td>03-10-01: Robotics and Automation in Advanced Manufacturing (Technical Session)</td>
<td>108</td>
</tr>
<tr>
<td>Time</td>
<td>Session Code</td>
<td>Title</td>
<td>Location</td>
</tr>
<tr>
<td>-------</td>
<td>--------------</td>
<td>----------------------------------------------------------------------</td>
<td>------------</td>
</tr>
<tr>
<td>270</td>
<td>166</td>
<td>06-05-02: Biomedical Devices (Technical Session)</td>
<td>169</td>
</tr>
<tr>
<td>271</td>
<td>166</td>
<td>06-06-01: Dynamics and Control of Biomechanical Systems (Technical Session)</td>
<td>170</td>
</tr>
<tr>
<td>272</td>
<td>167</td>
<td>06-09-01: Computational Modeling in Biomedical Applications - I (Technical Session)</td>
<td>171</td>
</tr>
<tr>
<td>273</td>
<td>219</td>
<td>08-18-01: Sustainable Buildings and Communities (Technical Session)</td>
<td>221</td>
</tr>
<tr>
<td>275</td>
<td>222</td>
<td>08-08-03: Design Analysis and Optimization of Energy Conversion Systems - 3 (Technical Session)</td>
<td>224</td>
</tr>
<tr>
<td>276</td>
<td>220</td>
<td>08-08-02: Design Analysis and Optimization of Energy Conversion Systems - 2 (Technical Session)</td>
<td>272</td>
</tr>
<tr>
<td>277</td>
<td>269</td>
<td>11-16-01: Boiling and Condensation (Technical Session)</td>
<td>271</td>
</tr>
<tr>
<td>278</td>
<td>269</td>
<td>11-59-01: First Principles and Molecular Dynamics Simulations of Thermal Transport in Solids (Technical Session)</td>
<td>271</td>
</tr>
<tr>
<td>280</td>
<td>295</td>
<td>12-11-01: Fatigue and fracture evaluation and quantification for failure analysis (Technical Session)</td>
<td>295</td>
</tr>
<tr>
<td>289</td>
<td>107</td>
<td>03-16-02: Manufacturing: General (Technical Session)</td>
<td>291</td>
</tr>
<tr>
<td>290</td>
<td>135</td>
<td>04-21-01: Printed Hybrid Multifunctional Electronics and Energy Devices (Technical Session)</td>
<td>137</td>
</tr>
</tbody>
</table>
**Track 1: Acoustics, Vibration, and Phononics**  
Sponsored by Noise Control and Acoustics Division

**Topics:**

1-1: General
1-2: Passive, Semi-Active, and Active Noise and Vibration Control
1-3: Analytical and Computational Acoustics and Vibrations
1-4: Phononic Crystals and Metamaterials
1-5: Wave Propagation in Heterogenous and Architectured Media
1-6: Dynamics of Adaptive Engineering Structures and Materials
1-7: Aero-acoustics and Sound Propagation
1-8: Flow-Induced Noise and Vibration
1-9: Turbomachinery Noise
1-10: Noise, Vibration and Harshness in Automotive and Aerospace Systems
1-11: Human Perception of Acoustics
1-12: Vibration and Acoustic Measurements, Signal Processing, and Test Facilities
1-13: AI and Machine Learning in Acoustics and Vibrations
1-14: Micro-acoustics, Acoustofluidics, and Acoustic Devices/Sensors
1-15: Acoustic Materials: Modeling, Characterization and Applications
1-16: Congress-Wide Symposium on NDE & SHM: Ultrasonic Waves for Material Characterization and Damage Assessment
1-17: Congress-Wide Symposium on NDE & SHM: Computational Nondestructive Evaluation and Structural Health Monitoring

---

**ACKNOWLEDGMENT**

**TRACK ORGANIZERS**

Track Organizer: Yousof Azizi, Bridgestone Americas
Track Co-Organizer: Michael Frazier, University of California, San Diego
Track Co-Organizer: Yongfeng Xu, University of Cincinnati

**TOPIC ORGANIZERS:**

Andrei Zagrai, New Mexico Institute of Mining and Technology
Brent Paul, Serco
Charlie Zheng
Fabio Semperlotti, Purdue University
Feng Guo, Indiana University
Guoliang Huang, University of Missouri
Haijune Liu, Temple University
Hussein Nassar
Jiaze He, The University of Alabama
John Collinger, Naval Nuclear Laboratory
Joseph Blochberger, Johns Hopkins University
Joseph Blochberger, Johns Hopkins University
Kathryn Matlack, University of Illinois at Urbana-Champaign
Kristin Cody, Penn State University
Mahmoud Hussein, University of Colorado
Matt Plutt, New Mexico Institute of Mining and Technology
Michael Frazier, University of California, San Diego
Michael Jonson, Penn State University
Mostafa Nouh, University at Buffalo
Robert Tomko, Naval Nuclear Laboratory
Serife Tol, University of Michigan
Weidong Zhu, University of Maryland, Baltimore County
Xiaopeng Li
TECHNICAL SESSIONS

SESSION CHAIRS:

Andrei Zagrai, New Mexico Institute of Mining and Technology
Fabio Semperlotti, Purdue University
Feng Guo, Indiana University - Bloomington
Guoliang Huang, University of Missouri
Jiaze He, The University of Alabama
John Collinger, Naval Nuclear Laboratory
Joseph Blochberger, Johns Hopkins University
Kathryn Matlack, University of Illinois at Urbana-Champaign
Mahmoud Hussein, University of Colorado
Matt Plutt, New Mexico Institute of Mining and Technology
Michael Frazier, University of California, San Diego
Michael Jonson, Penn State University
Mostafa Nouh, University at Buffalo
Portia Banerjee, NASA Ames Research Center
Robert Tomko, Naval Nuclear Laboratory
Serife Tol, University of Michigan
Weidong Zhu, University of Maryland, Baltimore County
Xuan Zhu, The University of Utah
Yanfeng Shen, Shanghai Jiao Tong University
Yongfeng Xu, University of Cincinnati
Yousof Azizi, Bridgestone Americas

TRACK 1:
ACOUSTICS, VIBRATION, AND PHONONICS
WEDNESDAY, NOVEMBER 1

01-08-01: Flow-Induced Noise and Vibration
11/1/2023
10:45AM–12:30PM – Room 261

10:45AM
Assessing Acoustic Piping Vibration on a Naphtha Splitter Column Overhead Line

Technical Paper Publication: IMECE2023-111080
Carlos Herrera Sierralta - Saudi Aramco
Ibraheem Alsokairan - Saudi Aramco

11:06AM
A Comprehensive Review of Acoustic Induced Vibration Methodologies

Technical Paper Publication: IMECE2023-111400
Yuqing Liu - Bechtel Energy Inc.
Philip Diwakar - Bechtel Energy Inc.
Ismat Eljaouhari - Bechtel Energy Inc.
Lulin Shen - Bechtel Energy Inc.

11:27AM
Singularity Based Method for Small Perturbation Unsteady Aerodynamics Using Higher Fidelity Steady State Pressure Profiles

Technical Paper Publication: IMECE2023-112402
Auriane Bottai - Penn State University
Michael Jonson - PSU
Robert Campbell - Penn State University
TECHNICAL SESSIONS

11:48AM
Revisiting and Improving Pipe Wall Transmission Loss Estimation for Control Valve Noise Prediction
Technical Paper Publication: IMECE2023-112615
Daniel Eilers - Emerson Automation Solutions - Fisher Valves
Allen Fagerlund - Emerson - Fisher Heritage

01-02-01: Passive, Semi-Active, and Active Noise and Vibration Control
11/1/2023
10:45AM–12:30PM – Room 262
Chair: Yousof Azizi - Bridgestone Americas
Co-Chair: Yousof Azizi - Bridgestone Americas
Co-Chair: John Collinger - Naval Nuclear Laboratory

10:45AM
Optimal Design of Magnetic (Eddy Current) Dampers for Tuned Damping Applications
Technical Paper Publication: IMECE2023-112553
Abdulrhman Mohmmed H. Farran - The University of Dayton
Ahmad Kashani - University of Dayton

11:06AM
On the Reduction of the HVAC Noise Using Active and Passive Noise Control Technologies
Technical Paper Publication: IMECE2023-112362
Koki Shige - Toyama Prefectural University
Osamu Terashima - Toyama Prefectural University

11:27AM
A Composite Structure for Low-Frequency Sound Absorption With Continuous Broadband Under High Sound Pressure Excitations
Technical Paper Publication: IMECE2023-111199
Junzhe Zhu - Shanghai Jiao Tong University
Hao Gao - Shanghai Jiao Tong University
Yegao Qu - Shanghai Jiao Tong University
Guang Meng - Shanghai Jiao Tong University

11:48AM
Inverse Modeling of Porous Noise Absorbers With Triply Periodic Minimal Surface Architectures
Technical Presentation: IMECE2023-120117
Janith Godakawela - Michigan Technological University
Bhisham Sharma - Michigan Technological University
01-04-01: Phononics: Nonlinearity and Energy Harvesting
11/1/2023
10:45AM–12:30PM – Room 263

10:45AM
Resonator-Based Piezoelectric Metastructures: Efficient Bandgap Estimation and Parametric Analysis
Technical Paper Publication: IMECE2023-110579
Diego Astudillo - Universidad de Chile
Rafael O. Ruiz - University of Michigan-Dearborn

11:06AM
Development of a Broadband Energy Harvesting Technique Utilizing Acoustic Metamaterials
Technical Paper Publication: IMECE2023-111392
Andrew Todd - Georgia Southern University
Hossain Ahmed - University of South Carolina
Riaz Ahmed - University of Wisconsin

11:27AM
Intrinsic Energy-Harvesting of Piezoelectric Phononic Materials
Technical Presentation: IMECE2023-120358
Ibrahim Patrick - University of Bristol
Sondipon Adhikari - University of Glasgow
Mahmoud Hussein - University of Colorado - Colorado Springs

01-13-01 Acoustics and Vibrations: AI, ML and Acoustic Sensors and Devices
11/1/2023
2:00PM–3:45PM – Room 298

2:00PM
Measurement of Temperature Distributions in High Explosives via Acoustic Convolutional Neural Networks
Technical Presentation: IMECE2023-119379
John Greenhall - Los Alamos National Laboratory
Eric Davis - Los Alamos National Laboratory
Pavel Vakhlanov - Los Alamos National Laboratory
Craig Chavez - Los Alamos National Laboratory
Dave Zerkle - Los Alamos National Laboratory
Robert Broilo - Los Alamos National Laboratory
Abhishek Saini - Los Alamos National Laboratory
Cristian Pantea - Los Alamos National Laboratory

2:21PM
Multi-Sensor, Distance-Informed Deep Learning for Damage Detection and Characterization
Technical Presentation: IMECE2023-119963
Cole Maxwell - Los Alamos National Laboratory
Josh Tempelman - Los Alamos National Laboratory
Neel Shah - Los Alamos National Laboratory
Erica Jacobson - Los Alamos National Laboratory
Eric Flynn - Los Alamos National Laboratory
Adam Wachtor - Los Alamos National Laboratory
2:42 PM
External Device Pressure Monitoring of a Vessel Using Acoustic Resonance Spectroscopy and Machine Learning

Technical Presentation: IMECE2023-120137
Milo Prisbrey - Los Alamos National Laboratory
Daniel Pereira - Los Alamos National Laboratory
John Greenhall - Los Alamos National Laboratory
Cristian Pantea - Los Alamos National Laboratory

2:03PM
Modal Sensitivity Analysis of Acoustic Metamaterials for Structural Damage Detection

Technical Presentation: IMECE2023-119574
Yongfeng Xu - University of Cincinnati
Guoliang Huang - University of Missouri

3:03PM
Design and Realization of Microscopic Optical Acoustic Sensors

Technical Paper Publication: IMECE2023-113926
David Maupin - University of Pittsburgh
Christopher Dumm - University of Pittsburgh
George Klinzing - University of Pittsburgh
Carey Balaban - University of Pittsburgh
Jeffrey Vipperman - University of Pittsburgh

3:03PM
A Numerical Study on the Nonlinear Dynamic Characteristics of Hybrid SMA Composite Plates

Technical Presentation: IMECE2023-119752
Qianlong Zhang - Purdue University
Fabio Semperlotti - Purdue University

2:00PM
Characterization and Numerical Modelling of Underwater Sound Transmission Through Periodically Structured Polyurethane Tiles

Technical Paper Publication: IMECE2023-112265
Luke Hacquebard - Defence Research and Development Canada
Vincent Drover - Defence Research and Development Canada
Jeff Szabo - Defence Research and Development Canada

2:00PM
Bandgap Formation Patterns in Phononic Crystals

Technical Presentation: IMECE2023-120341
Hasan Al Ba’ba’a - Union College
Mostafa Nouh - University at Buffalo
How Low Is Low? A Critical Discussion of Low-Frequency Band Gaps and Their Practical Applications
Technical Presentation: IMECE2023-112639
Fei Chen - University of Utah
Faisal Jamil - University of Utah
Bolei Deng - Massachusetts Institute of Technology
Robert G. Parker - University of Utah
Pai Wang - University of Utah

Bound Modes in the Continuum Based Waveguides With Architected Elastic Structures
Technical Presentation: IMECE2023-113786
Raj Kumar Pal - Kansas State University
Adib Rahman - Kansas State University

On Designing Zero-Frequency Corner Modes in Elastically-Supported Honeycomb Lattices
Technical Presentation: IMECE2023-112668
Hasan Al Ba’ba’a - Union College

Mechanics Guided Characterization of Elastic Metamaterial
Technical Presentation: IMECE2023-120256
Mamdoudur Rahman - University Of South Carolina
Dale Hitchcock - Savannah River National Laboratory
William Johnson - Savannah River National Laboratory
Timothy Krentz - Savannah River National Laboratory
Andrew Gross - University of South Carolina

01-12-01 Vibration and Acoustic Measurements, Signal Processing, and Test Facilities

A Frozen-Time Method for Discontinuous Internal Forces of a Multi-Span Beam Carrying Moving Subsystems
Technical Paper Publication: IMECE2023-112778
Hao Gao - Shanghai Jiao Tong University
Ruiyang Wang - University of Southern California
Yegao Qu - Shanghai Jiao Tong University
Guang Meng - Shanghai Jiao Tong University

Full-Field Vibration Measurement on a Hollow Cylinder Using a Mirror-Assisted 3D CSLDV System
Technical Paper Publication: IMECE2023-116899
Ke Yuan - University of Maryland Baltimore county
Weidong Zhu - University of Maryland

Operational Modal Analysis and Baseline-Free Damage Detection of a Beam Under Random Excitation via a Novel Demodulation Method With a Reference Signal
Technical Paper Publication: IMECE2023-116852
Linfeng Lyu - University of Maryland Baltimore County
Ke Yuan - University of Maryland Baltimore County
Weidong Zhu - University of Maryland
5:03PM

Discrimination of Vibrotactile Stimuli: Effects of Frequency Variation

Technical Paper Publication: IMECE2023-112457
Nashmin Yeganeh - University of Iceland
Ivan Makarov - University of Iceland
Árni Kristjánsson - University of Iceland
Runar Unnthorsson - University of Iceland

01-16-01: Congress-Wide Symposium on NDE & SHM: Ultrasonic Waves for Material Characterization and Damage Assessment
11/1/2023
4:00PM–5:45PM – Room 262

4:00PM

Residual Stress Evaluation of Multilayer Viscoelastic Composites Using Ultrasonic Acoustoelastic Effects

Technical Paper Publication: IMECE2023-112029
Houfu Jiang - Shanghai Jiao Tong University
Yanfeng Shen - Shanghai Jiao Tong University
Tao Zhang - The 41st Institute of CASIC

4:21PM

Quantitative Imaging of Elongated Thickness Defects in Pipelines Using Ultrasonic Guided Wave Tomography

Technical Paper Publication: IMECE2023-112228
Carlos Omar Rasgado Moreno - Tallinn University of Technology
Madis Ratassepp - Tallinn University of Technology

4:42PM

Self-Sensing Piezoelectric Composite Structures via Generation and Reception of Ultrasonic Guided Waves

Technical Paper Publication: IMECE2023-112726
Shulong Zhou - University of Michigan-Shanghai Jiao Tong University Joint Institute
Yanfeng Shen - University of Michigan-Shanghai Jiao Tong University Joint Institute

5:03PM

Hypercomplex Wavefield Processing for Localized Thickness Estimation in Steady-State Ultrasonic Measurement

Technical Presentation: IMECE2023-113714
Joshua Tempelman - Los Alamos National Laboratory
Adam Wachtor - Los Alamos National Laboratory
Eric Flynn - Los Alamos National Laboratory

5:24PM

Nonlinear Scattering of Guided Waves From Impact Damage in Composite Panels

Technical Presentation: IMECE2023-119713
Yanfeng Shen - Shanghai Jiao Tong University
Houfu Jiang - Shanghai Jiao Tong University
Flora Hervin - University College London
Paul Fromme - University College London
THURSDAY, 11/2/2023

01-04-03: Phononic: Topological Phononics
11/2/2023
10:15AM–12:00PM – Room 261

10:15AM
Modal Decomposition of Topological Wave Propagation

Technical Presentation: IMECE2023-113828
Joshua Tempelman - University of Illinois At Urbana Champaign
Alexander Vakakis - University of Illinois at Urbana Champaign
Kathryn Matlack - University of Illinois at Urbana Champaign

10:36AM
Topological Modes in Moire Lattices of Bilayer Elastic Plates With Resonators

Technical Presentation: IMECE2023-114268
Tamanna Akter Jui - Kansas State University
Raj Kumar Pal - Kansas State University

10:57AM
A Novel Topological Invariant for Topological Edge Mode Prediction in a Su-Schrieffer-Heeger Model

Technical Presentation: IMECE2023-109283
Amir Rajabpoor Alisepahi - University of Vermont
Kai Sun - University of Michigan-Ann Arbor
Jihong Ma - University of Vermont

11:18AM
Topological Interface Modes in Triply Periodic Minimal Surface Materials for Elastic and Acoustic Waves

Technical Presentation IMECE2023-120034
Prabhakaran Manoharan - Georgia Institute of Technology
Alper Erturk - Georgia Institute of Technology

11:39AM
Nonreciprocal Transmission of Lamb Waves via Surface-Bonded Elastic Metamaterial Diode

Technical Paper Publication: IMECE2023-112944
Hexuan Xu - Shanghai Jiao Tong University
Yanfeng Shen - Shanghai Jiao Tong University

01-01-01 New Advances in Acoustics and Vibrations
11/2/2023
10:15AM–12:00PM – Room 262

10:15AM
A Study on the Vibro-Acoustic Analysis Technology About the Transformer Load-Noise

Technical Paper Publication: IMECE2023-110646
Minok Yun - Hyundai Electric & Energy Systems Co., Ltd.
Kanghyuok Lee - Hyundai Electric & Energy Systems Co., Ltd.
Changhoon Ahn - Hyundai Electric & Energy Systems Co., Ltd
Jinwoo Lee - Hyundai Electric & Energy Systems Co., Ltd
Jeehwoon Kang - Hyundai Electric & Energy Systems Co., Ltd
Changwook Kim - Hyundai Electric & Energy Systems Co., Ltd
Hyunseok Choi - Hyundai Electric & Energy Systems Co., Ltd
10:36AM
Ultrathin and Conformal Acoustic Moiré-Metamaterial Absorber for Broadband Noise Attenuation

Technical Presentation: IMECE2023-112361
O-Chang Kwon - Korea Institute of Science and Technology
Jae-Hyun Kim - Korea Institute of Machinery & Materials
Sung Hoon Kang - Johns Hopkins University, Baltimore
Myoung-Woon Moon - Korea Institute of Science and Technology

10:57AM
Smart Patterning for Topological Pumping of Elastic Surface Waves

Technical Paper Publication: IMECE2023-115083
Shaoyun Wang - University of Missouri, Columbia
Zhou Hu - Beijing Institute of Technology
Qian Wu - University of Missouri - Columbia
Rui Zhu - Beijing Institute of Technology
Guoliang Huang - University of Missouri - Columbia

11:18AM
Acoustic Metamaterials-Mediated Transdermal Drug Delivery

Technical Presentation: IMECE2023-112829
Hongwei Cai - Indiana University
Junhua Xu - Indiana University
Zhuhao Wu - Indiana University
Xiang Li - Indiana University
Chunhui Tian - Indiana University
Zheng Ao - Indiana University
Vivian C Niu - Indiana University
Xiao Xiao - University of California, Los Angeles
Lei Jiang - Indiana University

Marat Khodoun - Cincinnati Children’s Hospital Medical Center
Marc Rothenberg - Cincinnati Children’s Hospital Medical Center
Ken Mackie - Indiana University
Jun Chen - University of California, Los Angeles
Luke P Lee - Harvard Medical School
Feng Guo - Indiana University

01-17-01: Congress-Wide Symposium on NDE & SHM: Computational Nondestructive Evaluation and Structural Health Monitoring
11/2/2023
2:00PM–3:45PM – Room 261

2:00PM
Local Resonances for Rail Thermal Stress Estimation: Modeling and Field Test

Technical Presentation: IMECE2023-112358
Yuning Wu - The University of Utah
Keeping Zhang - The University of Utah
Xuan Zhu - The University of Utah
John Popovics - University of Illinois at Urbana-Champaign

2:21PM
Full Waveform Inversion-Based Ultrasonic Multi-Hole Imaging

Technical Presentation: IMECE2023-119745
Shoaib Anwar - The University of Alabama
Md Aktharuzzaman - The University of Alabama
John Day - The University of Alabama
Jiaze Ha - The University of Alabama
2:42PM
Harnessing Zero-Group-Velocity and Evanescent Modes in Structural Components

Technical Presentation: IMECE2023-116624
Peng Zhang - The University of Utah
Pai Wang - The University of Utah
Xuan Peter Zhu - The University of Utah

3:03PM
2D CNNs-Based Time-Domain Full Waveform Inversion Improvement

Technical Presentation: IMECE2023-119748
Shoaib Anwar - The University of Alabama
Austin Yunker - Argonne National Laboratory
Rajkumar Kettimuthu - Argonne National Laboratory
Mark Anastasio - University of Illinois at Urbana-Champaign
Umberto Villa - The University of Texas at Austin
Jiaze He - The University of Alabama

01-16-02: Congress-Wide Symposium on NDE & SHM:
Ultrasonic Waves for Material Characterization and Damage Assessment
11/2/2023
2:00PM–3:45PM – Room 262

2:00PM
Improved Non-Contact Ultrasonic High-Speed Structural Condition Monitoring of Rails Using a Controlled Acoustic Source and Random Wheel Generated Excitations

Technical Paper Publication: IMECE2023-113918
Diptojit Datta - University of California, San Diego
Ali Zare Hosseinzadeh - University of California, San Diego
Izabela Batista - University of California, San Diego
Francesco Lanza Di Scalea - University of California, San Diego

2:21PM
Development of a Non-Destructive Ultrasonic Technique for In-Situ Battery Health Monitoring

Technical Paper Publication: IMECE2023-113961
Md Rakib Hossen - Georgia Southern University
Hossain Ahmed - Georgia Southern University
Asef Ishraq Sadaf - Georgia Southern University
Md Arif Iqbal Khan - Georgia Southern University
Grant Bennett - Georgia Southern University
Rajib Mahamud - Idaho State University

2:42PM
Ultrasonic Monitoring of Sensitization in Aluminum Alloys

Technical Paper Publication: IMECE2023-114423
Gabriela Petculescu - University of Louisiana at Lafayette
3:03PM

2D Ultrasound Computed Tomography for Experimental Elastic Material Characterization

Technical Presentation: IMECE2023-119764
Md Aktharuzzaman - The University of Alabama
Shoaib Anwar - The University of Alabama
Dmitry Borisov - The University of Kansas
Jiaze He - The University of Alabama

3:24PM

Effects of High-Intensity Focused Ultrasound on Bonding Characteristics of Laminated Thin Materials

Technical Presentation: IMECE2023-119909
Jacob Brody - Georgia Institute of Technology
Prabhakaran Manogharan - Georgia Institute of Technology
Alper Erturk - Georgia Institute of Technology
Nathan Moore - Sandia National Laboratories

4:21PM

Investigation of Mechanically Fatigued Low-Frequency Energy Harvesting Effect on Isotropic Materials

Technical Paper Publication: IMECE2023-113666
Daniel Meade - Georgia Southern University
Hossain Ahmed - Georgia Southern University
Riaz Ahmed - University of Wisconsin Green Bay
Patrick Riggs - Georgia Southern University

4:42PM

Research and Application of Parameter Verification Technology for Health Monitoring of NPP I&C Board Based on Field Fault Analysis

Technical Paper Publication: IMECE2023-112485
Xiaopeng Zhao - China Techenergy Co., Ltd.
Guilian Shi - China Techenergy Co., Ltd.
Hongwei Pei - China Techenergy Co., Ltd.
Fangjie Wu - China Techenergy Co., Ltd.

5:03PM

Maxon and Its Local Resonance in Elastic Metamaterials

Technical Presentation: IMECE2023-114326
Peng Zhang - The University of Utah
Fei Chen - University of Utah
Keping Zhang - University of Utah
Pai Wang - University of Utah
Xuan Zhu - University of Utah
Track 2: Advanced Design and Information Technologies

Topics:
2-1: Produce and Process Design
2-2: Computer Aided for X
2-3: Optimization
2-4: Data Driven Design
2-5: eXtended Reality in Design
2-6: IoT and Digital Twins
2-7: Advances in Human Modelling
2-8: Design for Healthcare Products and Processes
2-9: Smart Cyber-Physical Systems Design
2-11: Design for Additive Manufacturing

ACKNOWLEDGMENT

TRACK ORGANIZERS

Track Organizer: Miri Weiss-Cohen, ORT Braude College of Engineering
Track Co-Organizer: Marco Rossoni, Politecnico di Milano
Track Co-Organizer: Rodrigo Silva, Universidade Federal de Ouro Preto

TOPEIC ORGANIZERS:

Andrea Petruccioli
Anna Ghidotti, University of Bergamo
Catalin Stoean
Daniel Lanzoni, University of Bergamo
Daniele Regazzoni, University of Bergamo
Eduardo Luz
Fabio Pini, University of Modena and Reggio Emilia
Francesca Negrello, Italian Institute of Technology
Frederico G. Guimaraes
Giovanni Berselli
Gregor Harih
Gunther Paul
Marco Mandolini, Università Politecnica delle Marche
Marco Rossoni, Politecnico di Milano
Marta Rossi
Michal Koren
Michele Bertolini, Politecnico di Milano
Po Ting Lin
Sofia Scataglini
Tuomas Puttonen
Vinayak Krishnamurthy
Yan Wang, University of Nevada, Reno
Yariv Marmor

SESSION CHAIRS:

Anna Ghidotti, University of Bergamo
Christoph Kempf, Karlsruhe Institute of Technology
Daniel Lanzoni, University of Bergamo
Enrico Dalpadulo, Università di Modena e Reggio Emilia
Fabio Pini, University of Modena and Reggio Emilia
Manoj Kumar Sharma, Santa Clara University
Marco Rossoni, Politecnico di Milano
Mikhailo Sartini, Università Politecnica delle Marche
Moritz Schoeck, Karlsruhe Institute of Technology
Soumik Banerjee, Washington State University
Yoram Halevi, Technion
Yucheng Liu, South Dakota State University
TECHNICAL SESSIONS

TRACK 2: ADVANCED DESIGN AND INFORMATION TECHNOLOGIES
WEDNESDAY, NOVEMBER 1

02-01-01: Product and Process Design
11/1/2023
10:45AM–12:30PM – Room 264

10:45AM
Addressing Software/Hardware Challenges by Incorporating System Software Integrator Certification
Technical Paper Publication: IMECE2023-114384
Bart Kemper - Kemper Engineering Services, LLC
Phillip A. Laplante - Penn State

11:06AM
Influence of Agility on the Innovation Capability of Organizations - An Empirical Study
Technical Paper Publication: IMECE2023-113522
Moritz Schoeck - Karlsruhe Institute of Technology
Mona Batora - University of Technology Hamburg-Harburg
Johannes Mueller - Karlsruhe Institute of Technology
Nikola Bursac - University of Technology Hamburg-Harburg
Albert Albers - Karlsruhe Institute of Technology

11:27AM
Computer-Based Methodology for GD&T Allocation and Stack-Up Analysis for Automotive Components
Technical Presentation: IMECE2023-120254
Fabio Pini - University of Modena and Reggio Emilia
Enrico Dalpadulo - University of Modena and Reggio Emilia
Francesco Leali - University of Modena and Reggio Emilia

11:48AM
An Agent-Based Modeling Approach for the Diffusion Analysis of Electric Vehicles With Two-Stage Purchase Choice Modeling
Technical Paper Publication: IMECE2023-113154
Jiawen Xu - Shanghai Jiao Tong University
Youyi Bi - Shanghai Jiao Tong University

02-02-01: Design, Modeling and Systems
11/1/2023
2:00PM–3:45PM – Room 264

2:00PM
Evaluation of the NIOSH Index
Technical Paper Publication: IMECE2023-113495
Daniel Lanzoni - University of Bergamo
Francesca Negrello - Italian Institute of Technology
Andrea Vitali - University of Bergamo
Daniele Regazzoni - University of Bergamo
Manuel G. Catalano - Italian Institute of Technology
Caterina Rizzi - University of Bergamo
2:21PM
Voxel Printing of a Multi-Material 3D Printed Prosthetic Socket Based on FEM Simulations

Technical Paper Publication: IMECE2023-113297
Riccardo Pigazzi - Politecnico di Milano
Michele Bertolini - Politecnico di Milano
Marco Rossoni - Politecnico di Milano
Giorgio Colombo - Politecnico di Milano

2:42PM
Human Modelling and Design of Custom-Made Knee Implants: Definition of an Automatic Procedure

Technical Paper Publication: IMECE2023-112550
Anna Ghidotti - University of Bergamo
Andrea Vitali - University of Bergamo
Daniele Regazzoni - University of Bergamo
Caterina Rizzi - University of Bergamo

3:03PM
Toward Position Approximation Using Asynchronous Multi-View Cameras: A 2D Investigation With Probabilistic Considerations

Technical Paper Publication: IMECE2023-113616
Christopher Civetta - U.S. Naval Academy
Michael Kutzer - U.S. Naval Academy

3:24PM
Bi-Level 3D Reconstruction of Malignant Pleural Mesothelioma Volume From CT Images

Technical Paper Publication: IMECE2023-112558
Anna Ghidotti - University of Bergamo
Daniele Regazzoni - University of Bergamo
Miri Weiss Cohen - Braude College of Engineering

02-04-01: Data Driven Design
11/1/2023
4:00PM–5:45PM – Room 263

4:00PM
Control Co-Design of Battery Packs With Immersion Cooling

Technical Paper Publication: IMECE2023-112873
Zheng Liu - University of Illinois at Urbana-Champaign
Jiaxin Wu - University of Illinois at Urbana-Champaign
Wuchen Fu - University of Illinois at Urbana-Champaign
Pouya Kabirzadeh - University of Illinois at Urbana-Champaign
In-Bum Chung - University of Illinois at Urbana-Champaign
Mohammed Jubair Dipto - University of Illinois at Urbana-Champaign
Nenad Miljkovic - University of Illinois at Urbana-Champaign
Pingfeng Wang - University of Illinois at Urbana-Champaign
Yumeng Li - University of Illinois at Urbana-Champaign

4:21PM
Data-Driven Simulation, Optimization and Design in Heavy Machinery Industry

Technical Presentation: IMECE2023-115217
Yangfan Li - Northwestern University
Xiaoyu Xie - Northwestern University
Jiachen Guo - Northwestern University
Hengyang Li - Northwestern University
Jingfei Qiao - Northwestern University
Brian Tao - XCMG American Research Corp.
Nathan Zhang - XCMG American Research Corp.
Tian Tian - XCMG American Research Corp.
<table>
<thead>
<tr>
<th>Time</th>
<th>Session Title</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>4:42PM</td>
<td>Importance of Data Scaling for Various Machine Learning Models: A Case Study Based on Ionic Liquids for Processing Extra-Terrestrial Regolith</td>
<td>Fatlum Rexhepi - Washington State University, Soumik Banerjee - Washington State University</td>
</tr>
<tr>
<td>5:03PM</td>
<td>The Impact of Different Backbone Architecture on Autonomous Vehicle Dataset</td>
<td>Ning Ding - Virginia Polytechnic Institute and State University, Azim Eskandarian - Virginia Polytechnic Institute and State University</td>
</tr>
<tr>
<td>5:24PM</td>
<td>Classification of Brain Malignant Tumors Using MRI Scans and CNN Architectures With Optimized Hyperparameters</td>
<td>Miri Weiss Cohen - Braude College of Engineering</td>
</tr>
<tr>
<td>4:00PM</td>
<td>Classification-Based Multi-Fidelity Adaptive Sampling for Optimization and Surrogate Modeling</td>
<td>Christopher D. Noble - University of Arizona, Samy Missoum - University of Arizona</td>
</tr>
<tr>
<td>4:42PM</td>
<td>Design and Development of an Adjustable Constant Force Mechanism</td>
<td>Shane Johnson - Shanghai Jiao Tong University, Tanzeel Ur Rehman - Shanghai Jiao Tong University</td>
</tr>
<tr>
<td>5:03PM</td>
<td>A Computational Study on Adaptive Multiobjective Optimization of Blowout Preventer Valve System</td>
<td>Fei Song - Schlumberger, Laurent Caekebeke - Schlumberger, Prabhu Jagadesan - Schlumberger, Ke Li - Schlumberger</td>
</tr>
</tbody>
</table>
5:24PM
Bi-Level Optimal Control of Redundant Robotic Systems
Technical Presentation: IMECE2023-119041
Sahar Tidhar - Technion – Israel Institute of Technology
Yoram Halevi - Technion – Israel Institute of Technology

02-01-02: Product and Process Design
11/2/2023
10:15AM–12:00PM – Room 263

10:15AM
Analysis of Contact Positions of Inspection Tool for Motorcycle Safety Verification
Technical Paper Publication: IMECE2023-113085
Masatomo Inui - Ibaraki University
Nobuyuki Umezu - Ibaraki University

10:36AM
Proposal of Support Method for Directing Exploration and Exploitation in Engineering Design
Technical Paper Publication: IMECE2023-112488
Masahiro Okamoto - The University of Tokyo
Tamotsu Mrakami - The University of Tokyo

10:57AM
Modular and Reconfigurable Multiple Drive-Unit Based Rover: Design and Control
Technical Paper Publication: IMECE2023-112155
Manoj Sharma - Santa Clara University
Christopher Kitts - Santa Clara University

11:18AM
Engineering a Cost-Effective Solution for Measuring Sea Turtles’ Responses to Hypoxia
Technical Paper Publication: IMECE2023-111634
Fatima Elzahra Essassi - South Dakota State University
Yucheng Liu - South Dakota State University

02-05-01: Design for Additive Manufacturing
11/2/2023
10:15AM–12:00PM – Room 264

10:15AM
Additive Manufacturing for Investment Casting: Economic Comparison Between Digital Light Processing and Wax Moulding
Technical Paper Publication: IMECE2023-112223
Marco Mandolini - Università Politecnica delle Marche
Mikhailo Sartini - Università Politecnica delle Marche
Claudio Favi - Università di Parma
Michele Germani - Università Politecnica delle Marche

10:36AM
Design by Simulation and Additive Manufacturing of Cooled Electronics Carriers for Autonomous Driving Systems
Technical Presentation: IMECE2023-120121
Enrico Dalpadulo - Università di Modena e Reggio Emilia
Alberto Vergnano - Università di Modena e Reggio Emilia
Francesco Leali - Università di Modena e Reggio Emilia
<table>
<thead>
<tr>
<th>Time</th>
<th>Session Title</th>
<th>Location</th>
<th>Details</th>
</tr>
</thead>
</table>
Sebastian Roth - Institute of Laser and System Technologies  
Michel Krukenberg - Technical University Hamburg  
Claus Emmelmann - Institute of Laser and System Technologies |
Mario Brandon Russo - University of Campania Luigi Vanvitelli  
Salvatore Gerbino - University of Campania Luigi Vanvitelli |
| 11:39AM    | Ontology-Based Workflow for the Design and Additive Manufacturing of Heterogeneous Objects Through Multi-Material Voxel Printing | Technical Presentation: IMECE2023-119912 | Marco Rossoni - Politecnico di Milano  
Riccardo Pigazzi - Politecnico di Milano  
Giorgio Colombo - Politecnico di Milano |
| 2:00PM     | Cobosort – An Integrated Design Approach for Human-Robot Collaborative Sorting | Technical Presentation: IMECE2023-120096 | Fabio Pini - University of Modena and Reggio Emilia  
Luigi Biagiotti - University of Modena and Reggio Emilia  
Francesco Leali - University of Modena and Reggio Emilia |
| 2:21PM     | Success Factors and Barriers in Industry-Academia Collaborations: A Descriptive Model | Technical Paper Publication: IMECE2023-112574 | Christoph Kempf - Karlsruhe Institute of Technology  
Imke Hellwig - Karlsruhe Institute of Technology  
Annika Bastian - Karlsruhe Institute of Technology  
Katharina Ritzer - Hamburg University of Technology  
Albert Albers - Karlsruhe Institute of Technology |
| 2:42PM     | Workspace Specific Robot Arm Design | Technical Paper Publication: IMECE2023-113461 | Christoph August Wilhelm Parhofer - Technical University of Munich  
Felix Pancheri - Technical University of Munich  
Christoph Rehekampff - Technical University of Munich  
Tim Christian Lueth - Technical University of Munich |
**3:03PM**


Technical Paper Publication: IMECE2023-112222  
Bastian Quattelbaum - HS Niederrhein  
Christine Steinem - HS Niederrhein  
Marc Neumann - HS Niederrhein

**2:21PM**

Inversion Method of Material Parameters in Different Areas of Automotive Tires Based on Stiffness Experiment

Technical Paper Publication: IMECE2023-111662  
Yuling Lang - CITIC Dicastal Co., Ltd.  
Yizhuo Wang - Beihang University  
Shenglong Yuan - CITIC Dicastal Co., Ltd.  
Jintao Luo - Beihang University  
Decai Kong - CITIC Dicastal Co., Ltd.  
Yingchun Shan - Beihang University  
Shiwen Xu - CITIC Dicastal Co., Ltd.

**3:24PM**

Detecting 3D Skeleton Motion Using a Deep Learning Approach

Technical Presentation: IMECE2023-110333  
Miri Weiss Cohen - Braude College of Engineering

**2:42PM**

A CO2 Emissions Life Cycle Assessment of Additive and Conventional Manufacturing Based Lightweight Design in the Automotive

Technical Paper Publication: IMECE2023-112528  
Enrico Dalpadulo - Università Degli Studi di Modena e Reggio Emilia  
Fabio Pini - Università di Modena e Reggio Emilia  
Francesco Leali - Università di Modena e Reggio Emilia

**2:00PM**

Variable Radius Fillet Shape Analysis to Minimize Stress Concentration Effects: Learning From Trees for Sustainable Design

Technical Paper Publication: IMECE2023-116420  
Mark Warner - California State Polytechnic University-Pomona  
Gustavo Vargas-Silva - Public University of Navarra  
Mariappan Jawaharlal - California State University, Sacramento

**3:03PM**

Optimization of Turbomachinery Design for S R - 30 Small Scale Gas Turbine Engine Using Machine Learning

Technical Presentation: IMECE2023-117049  
Sowmya Raghu - University of South Carolina  
Jamil Khan - University of South Carolina
Track 3: Advanced Manufacturing

Topics:
3-1: 8th Annual Conference-Wide Symposium on Additive Manufacturing
3-2: Congress-Wide Symposium on NDE & SHM: Measurement Science, Sensors, Non-destructive Evaluation (NDE) and Process Monitoring and Control for Advanced Manufacturing
3-4: Advanced Machining and Finishing Processes
3-5: 8th Symposium on Fastening and Joining Research and Advanced Technology
3-6: Advanced Material Forming - Mechanics, Characterization, Novel Processes, and Control
3-7: Innovative Product and Process Design
3-8: Computational Modeling and Simulation for Advanced Manufacturing
3-9: Variation Simulation and Design for Assembly
3-10: Robotics and Automation in Advanced Manufacturing
3-11: Laser-Based Advanced Manufacturing and Material Processing
3-12: Digital Manufacturing Process Simulation and Validation
3-13: Conference-Wide Symposium on Biomedical Manufacturing & Materials
3-14: Symposium on Sustainable Manufacturing
3-15: Novel Verification, Validation, and Uncertainty Quantification (VVUQ) Techniques and Approaches for Advanced Manufacturing
3-16: Manufacturing: General
3-21: Soft Robotics, Machine, and Intelligence

ACKNOWLEDGMENT

Track Organizers
Track Organizer: Scott Thompson, Kansas State University
Track Co-Organizer: Ross Salary, Marshall University
Track Co-Organizer: Yifei Jin, University of Nevada
Track Co-Organizer: Sekhar Rakurty, MK Morse Co.

TOPIC ORGANIZERS:
Arun Muley, Boeing Research and Technology
Byeong-Min Roh, The Pennsylvania State University
Chao Ma
Chetan Nikhare, Penn State Erie
Chih-Hao Chang
Daniel Cox, Georgia Southern University
David A. Guerra-Zubiaga, Kennesaw State University
Florian Sayer
Germanico Gonzalez-Badillo, Universidad Autonoma de San Luis Potosi
Haley Doude, Mississippi State University
Halil Tekinalp, Oak Ridge National Laboratory
Haseung Chung, Michigan State University
Hossein Taeri, Georgia Southern University
Hua Wang, Shanghai Institute of Technology
Jeff Ma
Joao Sousa, Instituto Nacional de Estadística y Geografía
Kevin Dowding, Sandia National Laboratories
Kristina Warmefjord
Lokesh Saharan, The University of Texas Permian Basin
Machael Cai Wang
Marco Gerini-Romagnoli, Oakland University
Matthew Maschmann, University of Missouri
Michelle Pagano, ASME
Mike Myers, Oregon Institute of Technology
Murat Aksu, National Institute of Standards and Technology
Nathan Crane, Brigham Young University
Nithin Rangasamy
Pilgyu Kang, George Mason University
Puneet Tandon, Indian Institute of Information Technology, Design and Manufacturing
Qiong Nian
Roozbeh (Ross) Salary, Marshall University
Salman Pervaiz, RIT Dubai
Sathish Kannan, American University of Sharjah
Sayed Nassar, Oakland University
Scott Thompson
Sekhar Rakurty, MK Morse Co.
SESSION CHAIRS:

Arun Muley, Boeing Research and Technology
Byeong-Min Roh, Pennsylvania State University
Chandra Sekhar Rakurty, MK Morse Co.
Chetan Nikhare, Penn State Erie
Chih-Hao Chang
Daniel Cox, Georgia Southern University
David Guerra-Zubiaga, Kennesaw State University
Florian Sayer
Germanico Gonzalez-Badillo, Universidad Autonoma de San Luis Potosi
Haley Doude, Mississippi State University
Halil Tekinalp, Oak Ridge National Laboratory
Haseung Chung, Michigan State University
Hossein Taheri, Georgia Southern University
Hua Wang, Shanghai Institute of Technology
Jianfeng Ma, Saint Louis University
Jiaze He, The University of Alabama
João Sousa, University of Porto
Kristina Wärmefjord, Chalmers University of Technology
Lokesh Saharan, The University of Texas Permian Basin
Marco Gerini-Romagnoli, Oakland University
Matthew Maschmann, University of Missouri
Michael Cai Wang, University of South Florida
Mike Myers, Oregon Institute of Technology
Murat Aksu, The National Institute of Standards and Technology
Nathan Crane, Brigham Young University
Pilgyu Kang, George Mason University
Puneet Tandon, Indian Institute of Information Technology, Design and Manufacturing
Qiong Nian
Roozbeh (Ross) Salary, Marshall University
Salman Pervaiz, RIT Dubai
Sathish Kannan, American University of Sharjah
Sayed Nassar, Oakland University
Scott M. Thompson, Kansas State University
Shanshan Yao
Shinichi Warisawa
Shunyu Liu
Stephen Baek, University of Virginia
Tim Röver
Vladimir Kuts, Tallinn University of Technology
William Emblom, Emblom Engineering
Xiangyang Dong, Missouri University of Science and Technology
Xinyi Xiao, Miami University
Xuedao Shu, Ningbo University
Yeqing Wang, Syracuse University
Yifei Jin, University of Nevada
Yucheng Liu, South Dakota State University
### TECHNICAL SESSIONS

#### TRACK 3: ADVANCED MANUFACTURING
**MONDAY, OCTOBER 30**

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Technical Paper/Publication</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>10:45AM</td>
<td>Advances in Light Processing Based Additive Manufacturing: From Digital Light Processing to Ultrafast Laser Direct Writing</td>
<td>Technical Presentation: IMECE2023-113591</td>
<td>SeungYeon Kang - University of Connecticut</td>
</tr>
<tr>
<td>11:06AM</td>
<td>Modeling and Optimization of Frontal Polymerization-Based Reactive Direct Ink Writing of Composite Tows</td>
<td>Technical Presentation: IMECE2023-119653</td>
<td>Michael Zakoworotny - University of Illinois at Urbana-Champaign, Nadim Hmeidat - University of Illinois at Urbana-Champaign, Gavin Debrun - University of Illinois at Urbana-Champaign, Nancy Sottos - University of Illinois at Urbana-Champaign, Sameh Tawfick - University of Illinois at Urbana-Champaign, Philippe Geubelle - University of Illinois at Urbana-Champaign</td>
</tr>
<tr>
<td>12:09PM</td>
<td>Creating Stronger Interfaces in Additively Manufactured Multimaterial Polymer Composites Under Shear Loading</td>
<td>Technical Paper Publication: IMECE2023-113851</td>
<td>Umut Altuntaş - Middle East Technical University, Demirkan Coker - Middle East Technical University, Denizhan Yavas - Lamar University</td>
</tr>
</tbody>
</table>
03-04-01: Advanced Machining and Finishing Processes
10:45AM–12:30PM
Room, 262

10:45AM
Self-Organizing Genetic Algorithm Based Method for Modeling and Optimizing Machinability Metrics of AZ91 Magnesium Alloy

Technical Presentation: IMECE2023-115316
Osama Aljarrah - Youngstown State University
Salman Pervaiz - Rochester Institute of Technology of Dubai

11:06AM
A Preliminary Study of Machining Characteristics of Lens Titanium Alloy (Ti-6Al-4V)

Technical Paper Publication: IMECE2023-111260
Ashwin Polishetty - AUT University
Guy Littlefair - AUT University

11:27AM
Experimental Investigation and Optimization of the Effect of Burnishing Process Parameters on Surface Roughness and Hardness of Al 2036

Technical Paper Publication (Iran): IMECE2023-111731
Ali reza Asad beygi - University of Pittsburgh
Hamed Rezaie - Islamic Azad University
Abdolhossein Jalali Aghchai - K. N. Toosi University of Technology

11:48AM
Modeling and Investigation of Spatial Operation Stiffness in Robotic Milling Process Considering Bidirectional Weak-Stiffness of Robot-Workpiece System

Technical Paper Publication: IMECE2023-112221
Qunfei Gu - Shanghai Jiao Tong University
Shun Liu - Shanghai Jiaotong University
Sun Jin - Shanghai Jiaotong University

12:09PM
On-Machine Positioning Method for Integral Impellers Based on Three-Dimensional Point Cloud

Technical Paper Publication: IMECE2023-112717
Weihua Chen - Tsinghua University
Peiqing Ye - Tsinghua University

03-06-01: Advanced Material Forming – Mechanism, Characterization, Novel Processes, and Control
10/30/2023
2:00PM–3:45PM – Room 261

2:00PM
Toward Better Formability of Polymeric Materials in Single Point Incremental Forming: Effect of Process Parameters

Technical Paper Publication: IMECE2023-112000
Clayton Upcraft - Penn State University, Erie
Rachel Diefenderfer - Penn State University, Erie
Chad Vanderwiel - Penn State University, Erie
Inhab Ragai - Penn State University, Erie
2:42PM
The Demonstration of a Low-Cost Tabletop Microscale Hydroforming System With a Self-Aligning Sealing System

Technical Paper Publication: IMECE2023-110508
William Emblom - Emblom Engineering
Connor Frederick - University of Louisiana at Lafayette
Grant Carline - University of Louisiana at Lafayette
Kenneth Earles - University of Louisiana at Lafayette
Collin Taylor - University of Louisiana at Lafayette
Diep Tran - University of Louisiana at Lafayette
Brock Cambre - University of Louisiana at Lafayette
Bradley Castille - University of Louisiana at Lafayette
Ayotunde Olayinka - University of Louisiana at Lafayette
Paul Darby - University of Louisiana at Lafayette
Scott Wagner - Michigan Technological University
Farzad Ferdowsi - University of Louisiana at Lafayette

3:03PM
Sustainability and Recent Experimental Advances on the Production of Metallic Bipolar Plates of PEM Fuel Cell Using Electromagnetic Forming Technique

Technical Paper Publication: IMECE2023-112198
Shanmuga Sundaram Karibeeran - Anna University
Mohammed Abdul Kadar Rahiman - Anna University
Pradeep Kumar Murugesan - Anna University
Jebin Rex Justin - Anna University

2:00PM
Electropolishing (EP), ChemPolishing (CP), and As-Built Additively Manufactured Metal Components for Electroless Nickel Plating Research

Technical Paper Publication: IMECE2023-114338
Pablo E. Sanchez Guerrero - University of the District of Columbia
Pawan Tyagi - University of the District of Columbia

2:21PM
Waterjet Process Parameters Optimization

Technical Paper Publication: IMECE2023-115307
Basel Alsayyed - Western Carolina University
Frederick Malm - Western Carolina University
2:42PM

The Effect of Pulsed Power During Electrochemical Surface Modification on the Wettability of Aluminum and Titanium Alloy

Technical Paper Publication: IMECE2023-116611
Anton Petrenko - Grand Valley State University
Abishek Balsamy Kamaraj - Grand Valley State University

3:03PM

A Model-Based Identification Method of Variable Working Condition for Multi-Toothed Face Milling Process

Technical Paper Publication: IMECE2023-116662
Shun Liu - Shanghai Jiao Tong University
Sun Jin - Shanghai Jiao Tong University
Qunfei Gu - Shanghai Jiao Tong University
Xueming Du - Shanghai Jiao Tong University
Yang Xiang - Shanghai Jiao Tong University

3:24PM

Study of the Effect of Toolpath and Machining Parameters on Sphericity, Surface Finish, and Dimensional Tolerance of Polymer Acetabular Cups

Technical Paper Publication: IMECE2023-113419
Ernestina Becerra-Becerra - Universidad de Guanajuato
Agustin Vidal-Lesso - Universidad de Guanajuato
Alberto Saldaña-Robles - Universidad de Guanajuato
Juan Francisco Reveles-Arredondo - Universidad de Guanajuato

4:00PM

Enhancing Surface Finishing of Additively Manufactured Metal Components Through Electroless Nickel Plating and Machine Learning-Assisted Instance Segmentation

Technical Paper Publication: IMECE2023-114979
Wondwosen Demisse - University of the District of Columbia
Betelhem Mengesha - University of the District of Columbia
Lucas Rice - Honeywell Federal Manufacturing & Technologies, LLC
Pawan Tyagi - University of the District of Columbia

4:21PM

Real-Time Automated Control of Extrusion 3D Printing of a Frontally Polymerizing Gel

Technical Presentation: IMECE2023-118933
Devin Roach - Sandia National Laboratories
Samuel Leguizamon - Sandia National Laboratories
Adam Cook - Sandia National Laboratories

4:42PM

Acoustic Emission-Based Monitoring for Enhanced Quality Control in Fused Deposition Modeling 3D Printing

Technical Presentation: IMECE2023-120114
Ethan Phillips - Prairie View A&M University
Cori Yancy - Prairie View A&M University
Rambod Rayegan - Prairie View A&M University
Jaejong Park - Prairie View A&M University
5:03PM
In Situ Real Time Defect Detection for Additive Manufacturing via Multilocation Infrared Temperature Sensing

Technical Presentation: IMECE2023-120005
Arden Moore - Louisiana Tech University
Rifat-E-Nur Hossain - Louisiana Tech University

5:24PM
Optical Observation and Control of Polymer Sintering in the Large Area Projection Sintering Process

Technical Presentation: IMECE2023-111630
Nathan Crane - Brigham Young University
Derek Black - Brigham Young University

03-04-02: Advanced Machining and Finishing Processes
10/30/2023
4:00PM–5:45PM – Room 262

4:00PM
Finite Element Analysis and Process Parameters Optimization of AA2024 – T351 Alloy Machining Under Different Cooling Environments

Technical Paper Publication: IMECE2023-113383
Salman Pervaiz - RIT Dubai
Sathish Kannan - American University of Sharjah
Shafahat Ali - University of Guelph

4:42PM
A Futuristic Approach to Micro-Milling With Linear Motion Compliant Mechanism Based Platforms

Technical Paper Publication: IMECE2023-112899
Abhijit Anandrao Tanksale - Indian Institute of Technology Bombay
Ratnesh Bafna - Indian Institute of Technology Bombay
Prasanna Gandhi - Indian Institute of Technology Bombay

5:03PM
Effect of Layering Sequence on the Characteristics of Wire Arc Additive Manufactured Parts

Technical Paper Publication: IMECE2023-112918
Muralimohan Cheepu - STARWELDS Inc.
Ragavanantham Shanmugam - Fairmont State University
Mohanavel Vinayagam - Bharath Institute of Higher Education and Research
Seth Dennison - Navajo Technical University
5:24PM  
Research on Optimization of Sampling Feature Points for On-Machine Measurement of Integral Impeller Blade Profile  
Technical Paper Publication: IMECE2023-113134  
Weishu Song - Tsinghua University  
Bingran Li - Tsinghua University  
Peiqing Ye - Tsinghua University  
Weihua Chen - Tsinghua University  
03-16-01: Manufacturing: General  
10/30/2023  
4:00PM–5:45PM – Room 291

4:00PM  
Error Budget of Wafer Bonding Alignment System Based on Machine Vision  
Technical Paper Publication: IMECE2023-112938  
Rui Wang - Tsinghua University  
Sen Lu - Beijing Key Laboratory of Precision/Ultra-Precision Manufacturing Equipments and Control  
Kaiming Yang - Beijing Key Laboratory of Precision/Ultra-Precision Manufacturing Equipments and Control  
Yu Zhu - Tsinghua University

4:21PM  
Parametric Modeling of Lattice Structures for Manufacturing via Masked Stereolithography Apparatus  
Technical Paper Publication: IMECE2023-112988  
Benjamin Sherwood - The University of Oklahoma  
Christopher Billings - The University of Oklahoma  
Yingtao Liu - The University of Oklahoma

4:42PM  
Mechanical Analysis of an Additive Manufactured Deflecting-Tapered-Land Hydrodynamic Thrust Bearing  
Technical Paper Publication: IMECE2023-112998  
Isaiah Yasko - Ohio University  
William Downs - Ohio University  
Collier Fois - Ohio University  
Muhammad Ali - Ohio University  
Brian Wisner - Ohio University  
Rick Walker - Miba Bearings

5:03PM  
Experimental Determination of Load-Carrying Capacity of Modified Tapered-Land Hydrodynamic Thrust Pad Bearings  
Technical Paper Publication: IMECE2023-113022  
Jenna Trammell - Ohio University  
Collier Fois - Ohio University  
Muhammad Ali - Ohio University  
Rick Walker - MIBA Bearings

5:24PM  
Fabrication of Ultra-High Aspect Ratio Array Structures Using Spontaneous Evolution in Multiport Lifted Hele-Shaw Cell  
Technical Paper Publication: IMECE2023-113267  
Makrand Rakshe - Indian Institute of Technology Bombay  
Prasanna Gandhi - Indian Institute of Technology Bombay
TUESDAY, OCTOBER 31

03-01-03: 7th Annual Conference-Wide Symposium on Additive Manufacturing: Ceramics and Cementitious Materials
10/31/2023
10:15AM–12:00PM – Room 261

10:15AM
A Stabilized Interface Method for 3D Printing With Cementitious Materials

Technical Presentation: IMECE2023-112852
Arif Masud - University of Illinois at Urbana-Champaign
Ignasius Wijaya - University of Illinois at Urbana-Champaign

10:36AM
Low Carbon Manufacturing of Multifunctional Ceramics

Technical Presentation: IMECE2023-113862
Ruochen Liu - Texas A&M University
Jingjing Qiu - Texas A&M University
Shiren Wang - Texas A&M University

10:57AM
Interparticle AFM Force Measurements for Ceramics AM Applications

Technical Presentation: IMECE2023-119968
Brian Bush - National Institute of Standards and Technology

11:18AM
Multiphysics Approach to Predict Fatigue Behavior of High Strength Aluminum Alloy Repaired via Solid-State Additive Manufacturing

Technical Presentation: IMECE2023-120566
Nick Payla - Baylor University
Paul Allison - Baylor University
J.B. Jordan - Department of Mechanical Engineering, The University of Alabama

03-08-01: Computational Modeling and Simulation for Advanced Manufacturing
10/31/2023
10:15AM–12:00PM – Room 262

10:15AM
Design for Additive Manufacturing (DfAM) Paradigm in Robotic Manufacturing of Composite Laminates: An Exemplar Problem Using Steered Fiber Paths

Technical Presentation: IMECE2023-119328
Avin Krishnan Ambika Vijayachandran - University of Michigan
Anthony Woos - University of Michigan
TECHNICAL SESSIONS

10:36AM
Experimental and Numerical Analysis on Additive Manufacturing of Construction and Demolition Waste-Based Geopolymer Material

Technical Presentation: IMECE2023-119545
Ramsha Imran - Hamad Bin Khalifa University
Ans Al Rashid - Hamad Bin Khalifa University
Shoukat Alim Khan - Texas A&M University at Qatar
Muammer Koç - Hamad Bin Khalifa University

10:57
Numerical Simulation of Rotary Friction Welding of a Titanium Alloy

Technical Paper Publication: IMECE2023-110852
Wenxue Chen - Northwestern Polytechnical University
Yaxin Xu - Northwestern Polytechnical University
Achilles Vairis - University of West Attica
Alexander Bikmeyev - Northwestern Polytechnical University
Wenya Li - Northwestern Polytechnical University

11:18AM
Structural Simulation, Structural Optimization, and Winding Sequence Optimization Strategies for the Design and Fabrication of Coreless Filament Wound Composite Lattices

Technical Paper Publication: IMECE2023-110952
Yaru Mo - Shanghai Jiao Tong University
Siwei Ye - Shanghai Jiao Tong University
Shane Johnson - Shanghai Jiao Tong University

11:39AM
A Finite Element Modeling Approach to Dwell Time Optimized Maraging 250 Parts for Wire Arc Directed Energy Deposition

Technical Paper Publication: IMECE2023-111920
Matthew Register - Mississippi State University
Logan Betts - Mississippi State University
Matthew Priddy - Mississippi State University

03-01-06: 7th Annual Conference-Wide Symposium on Additive Manufacturing: Advances
10/31/2023
2:00PM–3:45PM – Room 261

2:00PM
Multiscale Study on Fused Deposition Modeling and Stereolithography 3D Printed Parts: How to 3D Print Better?

Technical Paper Publication: IMECE2023-114519
Andrew O’donohue - Widener University
Ryan Mendenhall - Widener University
Kamran Fouladi - Widener University
Babak Eslami - Widener University

2:21PM
Impact of Channel Shape and Process Parameters on Fluid Flow in Internal Channels of Material Extrusion Parts

Technical Paper Publication: IMECE2023-114000
Ryan Van Domelen - University of St. Thomas
John Wentz - University of St. Thomas
Thomas Shepard - University of St. Thomas
## TECHNICAL SESSIONS

### 2:42PM

**A Slicing Method for Spherical Additive Manufacturing**

*Technical Paper Publication: IMECE2023-113853*

Christopher Kim - Johns Hopkins University  
Levi Devries - United States Naval Academy  
Michael Kutzer - United States Naval Academy

### 3:03PM

**Toward Additive Manufacturing of Architected Materials: A Planar Analysis**

*Technical Paper Publication: IMECE2023-113456*

Jitian Liu - Johns Hopkins University  
Mehran Armand - Johns Hopkins University  
Michael Kutzer - U.S. Naval Academy

### 3:24PM

**Enhanced Energy Dissipation of 3D Printed Liquid Crystal Elastomers and Their Material Structures**

*Technical Presentation: IMECE2023-120070*

Kai Yu - University of Colorado Denver

### 03-08-02: Computational Modeling and Simulation for Advanced Manufacturing

10/31/2023  
2:00PM–3:45PM – Room 262

### 2:00PM

**Computational Modeling of Extreme Particles Deformation and Grain Refinement During Cold Spray Deposition**

*Technical Paper Publication: IMECE2023-112993*

Abba Abubakar - King Fahd University of Petroleum and Minerals  
Khaled Al-Athel - King Fahd University of Petroleum and Minerals  
Syed Akhtar - King Fahd University of Petroleum and Minerals

### 2:21PM

**Computational Analysis of the Compressive Behavior of TPMS Graded Lattice Structures Versus Primitive TPM Lattice Structures Produced by Additive Manufacturing**

*Technical Paper Publication: IMECE2023-113259*

Ahmed Abdelaal - King Fahd University of Petroleum and Minerals  
Khaled Al-Athel - King Fahd University of Petroleum and Minerals  
Abba Abubakar - King Fahd University of Petroleum and Minerals  
Usman Ali - King Fahd University of Petroleum and Minerals  
Syed Sohail Akhtar - King Fahd University of Petroleum and Minerals
2:42PM
Effect of Internal Structure on Warpage in a Large-Scale Additive Manufacturing Process With Bio-Derived Composites

Technical Paper Publication: IMECE2023-114142
Eonyeon Jo - The University of Tennessee Knoxville
Katie Copenhaver - Oak Ridge National Laboratory
Deepak Kumar Pkkalla - Oak Ridge National Laboratory
Tyler Smith - Oak Ridge National Laboratory
Uday Vaidya - The University of Tennessee Knoxville
Vlastimil Kunc - Oak Ridge National Laboratory
Soydan Ozcan - Oak Ridge National Laboratory
Seokpum Kim - Oak Ridge National Laboratory

3:03PM
Comparison of Machine Learning Models and Analytical Scaling Law for Predicting Melt-Pool Depth in Laser Powder Bed Fusion (LPBF) Additive Manufacturing

Technical Paper Publication: IMECE2023-114152
Feiyang Bai - University of the District of Columbia
Siva Surya Prakash Reddy Arikatla - University of the District of Columbia
Nian Zhang - University of the District of Columbia
Fisseha Gebre - University of the District of Columbia
Jiajun Xu - University of the District of Columbia

3:24PM
Utilizing Relative Frequency Shift for Defect Detection and Localization in Additively Manufactured Parts: An Analytical Methodology

Technical Paper Publication: IMECE2023-115043
Quin Howell - California State University, Chico
Joshua Davis - California State University, Chico
Ennio Perez - California State University, Chico
Joseph Mitchell - California State University, Chico
Stewart Lamon - California State University, Chico
Dennis O’Connor - California State University, Chico

03-01-05: 7th Annual Conference-Wide Symposium on Additive Manufacturing: Processing
10/31/2023
4:00PM–5:45PM – Room 261

4:00PM
Unraveling Process-Microstructure Linkage in Additive Friction Stir Deposition of Magnesium Alloy: Numerical Modeling and Experiments

Technical Presentation: IMECE2023-112669
Shashank Sharma - University of North Texas
Kv Mani Krishna - University of North Texas
Sameehan S. Joshi - University of North Texas
Ramakrishna Koganti - University of North Texas
Radhakrishnan Madhavan - University of North Texas
Raj Banerjee - University of North Texas
Narendra B. Dahotre - University of North Texas

4:21PM
High-Throughput Printing of Combinatorial Materials From Aerosols

Technical Presentation: IMECE2023-120345
Yanliang Zhang - University of Notre Dame
TECHNICAL SESSIONS

4:42PM
Identification Method of Constitutive Material Parameters for Additively Manufactured Structures Using an Inverse Optimization Strategy

Technical Paper Publication: IMECE2023-113315
Konstantinos - Ioannis Andrikopoulos - University of West Attica
George Voerakos - University of West Attica
Andreas Marios Tsains - University of West Attica
George Papazafeiropoulos - National Technical University of Athens
Constantinos Stergiou - University of West Attica
Achilles Vairis - University of West Attica

5:03PM
An Investigation of the Effect of Layer-Building Time on the Interlayer Adhesion Strength in Polymer Additive Manufacturing

Technical Paper Publication: IMECE2023-111894
Faisal J. Alzahrani - King Abdulaziz University
Hussam Noor - Taibah University
John P. Coulter - Lehigh University

5:24PM
An Experimental Investigation of Printing Speed, Layer Thickness, and Nozzle Temperature on the Mechanical Properties of Pla-Printed Specimens.

Technical Presentation: IMECE2023-119453
Razaul Islam - Prairie View A&M University
Jaejong Park - Prairie View A&M University

03-06-02: Advanced Material Forming – Mechanism, Characterization, Novel Processes, and Control
10/31/2023
4:00PM–5:45PM – Room 262

4:00PM
Improvements to a Friction Stir Extrusion Machine

Technical Paper Publication: IMECE2023-109994
William Emblom - Emblom Engineering
Ethan Antoine - University of Louisiana at Lafayette
Zachary Dartez - University of Louisiana at Lafayette
John Faucheaux - University of Louisiana at Lafayette
Stephen Hendrix - University of Louisiana at Lafayette
Austin Simon - University of Louisiana at Lafayette
Blake Theriot - University of Louisiana at Lafayette
Paul Darby - University of Louisiana at Lafayette
Scott Wagner - Michigan Technological University

4:42PM
Forming Mechanism of Hollow Shafts With Heavy Section Shrinkage by Multi-Roll Tandem Skew Rolling

Technical Paper Publication: IMECE2023-113215
Song Zhang - Ningbo University
Xuedao Shu - Ningbo University
Zixuan Li - Ningbo University
5:03PM
Hammering-Assisted Incremental Forming of Al Alloy 1050: Assessment of Mechanical and Fracture Properties

Technical Paper Publication: IMECE2023-114093
Harshal Y. Shahare - Indian Institute of Information Technology, Design and Manufacturing, Jabalpur
Abhay Kumar Dubey - Indian Institute of Information Technology, Design and Manufacturing, Jabalpur
Pavan Kumar - Indian Institute of Information Technology, Design and Manufacturing, Jabalpur
Puneet Tandon - Indian Institute of Information Technology, Design and Manufacturing, Jabalpur

5:24PM
Investigating the Material Flow and Thermal Distribution in a Hybrid Additive Manufacturing Incremental Forming (HAMIF) Technology

Technical Paper Publication: IMECE2023-116436
Mithilesh Kumar Tiwari - Indian Institute of Information Technology, Design and Manufacturing, Jabalpur
Ankit Kumar Gupta - Indian Institute of Information Technology, Design and Manufacturing, Jabalpur
Harshal Y. Shahare - Indian Institute of Information Technology, Design and Manufacturing, Jabalpur
K. Ponappa - Indian Institute of Information Technology, Design and Manufacturing, Jabalpur
Puneet Tandon - Indian Institute of Information Technology, Design and Manufacturing, Jabalpur

WEDNESDAY, NOVEMBER 1

03-05-01: 8th Symposium on Fastening and Joining Research and Advanced Technology
11/1/2023
10:45AM–12:30PM – Room 265

10:45AM
A Thorough Characterization Study of the Critical Al-Fin Bond Between the Ni-Resist Insert and Aluminum Base Material in a Heavy-Duty Engine Piston

Technical Paper Publication: IMECE2023-109836
Subha Kumpaty - Milwaukee School of Engineering
Nolan Coen - INNIO Waukesha Gas Engines Inc.
Liam Coen - INNIO Waukesha Gas Engines Inc.

11:06AM
Study of Adhesive Joints Quality Based on Multi-Camera DIC System

Technical Paper Publication: IMECE2023-113687
Bicheng Guo - Oakland University
Zhongfang Gao - Oakland University
Marco Gerini-Romagnoli - Oakland University
Lianxiang Yang - Oakland University

11:27AM
Fastenerless Joining of Carbon Fiber Reinforced Thermoplastic Composite to Aluminum

Technical Paper Publication: IMECE2023-116762
Akash Phadatare - The University of Tennessee Knoxville
Eonyeon Jo - The University of Tennessee Knoxville
Deepak Pokkala - Oak Ridge National Laboratory
Seokpum Kim - Oak Ridge National Laboratory
Uday Vaidya - The University of Tennessee Knoxville
TECHNICAL SESSIONS

11:48AM
Vibration Loosening Performance of Additively-Manufactured Bolted Joints
Technical Paper Publication: IMECE2023-116967
Marco Gerini-Romagnoli - Oakland University
Massimiliano De Agostinis - Università di Bologna
Sayed Nassar - Oakland University
Khushboo Tedlapu - Oakland University

03-07-01: Innovative Product Design and Manufacturing
11/1/2023
10:45AM–12:30PM – Room 266

10:45AM
Design Optimization of Hexacopter Frame Using Generative Design and Additive Manufacturing
Technical Paper Publication: IMECE2023-111791
Thirumal Azhagan M. - Anna University
Ragavanantham Shanmugam - Fairmont State University
Saquib Khan - Maharaja Agrasen Institute of Technology
Surabhi Lata - Maharaja Agrasen Institute of Technology

11:06AM
Analysis of Hydrodynamic Loading on Shark Species to Inform Design of Low Drag Satellite Telemetry Tags
Technical Paper Publication: IMECE2023-113114
Brooke Aduviri - Oregon State University
Bianca Hansen - Oregon State University
Cassandra Wettstein - Oregon State University
Susan Piacenza - Oregon State University
Joseph Piacenza - Oregon State University
Pedro Lomonaco - Oregon State University

11:27AM
Design and Development of Shape Memory Polymer-Based Mechanical Thrombectomy Device
Technical Paper Publication: IMECE2023-113295
Rory O’Brien - Creganna Medical
Vicente Moritz - Technological University of the Shannon, Athlone
Paul Mcdonald - Technological University of the Shannon, Athlone
Declan Devine - Technological University of the Shannon, Athlone
Rupal Srivastava - Technological University of the Shannon, Athlone

11:48AM
Advancement of AM Technology in Development of Personalized In-Vivo and In-Vitro Prosthetic Implants
Technical Paper Publication: IMECE2023-113512
Alex Y - Central Institute of Petrochemical Engineering and Technology
Ragavanantham Shanmugam - Fairmont State University
Monsuru Ramoni - Navajo Technical University
Arup Dey - Navajo Technical University

12:09PM
Development of a Piezoelectric Actuator for an Atomic Force Microscope for Eliminating the Cross-Coupling Effect
Technical Presentation: IMECE2023-119032
Mohammad Amin Ahouei - Wichita State University
Hamid Lankarani - Wichita State University
Mohsen Jafari - Wichita State University
Arian Gerami - Wichita State University
03-12-01: Digital Manufacturing Process Simulation and Validation

11/1/2023
10:45AM–12:30PM – Room 291

10:45AM
Conceptual Architecture of Digital Twin With Human-in-the-Loop-Based Smart Manufacturing

Technical Paper Publication: IMECE2023-112791
Duck Bong Kim - Tennessee Technological University
Mahdi Sadeqi Bajestani - Tennessee Technological University
Guodong Shao - National Institute of Standards and Technology
Albert Jones - National Institute of Standards and Technology
Sang Do Noh - Sungkyunkwan University

11:06AM
Optimizing a Manufacturing Pick-and-Place Operation on a Robotic Arm Using a Digital Twin

Technical Paper Publication: IMECE2023-113101
LaShaundra Perry - Kennesaw State University
David A. Guerra-Zubiaga - Kennesaw State University
Gershom Richards - Georgia Tech Research Institute
Cecil Abidoye - Kennesaw State University
Fadi Hantouli - Kennesaw State University

11:27AM
Digital Twin Based Learning From Demonstration System for Industrial Robots

Technical Paper Publication: IMECE2023-113240
Yevhen Bondarenko - Tallinn University of Technology
Simone Luca Pizzagalli - Tallinn University of Technology
Vladimir Kuts - Tallinn University of Technology
Eduard Petlenkov - Tallinn University of Technology
Tauno Otto - Tallinn University of Technology

11:48AM
Soft Sensor Digital Twin Implementation of a Pick-and-Place Operation

Technical Paper Publication: IMECE2023-113990
Brandon Schrader - Kennesaw State University
David A. Guerra-Zubiaga - Kennesaw State University
Grayson Mcmichael - DataSeers

12:09 PM
Intelligent Facade Innovation (IFI): Using IIoT, Digital Twin, and Next-Gen Architecture Designs

Technical Paper Publication: IMECE2023-113117
Diana Salamaga - Kennesaw State University
David Guerra-Zubiaga - Kennesaw State University
Razvan Voicu - Kennesaw State University
TECHNICAL SESSIONS

03-01-04: 7th Annual Conference-Wide Symposium on Additive Manufacturing: Applications
11/1/2023
2:00PM–3:45PM – Room 265

2:00PM
Direct Numerical Simulation of Additively Manufactured Foam Replacement Structures

Technical Presentation: IMECE2023-112742
Craig Hamel - Sandia National Laboratories
Kevin Long - Sandia National Laboratories
Ryan Smith - Sandia National Laboratories
Adam Cook - Sandia National Laboratories

2:42PM

Technical Presentation: IMECE2023-111729
David Failla - Mississippi State University
S. Caleb Foster - Texas A&M University
Wilson Martinez Diaz - Mississippi State University
Matthew Priddy - Mississippi State University

3:03PM
Transformative High Temperature, High Pressure Compact Heat Exchanger for sCO2 Powder Generation Systems by a New Additive Manufacturing

Technical Presentation: IMECE2023-112785
Haseung Chung - Michigan State University
Zhiyuan Qu - Michigan State University
Patrick Kwon - Michigan State University
Andre Benard - Michigan State University

3:24PM
Design and Development of a Low-Cost Prosthetic Leg for Below-Knee Amputations

Technical Paper Publication: IMECE2023-112039
Shanmuga Sundaram Karibeeran - Anna University
Pradeep Kumar Murugesan - Anna University
Jebin Jayakumar - Anna University
TECHNICAL SESSIONS

11/1/2023
2:00PM–3:45PM – ROOM 266

2:00PM
Using Electrical Resistance as a Diagnostic During Process-Structure-Property Investigation of CNT Forests

Technical Paper Publication: IMECE2023-114379
Ramakrishna Surya - University of Missouri
Matthew Maschmann - University of Missouri

2:21PM
Carbon Nanotube Forest Cold Cathodes for Field Emission in High Power Radiofrequency Sources

Technical Presentation: IMECE2023-113812
Elizabeth Bellott - University of Missouri-Columbia
Connor Gunter - University of Missouri-Columbia
Scott Kovaleski - University of Missouri-Columbia
Brandon Weatherford - SLAC National Accelerator Laboratory
Matthew Maschmann - University of Missouri-Columbia

2:42PM
Nanostructures of Conjugated Poly(3-Alkylthiophene) in Airbrushed Mechano-Optoelectronic Thin Films

Technical Presentation: IMECE2023-111123
Donghyeon Ryu - New Mexico Institute of Mining and Technology
Kyungtae Kim - Los Alamos National Laboratory
Youngmin Lee - New Mexico Institute of Mining and Technology
3:03PM
3D Printed Diffraction Gratings by Two-Photon Polymerization

Technical Paper Publication: IMECE2023-113576
Junyu Hua - Purdue University
Yujie Shan - Purdue University
Shaocheng Wu - Purdue University
Huachao Mao - Purdue University

3:24PM
Research on Integrated Forming Process of Flange Nuts by Three-Roll Skew Rolling and Piercing

Technical Paper Publication: IMECE2023-114892
Siyuan Chen - Ningbo University
Fei Lin - Ningbo University
Xuedao Shu - Ningbo University
Zixuan Li - Ningbo University
Haijie Xu - Ningbo University
Jinrong Zuo – Ningbo University
Ying Wang - Ningbo University
Yimin Deng - Ningbo University

03-12-02: DIGITAL MANUFACTURING PROCESS SIMULATION AND VALIDATION
11/1/2023
2:00PM–3:45PM – ROOM 291

2:00PM
Simulation and Validation of Material Handling and Packaging Processes Using Vision-Guided Virtual and Physical Robots

Technical Paper Publication: IMECE2023-113159
Seth Mascaro - Western New England University
Alexander Mueninghoff - Western New England University
Vedang Chauhan - Western New England University
David Guerra-Zubiaga - Kennesaw State University

2:21PM
Digital Twin Approach to Support Preventative Maintenance in a Robotic Application

Technical Paper Publication: IMECE2023-113291
Joshua Clounie - Kennesaw State University
David A. Guerra-Zubiaga - Kennesaw State University
Razvan Cristian Voicu - Kennesaw State University

2:42PM
An Adaptive Path Planning Approach for Digital Twin-Enabled Robot Arm Based on Inverse Kinematics and Deep Reinforcement Learning

Technical Paper Publication: IMECE2023-113131
Qi Zhou - Shanghai Jiao Tong University
Sikai Li - Shanghai Jiao Tong University
Jingbo Qu - Shanghai Jiao Tong University
Jin Wu - Shanghai Jiao Tong University
Haomiao Xu - Shanghai Jiao Tong University
Youyi Bi - Shanghai Jiao Tong University
TECHNICAL SESSIONS

3:03PM

Next-Generation Automation: Development and Simulation of an Autonomous Sorting System

Technical Paper Publication: IMECE2023-114297
Francisco Koe - Kennesaw State University
David Guerra-Zubiaga - Kennesaw State University
Lashaundra Perry - Kennesaw State University
Vedang D. Chauhan - Western New England University
Germanico Gonzalez-Badillo - Universidad Autónoma de San Luis Potosí

3:24PM

A Framework for In-Situ Vision Based Detection of Part Features and Its Single Layer Verification for Additive Manufacturing

Technical Paper Publication: IMECE2023-113763
Tushar Saini - The University of Texas at Arlington
Panos Shiakolas - The University of Texas at Arlington

03-02-01: CONGRESS-WIDE SYMPOSIUM ON NDE & SHM: MEASUREMENT SCIENCE, SENSORS, AND PROCESS MONITORING AND CONTROL FOR ADVANCED MANUFACTURING
11/1/2023
4:00PM–5:45PM – ROOM 265

4:00PM

Condition Monitoring of Cutting Tools by Feature Analysis of Vibro-Acoustic Sensing Signals

Technical Paper Publication: IMECE2023-112025
Dongjing Lao - University of Michigan–Shanghai Jiao Tong University Joint Institute
Yanfeng Shen - University of Michigan–Shanghai Jiao Tong University Joint Institute

4:21PM

Automatic Evaluation of Inline Surface Topology Measurement Data of Material Jetted Metal Parts for Closed Loop Control

Technical Paper Publication: IMECE2023-112380
Christoph Rehekampff - Technical University of Munich
Markus Huber - Technical University of Munich
Benedikt Kirchebner - Technical University of Munich
Franz Irlinger - Technical University of Munich
Tim C. Lueth - Technical University of Munich
**TECHNICAL SESSIONS**

**4:42PM**

Vision-Based Tool Wear Classification During End-Milling of Inconel 718 Using a Pre-Trained Convolutional Neural Network

Technical Paper Publication: IMECE2023-113344
Aitha Sudheer Kumar - Indian Institute of Technology Jodhpur
Ankit Agarwal - Clemson University
Vinita Gangaram Jansari - Clemson University
K.A. Desai - Indian Institute of Technology Jodhpur
Chiranjoy Chattopadhyay - FLAME University
Laine Mears - Clemson University

**5:03PM**

A Study on Compressed Air Flow Measurement for Industrial Energy Efficiency Enhancement

Technical Paper Publication: IMECE2023-113380
Miles Nevills - Tennessee Technological University
Ethan Languri - Tennessee Technological University

**5:24PM**

Numerical Study of Distributed Acoustic Sensing (DAS) for Railway Condition Monitoring

Technical Paper Publication: IMECE2023-112954
Michael Jones - Georgia Southern University
Md Arifur Rahman - Georgia Southern University
Mohammad Taheri - South Dakota State University
Hossein Taheri - Georgia Southern University

**03-09-01: VARIATION SIMULATION AND DESIGN FOR ASSEMBLY**

11/1/2023
4:00PM–5:45PM – ROOM 266

**4:00PM**

Research on Robotic Online Inspection Process Planning Based on 3D Environment Reconstruction

Technical Presentation: IMECE2023-118750
Yinhua Liu - University of Shanghai for Science and Technology

**4:21PM**

A Manufacturing Compensation Method as Applied to CFRP Components in Aero Engines

Technical Paper Publication: IMECE2023-113422
Johan Lööf - GKN Aerospace
Andrew Frampton - GKN Aerospace
Kristina Wärmejord - Chalmers University of Technology
Rikard Söderberg - Chalmers University of Technology
THURSDAY, NOVEMBER 2

03-10-01: ROBOTICS AND AUTOMATION IN ADVANCED MANUFACTURING
11/2/2023
10:15AM–12:00PM – ROOM 266

10:15AM
Motion Control of a Robot by Means of Q-Learning Using the Example of Locomotion
Technical Paper Publication: IMECE2023-111287
Tobias Bussmann - University of Applied Sciences Bochum
Daniel Schilberg - University of Applied Sciences Bochum

10:36AM
Mobile Robot With Robotic Arm: Development and Validation of a Digital Twin
Technical Paper Publication: IMECE2023-113056
Laura Salamina - Politecnico di Torino
Matteo Gaidano - Politecnico di Torino
Matteo Melchiorre - Politecnico di Torino
Stefano Mauro - Politecnico di Torino

10:57AM
A Robot Motion Planning Approach Based on Adaptive Multi-Tree Sampling
Technical Paper Publication: IMECE2023-113127
Bohan Feng - Shanghai Jiao Tong University
Xinting Jiang - Shanghai Jiao Tong University
Youyi Bi - Shanghai Jiao Tong University

5:03PM
Primary and Secondary Datum Planes Using Constrained Least Squares as an Efficient, Robust Solution for Standardization
Technical Paper Publication: IMECE2023-117014
Craig Shakarji - National Institute of Standards and Technology
Vijay Srinivasan - National Institute of Standards and Technology

5:24PM
Digital Geometry Assurance Process for Enhanced Manufacturing Efficiency: A Step Towards Industry 4.0
Technical Presentation: IMECE2023-119716
Rikard Söderberg - Chalmers University of Technology
Kristina Wärmejord - Chalmers University of Technology

4:42PM
A New Deviation Propagation Model Combining Dimensional Deviation and Welding Deformation of Panel Structures With High Local Stiffness
Technical Paper Publication: IMECE2023-112739
Chang Gao - Shanghai Jiao Tong University
Haidong Yu - Shanghai Jiao Tong University
Bin Gu - Shanghai Jiao Tong University
<table>
<thead>
<tr>
<th>Time</th>
<th>Session Title</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>11:39AM</td>
<td>A Framework for Human-Robot Teaming Performance Prediction: Reinforcement Learning and Eye Movement Analysis</td>
<td>Gustavo Martins Galvani - The University of Alabama, Soroush Korivand - Southern Methodist University, Arash Ajoudani - Istituto Italiano di Tecnologia, Jiaqi Gong - The University of Alabama, Nader Jalili - Southern Methodist University</td>
</tr>
<tr>
<td>10:15AM</td>
<td>Plasma Interaction and Dynamic Monitoring of Hybrid Laser-Arc Welding of Large-Length Continuous Welds in Large Cruise Ships</td>
<td>Liangfeng Li - Shanghai Jiao Tong University, Jie Shen - Shanghai Ocean University, Yansong Zhang - Shanghai Jiao Tong University</td>
</tr>
<tr>
<td>10:57AM</td>
<td>Research on Welding Quality Optimization of Ultra-High Strength Steel Welding Joint Under Different Laser Energy Inputs</td>
<td>Siliang Li - Tongji University, Heng Zhang - Tongji University, Xuanjun Pan - Tongji University, Qian Wang - Tongji University, Haijiang Liu - Tongji University</td>
</tr>
<tr>
<td>11:18AM</td>
<td>Enhancing Sample Efficiency for Temperature Control in DED With Reinforcement Learning and MOOSE Framework</td>
<td>Joao Sousa - Instituto Nacional de Estadística y Geografía, Roya Darabi - Universidade do Porto, Armando Sousa - Universidade do Porto, Luis Reis - Universidade do Porto, Frank Brueckner - Fraunhofer IWS, Ana Reis - Instituto Nacional de Estadística y Geografía, Jose Cesar De Sa - Universidade do Porto</td>
</tr>
</tbody>
</table>
TECHNICAL SESSIONS

11:39AM
Process Optimization and Effect of Intrinsic Heat Treatment on Properties of Laser Metal Deposited Structures

Technical Paper Publication: IMECE2023-114191
Tianci Li - Beijing University of Technology
Dongyun Zhang - Beijing University of Technology
Lele Zhang - Beijing Jiaotong University
Geng Chen - Beijing Jiaotong University
Thomas Schophoven - Fraunhofer Institute for Laser Technology
Andres Gasser - Fraunhofer Institute for Laser Technology
Reinhart Poprawe - Fraunhofer Institute for Laser Technology

11:50AM
Preliminary Development of a High-Throughput Approach to Calibrate Finite Element Heat Sources for Wire Arc Directed Energy Deposition

Technical Presentation: IMECE2023-111698
Logan Betts - Mississippi State University
Matthew Register - Mississippi State University
Matthew Priddy - Mississippi State University

11:18AM
Challenges in Geometry Assurance of Megacasting

Technical Presentation: IMECE2023-119587
Kristina Waermefjord - Chalmers University of Technology
Rikard Soederberg - Chalmers University of Technology

11:39AM
Robust Contact Modeling in Non-Rigid Variation Simulation

Technical Paper Publication: IMECE2023-113280
Roham Sadeghi Tabar - Chalmers University of Technology
Samuel Lorin - Chalmers University of Technology
Lars Lindkvist - Chalmers University of Technology
Kristina Wärmefjord - Chalmers University of Technology
Rikard Söderberg - Chalmers University of Technology

TECHNICAL SESSIONS

03-16-02: MANUFACTURING: GENERAL
11/2/2023
10:15AM–12:00PM – ROOM 289

10:15AM
Investigation of Magnetic Field-Assisted Stereolithography 3D Printed Functionally Graded Materials

Technical Presentation: IMECE2023-113668
John Shelton - Northern Illinois University
Joseph Panzica - Northern Illinois University
Robert Sinko - Northern Illinois University

10:36AM
Process Parameters Optimization in 3D Printing of Metallic Parts

Technical Presentation: IMECE2023-109591
Khalil Khanafar - University of Michigan
Ali Al-Masri - Australian University - Kuwait
Joon Soo Park - University of Michigan
TECHNICAL SESSIONS

03-11-02: LASER-BASED ADVANCED MANUFACTURING AND MATERIALS PROCESSING
11/2/2023
2:00PM–3:45PM – ROOM 265

2:00PM
Development of Sub-Surface Laser Additive Manufacturing Process for Liquid Resins

Technical Paper Publication: IMECE2023-113748
Patrick Riggs - Georgia Southern University
Julio Silva - Georgia Southern University
Rafael Quirino - Georgia Southern University
Hossain Ahmed - Georgia Southern University

2:21PM
A Study on Surface Texture and Wettability of Femtosecond Laser Treated Aluminum Alloy

Technical Paper Publication: IMECE2023-114306
Dakota Angell - Kansas State University
Xinya Wang - Kansas State University
Xiaoxu Song - Kansas State University
Shuting Lei - Kansas State University

2:42PM
Effect of Laser Power and Diamond Tool Parameters for Micro Laser-Assisted Ductile Mode Material Removal on Fused Silica

Technical Paper Publication: IMECE2023-114678
Hassan Shrizadi Jahromi - Western Michigan University
Hossein Mohammadi - Western Michigan University
Sai K. Kode - Micro-Lam Inc.
Jonathan D. Ellis - Micro-Lam Inc.
Deepak Ravindra Menon - Micro-Lam Inc.

3:03PM
In-Process Orbiting Laser-Assisted Polymer 3D Printing: A Rival for Injection Molding

Technical Presentation: IMECE2023-114364
Pu Han - Arizona State University
Keng Hsu - Arizona State University

3:24PM
Development of Artificially Tuned Microstructure Using Interpenetrating Lattices Fabricated by Laser Powder Bed Fusion

Technical Presentation: IMECE2023-114736
Bharath Bhushan Ravichander - The University of Texas at Dallas
Golden Kumar - The University of Texas at Dallas

03-13-01: CONFERENCE-WIDE SYMPOSIUM ON BIOMEDICAL MANUFACTURING & MATERIALS
11/2/2023
2:00PM–3:45PM – ROOM 266

2:00PM
Novel Biocompatible Material Formulations for 3D-Microfabrication of Porous Scaffolds for Bone Regenerative Engineering

Technical Paper Publication: IMECE2023-110404
Ryan Webb - Marshall University
Katie Legg - Marshall University
Hamzeh Al-Qawasmi - Marshall University
Nadja Spitzer - Marshall University
Roozbeh (Ross) Salary - Marshall University
TECHNICAL SESSIONS

2:42PM
Investigation of the Influence of Nylon-6 versus Nylon-66 on the Mechanical Performance of Composite Bone Tissue Scaffolds
Technical Paper Publication: IMECE2023-110405
Brandon Coburn - Marshall University
Robert Joyce - FibreTuff
Roozbeh (Ross) Salary - Marshall University

3:03PM
3D Bioprinting of Engineered Full-Scale Human Tissues and Organs
Technical Presentation: IMECE2023-114989
Yifei Jin - University of Nevada

3:24PM
Molybdenum Disulfide Solid-State Nanopores for Single-Molecule Biosensing
Technical Paper Publication: IMECE2023-116801
Jugal Saharia - The University of Texas Permian Basin
Y.M. Nuwan D.Y. Bandara - The Australian National University
Lokesh Saharan - The University of Texas Permian Basin

03-02-02: CONGRESS-WIDE SYMPOSIUM ON NDE & SHM: MEASUREMENT SCIENCE, NON-DESTRUCTIVE EVALUATION (NDE) AND PROCESS MONITORING FOR ADVANCED MANUFACTURING
11/2/2023
4:00PM–5:45PM – ROOM 264

4:00PM
Development of Real-Time Defect Detection Techniques Using Infrared Thermography in the Fused Filament Fabrication Process
Technical Paper Publication: IMECE2023-113751
Asef Ishraq Sadaf - Georgia Southern University
Hossain Ahmed - Georgia Southern University
Md Arif Iqbal Khan - Georgia Southern University
Hayri Sezer - Georgia Southern University

4:21PM
The Ultrasonic Testing Approach for In-Situ Monitoring of the Fused Deposition Modeling Process
Technical Paper Publication: IMECE2023-114006
Mariya Pozhanka - New Mexico Institute of Mining and Technology
Celeste Flores - New Mexico Institute of Mining and Technology
Caleb Crosswhite - New Mexico Institute of Mining and Technology
Zane Stevens - New Mexico Institute of Mining and Technology
Aidan Vig - New Mexico Institute of Mining and Technology
Noah Trudell - New Mexico Institute of Mining and Technology
Andrei Zagrai - New Mexico Institute of Mining and Technology
4:42PM

Phased Array Ultrasonic Nondestructive Testing for Mechanical Integrity Assessment of Steel Welding

Technical Paper Publication: IMECE2023-113110
Caleb Williams - Georgia Southern University
Mohammad Taheri - South Dakota State University
Hossein Taheri - Georgia Southern University

5:03PM

Characterizing Physical Change in Post-Processed Additively Manufactured Parts Through Full Waveform Inversion

Technical Presentation: IMECE2023-119649
John Day - The University of Alabama
Jiaze He - The University of Alabama
Md Aktharuzzaman - The University of Alabama
Erin Lanigan - NASA Marshall Space Flight Center
Delphine Duquette - NASA Marshall Space Flight Center
Colton Katsarelis - NASA Marshall Space Flight Center
Diana Andreev - NASA Marshall Space Flight Center
Jeffrey Shragge - Colorado School of Mines
Paul Sava - Colorado School of Mines

5:24PM

Using Local Concentration to Model the Progress of Acoustophoretic Assembly of Microspheres in Planar Standing Waves

Technical Paper Publication: IMECE2023-112310
Y. Jenny Wang - Massachusetts Institute of Technology
Brian Anthony - Massachusetts Institute of Technology

03-11-03: LASER-BASED ADVANCED MANUFACTURING AND MATERIALS PROCESSING
11/2/2023
4:00PM–5:45PM – ROOM 265

4:00PM

Additively Manufactured Inconel 625 Subjected to Shot and Laser Peening: Microstructural, Surface Integrity and Fretting Wear Analyses

Technical Presentation: IMECE2023-115034
Manisha Triaprthy - George Mason University
Lloyd Hackel - Curtiss Wright Surface Technologies - Metal Improvement Company
Keivan Davami - The University of Alabama
Ali Beheshti - George Mason University

4:21PM

The Effects of Laser Peening on Fatigue Properties of Friction Stir Welded Aluminum Alloy 6061

Technical Presentation: IMECE2023-116878
Russell Rowe - The University of Alabama
Keivan Davami - The University of Alabama

4:42PM

Strengthening Mechanisms in Laser Peened and Thermally Engineered Additively Manufactured Nickel-Based Superalloys

Technical Presentation: IMECE2023-116987
Keivan Davami - The University of Alabama
Alireza Doroudi - The University of Alabama
Lloyd Hackel - Curtiss Wright Surface Technologies
5:03PM
Femtosecond Laser Sintering of Ti Nanoparticles

Technical Presentation: IMECE2023-120355
Janghan Park - The University of Texas at Austin
Yaguo Wang - The University of Texas at Austin

03-16-03: MANUFACTURING: GENERAL
11/2/2023
4:00PM–5:45PM – ROOM 289

4:00PM
Realization of Production-Capable, Industry-Grade Manufacturing Systems for Advanced Manufacturing Engineering Programs

Technical Presentation: IMECE2023-118862
Daniel Cox - Georgia Southern University

4:21PM
Adaptive Control of Curved Ship Blocks Welding Process Using Laser Active Vision System

Technical Paper Publication: IMECE2023-114651
Sen Zhang - Shanghai Jiao Tong University
Liangfeng Li - Shanghai Jiao Tong University
Yansong Zhang - Shanghai Jiao Tong University

4:42PM
Roll-to-Roll Fabrication of Antimicrobial Textiles by Polydopamine-Assisted Electroless Plating

Technical Presentation: IMECE2023-119666
Ho Kun Woo - University of Illinois at Urbana-Champaign
Aman Mehta - University of Illinois at Urbana-Champaign
Alex Karrow - University of Illinois at Urbana-Champaign
Ronan Looney - University of Illinois at Urbana-Champaign
Lili Cai - University of Illinois at Urbana-Champaign

5:03PM
Classifying Human Thermal Images Using Deep Learning Technique in Artificial Intelligence

Technical Paper Publication: IMECE2023-109647
Sathish Kumar Gurupatham - Kennesaw State University
Ujjwal Purimetla - Kennesaw State University
Kaliga Kumar - Georgia Tech
Track 4: Advanced Materials: Design, Processing, Characterization, and Applications

Topics:
4-1: Mechanics of Design, Processing, and Performance of Heterogeneous Composites
4-2: Material Processing of Flexible/Emerging Electronics, Sensors, and Devices
4-3: Mechanical Metamaterials
4-4: Multiscale Models and Experimental Techniques for Composite Materials and Structures
4-5: Materials Processing and Characterization
4-6: Nanoengineered, Nano Modified, Hierarchical, Multi-Scale Materials, and Structures
4-7: Process Development, Characterization, and Optimization for Additive, Subtractive, and Hybrid Manufacturing
4-8: Design of Engineered Materials and Components for Additive Manufacturing
4-9: Design of Engineering Materials
4-10: Manufacturing, Integration and Characterization of Multifunctional Structure and Devices
4-11: Architected Composites and Structures: Design for Multifunctionality
4-12: Materials for Biomedical Devices and Medications in Healthcare
4-13: Artificial Intelligence and Machine Learning in Biomedical Material Design
4-14: Active Materials for Bioinspired and Biomimetic Applications
4-15: Thin-Film Materials/Electronics for Advanced Biochemical and Biophysical Sensing
4-16: Multifunctional Intelligent Materials and Systems
4-17: Manufacturing, Integration, and Characterization of Multifunctional Structure and Devices
4-18: Bioinspired Materials, Structures, and Applications
4-19: Modeling, Simulation, and Design of Multifunctional Materials
4-20: Dynamics of Advanced Functional Materials and Structures
4-21: Printed Hybrid Multifunctional Electronics and Energy Devices
4-22: Electric Vehicle Batteries as Multifunctional Energy Storages
4-23: Mechanics and Materials of Soft/Flexible/Stretchable Electronics
4-24: Applications of Artificial Intelligence and Machine Learning for Manufacturing Process Optimization
4-25: Modeling and Experimentation of Geomaterials
4-26: Integrated Computational Materials Engineering (ICME) Mini-Symposium
4-27: Mechanics of Penetration, Shockwaves, and High-Strain-Rate Events: Modeling and Experiments
4-28: Modeling and Experiments in Nanomechanics and Nanomaterials
4-29: Manufacturing of Polymers and Polymer-Matrix Composites: Experiments and Simulations
4-30: Fluid Dynamics Effects in Materials Processing and Advanced Manufacturing
4-30: Novel Verification, Validation, and Uncertainty Quantification (VVUQ) Techniques and Approaches for Advanced Materials Applications

ACKNOWLEDGMENT

TRACK ORGANIZERS
Track Organizer: Hanqing Jiang
Track Co-Organizer: Curt Bronkhorst, University of Wisconsin-Madison

TOPIC ORGANIZERS:
Abiodun Fasoro
Adrian Sabau
Ahsan Mian, Wright State University
Akio Yonezu, Chuo University
Ali Ashraf, The University of Texas Rio Grande Valley
Andrew Bowman, U.S. Army Engineer Research and Development Center
Andrew Gaynor, U.S. Army Research Laboratory
Anil Saigal, Tufts University
Baoxing Xu, University of Virginia
TECHNICAL SESSIONS

Bo Li, Villanova University
Caglar Oskay, Vanderbilt University
Changhong Cao, Case Western Reserve University
Cunjiang Yu, The Pennsylvania State University
Daeha Joung
Dianyun Zhang, Purdue University
Elham Sahraei, Temple University
Fang Yang
Feng Zhu, Johns Hopkins University
Feruza Amirkulova, San Jose State University
George Z. Voyiadjis, Louisiana State University
Jaehyung Ju, Shanghai Jiao Tong University
Jeffrey Kysar
Jianliang Xiao, University of Colorado Boulder
Jinghua Li, The Ohio State University
Jong Eun Ryu, North Carolina State University
Jordan R. Raney, University of Pennsylvania
Jun Li, University of Massachusetts Dartmouth
Jun Xu, The University of North Carolina at Charlotte
Kedar Kirane, Stony Brook University
Kelvin Fu
Kevin Dowding, Sandia National Laboratories
Kishore Pochiraju
Lin Zhang, Utah State University
Ling Liu, Temple University
Majid Minary, The University of Texas at Dallas
Mei Chandler, U.S. Army Engineer Research and Development Center
Michelle Pagano, ASME
Mir Jalil Razavi
Mohammadreza Yaghoobi, University of Michigan
Natasha Vermaak, Lehigh University
Pilgyu Kang, George Mason University
Prahit Dubey, Nikola Motor Company
Raghu Prakash, Indian Institute of Technology Madras
Ram Mohan, North Carolina Agricultural and Technical State University
Renee Zhao, Stanford University
Sara Adibi, Mississippi State University
Seyed Allameh, Northern Kentucky University
Shanshan Yao
Shuodao Wang
Sridhar Santhanam, Villanova University
Sriharsha Srinivas Sundararam
Tian Xia
Travis Shihao Hu, California State University, Los Angeles
Wei Zhao, Oklahoma State University
Weiyi Lu, Michigan State University
Weizhu Yang
William Lawrimore, U.S. Army Engineer Research and Development Center
Xiang Zhang, University of Wyoming
Xianqiao Wang
Xueju Wang, University of Connecticut
Yan Li, Dartmouth College
Yozo Mikata, Fluor
Yuan Gao, University of Illinois
Yue Zhou, The University of Texas at Dallas
Yumeng Li, University of Illinois at Urbana-Champaign
Yunteng Cao
Zhenhai Xia
SESSION CHAIRS:

Abiodun Fasoro
Aditya Kumar, Georgia Institute of Technology
Adrian Sabau
Ahsan Mian, Wright State University
Akio Yonezu, Chuo University
Andrew Bowman, U.S. Army Engineer Research and Development Center
Andrew Gaynor, U.S. Army Research Laboratory
Anil Saigal, Tufts University
Baoning Xu, University of Virginia
Bo Li, Villanova University
Changyong Cao, Case Western Reserve University
Curt Bronkhorst, University of Wisconsin-Madison
Dong Qian, University of Texas at Dallas
Feng Zhu, Johns Hopkins University
Feruza Amirkulova, San Jose State University
George Z. Voyiadjis, Louisiana State University
Hanqing Jiang
Jaehyung Ju, Shanghai Jiao Tong University
Jeffrey Kysar
Jong Ryu, North Carolina State University
Jordan R. Raney, University of Pennsylvania
Jun Li, University of Massachusetts Dartmouth
Jun Xu, The University of North Carolina at Charlotte
Kedar Kirane, Stony Brook University
Kevin Long, Sandia National Laboratories
Kun Fu, University of Delaware
Lin Zhang, Utah State University
Ling Liu, Temple University
Majid Minar, The University of Texas at Dallas
Mei Chandler, U.S. Army Engineer Research and Development Center
Mohammadreza Yaghoobi, University of Michigan
Natasha Vermaak, Lehigh University
Philippe Geubelle, University of Illinois at Urbana-

Champaign
Raghu Prakash, Indian Institute of Technology Madras
Ram V. Mohan, North Carolina A&T University
Ruike Renee Zhao, Stanford University
Sara Adibi, Mississippi State University
Seyed Allameh, Northern Kentucky University
Shanshan Yao, N/A
Sridhar Santhanam, Villanova University
Sriharsha Srinivas Sundaram
Travis Shihao Hu, California State University, Los Angeles
Wei Zhao, Oklahoma State University
Weiyi Lu, Michigan State University
William Lawrimore, US Army Engineer Research and Development Center
Xiang Zhang, University of Wyoming
Xueju Wang, University of Connecticut
Yan Li, Dartmouth College
Yozo Mikata, Fluor
Yumeng Li, University of Illinois at Urbana-Champaign
Yunteng Cao
Zhenhai Xia
TECHNICAL SESSIONS

TRACK 4: ADVANCED MATERIALS:
DESIGN, PROCESSING, CHARACTERIZATION
AND APPLICATIONS
MONDAY, OCTOBER 30

04-07-01: PROCESS DEVELOPMENT, CHARACTERIZATION,
AND OPTIMIZATION FOR ADDITIVE, SUBTRACTION, AND
HYBRID MANUFACTURING
10/30/2023
10:45AM–12:30 PM – ROOM 289

10:45AM
Investigating the Influence of Nanoparticle Size and Loading on Printability of Polymer-Nanoparticle Composite Inks for Direct Ink Writing

Technical Presentation: IMECE2023-120328
Yun Li - Villanova University
Aidan Flynn - Villanova University
Christopher Masternick - Villanova University
Brandon Kolanovic - Villanova University
Bin Li - Wichita State University
Liang Zhao - Villanova University
Mingyuan Sun - Villanova University
Bo Li - Villanova University

11:27AM
Thermal Fluid Behaviors and Morphology Evolution of Molten Pool During Selective Laser Sintering of Inconel 625

Technical Paper Publication: IMECE2023-109482
Bin Xiao - Texas State University
Byoung Hee You - Texas State University
Tongdan Jin - Texas State University

11:48AM
Enhancing the Performance Measures of Electrical Discharge Machining Using Additive Manufactured Copper Tool Electrode on Drilling Titanium Alloy Specimens

Technical Paper Publication: IMECE2023-112922
Ragavananthan Shanmugam - Fairmont State University
Muthuramalingam Thangamani - SRM Institute of Science and Technology
Geethapriyan Thangamani - Indian Institute of Technology Indore
Monsuru Ramoni - Navajo Technical University

12:09PM
Design and Development of Low-Temperature Ni Coating Without Plasma Using Atomic Layer Deposition

Technical Paper Publication: IMECE2023-114158
David Box - University of the District of Columbia
Hayden Brown - University of the District of Columbia
Fisseha Gebre - University of the District of Columbia
Vivek Dwivedi - NASA Goddard Space Flight Center
Jiajun Xu - University of the District of Columbia

11:06AM
Topology Optimization of Fiber Reinforced Structures for Composite Additive Manufacturing With Discrete Orientation

Technical Presentation: IMECE2023-120012
Md Mohaiminul Islam - Temple University
Ling Liu - Temple University
TECHNICAL SESSIONS

04-08-01: DESIGN OF ENGINEERED MATERIALS AND COMPONENTS FOR ADDITIVE MANUFACTURING
10/30/2023
10:45AM–12:30PM – ROOM 291

10:45AM
Strength and Fracture Energy Dependence of Additively Manufactured Polymer Parts on Build Orientation, Density, and Layer Thickness
Technical Paper Publication: IMECE2023-112241
Ankit Ashok - Birla Institute of Technology and Science-Pilani
Srinivasa Prakash Regalla - Birla Institute of Technology and Science-Pilani
Pavan Kumar Penumakala - Birla Institute of Technology and Science-Pilani
Sri Maha Vishnu Polisetty - Birla Institute of Technology and Science-Pilani

11:06AM
On the 3D Printing of Reinforced Concrete
Technical Paper Publication: IMECE2023-112719
Seyed M. Allameh - Northern Kentucky University
Hadi Allameh - Sulair
Roger Miller - Northern Kentucky University
Avery Lenihan - Gatton Academy of Mathematics and Science
Dhruv Kota - Sycamore High School

11:27AM
A Sustainable Solution: Preparation of Nanocellulose Reinforced Brewer’s Spent Grain as a Fully Bio-Based 3D Printable Composite
Technical Paper Publication: IMECE2023-112780
Zainab Al Tamimi - Gannon University
Longyan Chen - Gannon University
Xiaoxu Ji - Gannon University
Davide Piovesan - Gannon University
Allen R. Madura - Gannon University
Jacob Lehotsky - Gannon University

11:48AM
Automated Design of Custom Printed Circuit Board Enclosures With Integrated Cooling Capabilities
Technical Paper Publication: IMECE2023-113510
Felix Pancheri - Technical University of Munich
Yilun Sun - Technical University of Munich
Christoph August Wilhelm Parhofer - Technical University of Munich
Christoph Rehekampff - Technical University of Munich
Dingzhi Zhang - Technical University of Munich
Tim C. Lueth - Technical University of Munich

12:09PM
Investigating the Effects of Acetone Vapor Treatment Conditions and Post Drying Methods on Surface Roughness and Tensile Strength of 3D Printed ABS Components
Technical Paper Publication: IMECE2023-113811
Heechang Alex Bae - Eastern Washington University
Mickenzie Kinney - Eastern Washington University
Tyler Scheff - Eastern Washington University
Matthew Michaelis - Eastern Washington University
Awlad Hossain - Eastern Washington University
04-02-01: MATERIAL PROCESSING OF FLEXIBLE/EMERGING ELECTRONICS, SENSORS, AND DEVICES
10/30/2023
2:00PM–3:45PM – ROOM 289

2:00PM
Pressure Sensors Developed Using Auxetic Structures
Technical Paper Publication: IMECE2023-113213
Brandon Dang - Oklahoma State University
Dong-Chan Lee - Institute for Advanced Engineering
Huaxia Wang - Oklahoma State University
Chulho Yang - Oklahoma State University

2:21PM
Pressure-Sensor-Integrated Smart Bandage for the Management of Diabetic Foot Ulcers
Technical Presentation: IMECE2023-120216
Xueju Wang - University of Connecticut

2:42PM
Mechanical Reliability of Strain Sensors Printed Using Additive/Subtractive Hybrid Fabrication Method
Technical Presentation: IMECE2023-120376
Lemuel Duncan - Wright State University
Roberto Aga - Defense and Intel, KBR Inc.
Carrie Bartsch - Air Force Research Laboratory
Emily Heckman - Air Force Research Laboratory
Ahsan Mian - Wright State University

3:03PM
Graphene- and Paper-Based Biosensors for Small Protein Detection
Technical Presentation: IMECE2023-119900
Ziyad Abouelenin - Rutgers University
Alessia Venturi - Rutgers University
Grace Anderson - Rutgers University
Ibrahim Klobocista - Rutgers University
Akhil Abraham - Rutgers University
Riya Sheth - Rutgers University
Mufan Yu - Rutgers University
Md Ashiqur Rahman - The University of Texas Rio Grande Valley
Ali Ashraf - The University of Texas Rio Grande Valley
Aaron Mazzeo - Rutgers University

3:24PM
Improvement of Sensitivity and Selectivity of Graphene-Based Gas Sensor by Strain
Technical Paper Publication: IMECE2023-112231
Xiangyu Qiao - Tohoku University
Meng Yin - Tohoku University
Ken Suzuki - Tohoku University
Hideo Miura - Tohoku University
04-02-02: MATERIAL PROCESSING OF FLEXIBLE/EMERGING ELECTRONICS, SENSORS, AND DEVICES
10/30/2023
4:00PM–5:45PM – ROOM 289

4:00PM

Soft, Flexible Conductivity Sensors for Ocean Salinity Monitoring

Technical Presentation: IMECE2023-119840
Shao-Hao Lu - University of Connecticut
Xueju Wang - University of Connecticut

4:21PM

Sensitivity Improvement of Graphene-Based Gas Sensors by Direct Growth of Carbon Nanotubes on the Graphene

Technical Paper Publication: IMECE2023-113221
Ken Suzuki - Tohoku University
Yuto Hirose - Tohoku University
Xiangyu Qiao - Tohoku University
Wangyang Fu - Tsinghua University
Hideo Miura - Tohoku University

4:42PM

Soft, Pressure-Tolerant Ocean Sensors for Oceanographic Measurements of Temperature and Pressure

Technical Presentation: IMECE2023-120212
Xueju Wang - University of Connecticut
Yi Li - University of Connecticut
Shao-Hao Lu - University of Connecticut

5:03PM

Salt-Assisted Assembly of MXene on Arbitrary Polymers

Technical Presentation: IMECE2023-120294
Liang Zhao - Villanova University
Lingyi Bi - Drexel University
Jiayue Hu - Temple University
Guanhui Gao - Rice University
Danzhen Zhang - Drexel University
Yun Li - Villanova University
Aidan Flynn - Villanova University
Teng Zhang - Drexel University
Ruocun Wang - Drexel University
Mingyuan Sun - Villanova University
Ling Liu - Temple University
Yury Gogotsi - Drexel University
Bo Li - Villanova University

5:24PM

Direct Ink Writing of Polyisoprene Composites With Reinforcing and Conductive Fillers

Technical Presentation: IMECE2023-112431
James Banks - Texas State University
Anahita Emami - Texas State University
TUESDAY, 10/31/2023

04-01-01: MECHANICS OF DESIGN, PROCESSING, AND PERFORMANCE OF HETEROGENEOUS COMPOSITES
10/31/2023
10:15AM–12:00PM – ROOM 263

10:15AM

Compressive Strength of Unidirectional Carbon Fiber Reinforced Plastics With Large Fiber Diameter

Technical Presentation: IMECE2023-119805
Atsushi Enomoto - Waseda University
Kaku Ikemoto - Waseda University
Naoki Sugiura - Mitsubishi Chemical Corporation
Atsushi Hosoi - Waseda University
Hiroyuki Kawada - Waseda University

10:36AM

Modified Differential Implementation of Mean Field Homogenization Scheme to Model Stochasticity of Stress Fields in Individual Inclusions for Bi-Phase Composites

Technical Presentation: IMECE2023-113415
Deepjyoti Dhar - Indian Institute of Technology Kharagpur
Atul Jain - Indian Institute of Technology Kharagpur

10:57AM

Electro-Mechanical Studies of Multi-Functional Glass Fiber and Carbon Fiber Composites Exposed to Seawater/Freshwater and Cold Temperatures

Technical Paper Publication: IMECE2023-110321
Jacob O’Donnell - Naval Undersea Warfare Center
Paul Cavallaro - Naval Undersea Warfare Center
Michael Smith - Naval Undersea Warfare Center
Nicholas Valm - Naval Undersea Warfare Center
Joseph Legris - Naval Undersea Warfare Center
Eric Warner - Naval Undersea Warfare Center
Vijaya Chalivendra - University of Massachusetts Dartmouth

11:18AM

Experimental Investigation of Nicker Nut Shell Powder Filler Blended Epoxy-Based Biopolymer Composite

Technical Paper Publication: IMECE2023-110837
Arumugam Pachiappan - Rajalakshmi Engineering College
Senthil Kumar Velukkudi Santhanam - Anna University

11:39AM

Experimental Investigation, Characterization, and Microstructural Enhancement of Laser Cladded Al-Si-Sn-Cu/Ti-6Al-4V Composite Coatings

Technical Paper Publication: IMECE2023-112906
Olawale Samuel Fatoba - University of Johannesburg
Tien-Chien Jen - University of Johannesburg
04-05-01: MATERIALS PROCESSING AND CHARACTERIZATION
10/31/2023
10:15AM–12:00PM – ROOM 291

10:15AM
Impact Behavior and Failure of 3D Printed Reinforced Composites

Technical Paper Publication: IMECE2023-111719
Xiaofang Liu - Tufts University
Anil Saigal - Tufts University
Michael Zimmerman - Tufts University

10:57AM
Characterization of the Viscoelastic Mechanical Properties of Ultra High Molecular Weight Polyethylene Fiber Reinforced Composites

Technical Paper Publication: IMECE2023-111244
Jonmichael Weaver - Montana State University
David Miller - Montana State University

11:18AM
Effects of Areal Surface Topography on Thermal Oxidation of Ti6Al4V

Technical Paper Publication: IMECE2023-112523
Rabelani Murwamadala - University of South Africa
Veeradhi, Vasudeva Rao - University of South Africa

11:39AM
Cryogenic Analysis Measuring Thermal Expansion Coefficient of Silicon Nitride and Sapphire via the Strain Gauge Method and Computational System Coupling

Technical Paper Publication: IMECE2023-113210
Kirsten Lovelace - Howard University
Ruth Davis - Howard University
Sonya Smith - Howard University

04-20-01: DYNAMICS OF ADVANCED FUNCTIONAL MATERIALS AND STRUCTURES
10/31/2023
2:00PM–3:45PM – ROOM 263

2:00PM
Construction, Analysis, and Verification of a 3D-Printed Carbon Fiber-Silicone Composite System for Vibration Isolation

Technical Presentation: IMECE2023-120109
Dhiren Upadhyaya - Rutgers University
Ziyad Abouelenin - Rutgers University
Patrick Hull - NASA Marshall Space Flight Center
Aaron Mazzeo - Rutgers University

2:21PM
Crushing Behavior of a 3D-Printed Bio-Inspired Energy Absorber: Testing, Modeling, and Rapid Design

Technical Presentation: IMECE2023-113080
Feng Zhu - Johns Hopkins University
Kael Kinney - Johns Hopkins University
Zhiquing Cheng - Innovision LLC

2:42PM
Development of Laser Induced Particle Impact Test (LIPIT) as High-Speed Micro Impact Testing

Technical Paper Publication: IMECE2023-111508
Miki Kajihara - Chuo University
Kanari Nagaami - Chuo University
Takeru Miyagawa - Chuo University
Akio Yonezu - Chuo University
3:03PM

Evaluation of Fracture and Fatigue Properties of Graphene Oxide by Atomic Force Microscope and Molecular Dynamics Simulation

Technical Paper Publication: IMECE2023-113255
Shunsuke Sakuma - Chuo University
Yusuke Nakao - Chuo University
Tomoyasu Tanaka - Chuo University
Akio Yonezu - Chuo University

3:24PM

Bioinspired Golden Spiral Shapes on Crushing Protection Behaviors of Tubular Structures

Technical Presentation: IMECE2023-119932
John Sherman - The University of North Carolina at Charlotte
Jun Xu - The University of North Carolina at Charlotte

2:00PM

Synthesis of Tungsten-Doped TiO2 Nanopowders Prepared by Pulsed-Laser Decomposition of Liquid TTIP

Technical Presentation: IMECE2023-120482
Mustafa Mozael - Loyola Marymount University
Stephen D. Tse - Rutgers University
Bernard Kear - Rutgers University

2:21PM

Determination of Material Parameters of In740H Under Different Experimental Situations Using Chaboche Model

Technical Paper Publication: IMECE2023-110747
ELNAZ HADDADI - The University of North Carolina at Charlotte
Michael Zimnoch - The University of North Carolina at Charlotte
Alireza Tabarraei - The University of North Carolina at Charlotte

2:42PM

Characterizing the Effect of Post Weld Heat Treatment on the Mechanical Properties of Laser Beam Welded Additive Manufactured Ti6Al4V

Technical Paper Publication: IMECE2023-115057
Esther T. Akinlabi - Northumbria University
Peter Omoniyi - University of Johannesburg
Tien-Chien Jen - University of Johannesburg
Rasheedat Mahamood - University of Johannesburg
Frederick Mwema - Northumbria University
Stephen A. Akinlabi - Northumbria University
Cynthia Abima - University of Johannesburg
3:03PM
Shielding of Spacecraft and Satellites From Micrometeorites and Space Debris
Technical Paper Publication: IMECE2023-114050
Nishant Thakkar - Gannon University
Davide Piovesan - Gannon University

3:24PM
An Innovative and Novel Aluminum Metal Microsphere Production and Deposition Method Using a Pulsed DC Cold Plasma Process
Technical Paper Publication: IMECE2023-113020
Rebecca Almandoz - Lawrence Technological University
Robert Fletcher - Lawrence Technological University
Joseph M. Ziegelbauer - Intecells, Inc.

04-03-01: MECHANICAL METAMATERIALS
10/31/2023
4:00PM–5:45PM – ROOM 263

4:00PM
Topological Mechanics of Continuous Micropolar Elastic Media
Technical Presentation: IMECE2023-120317
Mohamed Shaat - Southern Methodist University
Xin-Lin Gao - Southern Methodist University

4:21PM
Strategy for Multi-Level Memory in Mechanical Metamaterial
Technical Presentation: IMECE2023-120253
Jack Pechac - University of California, San Diego
Michael Frazier - University of California, San Diego

4:42PM
Design of Low Density Architectured Metamaterials With High Compressive and Torsional Stiffness
Technical Paper Publication: IMECE2023-110261
Xiangbei Liu - Dartmouth College
Joseph Jeon - Dartmouth College
Anisia Tiplea - Dartmouth College
Yan Li - Dartmouth College
Bo Song - Sandia National Laboratories

5:03PM
Asymmetrical Auxetic Structures for Impact Force Mitigation
Technical Paper Publication: IMECE2023-112772
Chulho Yang - Oklahoma State University
Dongchan Lee - Institute for Advanced Engineering
Ben Worwag - Oklahoma State University

5:24PM
Design Optimization Framework for Uniform Stress Distribution of Mechanical Metamaterials
Technical Paper Publication: IMECE2023-112793
Shammo Dutta - The University of Alabama
Sree Kalyan Patiballa - The University of Alabama
TECHNICAL SESSIONS

04-06-01: NANOENGINEERED, NANO MODIFIED, HIERARCHICAL, MULTI-SCALE MATERIALS AND STRUCTURES
10/31/2023
4:00PM–5:45PM – ROOM 264

4:00PM
Monolayer 2D Material-Polymer Nanohybrid Crystals

Technical Presentation: IMECE2023-120343
Mingyuan Sun - Villanova University
Dong Zhou - Villanova University
Akash Singh - University of Illinois at Urbana-Champaign
Lu An - Villanova University
Jan Michael Carrillo - Oak Ridge National Laboratory
Jong Keum - Oak Ridge National Laboratory
Miguel Fuentes-Cabrera - Oak Ridge National Laboratory
Raymond Unocic - Oak Ridge National Laboratory
Kunlun Hong - Oak Ridge National Laboratory
Ilia Ivanov - Oak Ridge National Laboratory
Christopher Rouleau - Oak Ridge National Laboratory
Gang Feng - Villanova University
Kai Xiao - Oak Ridge National Laboratory
Jihua Chen - Oak Ridge National Laboratory
Yumeng Li - University of Illinois at Urbana-Champaign
Liang Zhao - Villanova University
Yun Li - Villanova University
Bo Li - Villanova University

4:21PM
Mechanism of Densified Cnt Yarn Strength Using Molecular Dynamics Calculations

Technical Presentation: IMECE2023-119806
Kuzuno Yoshimasa - Waseda University
Shota Endo - Waseda University
Yugo Ikuta - Waseda University
Toru Ito - Waseda University
Akira Kunitomo - Toyota Motor Corporation
Atsushi Hosoi - Waseda University
Hiroyuki Kawada - Waseda University

4:42PM
Experimental Investigation of Process Induced Effects on Surface Roughness Characteristics of 3D Printed Parts in a Polyjet AM Setup

Technical Paper Publication: IMECE2023-113460
Vishwanath Khapper - North Carolina Agricultural and Technical State University
Nitin More - North Carolina Agricultural and Technical State University
Ram Mohan - North Carolina Agricultural and Technical State University

5:03PM
Graphene Reinforced PVDF Nanofibers Fabricated With the ForceSpinning® Method for Water Desalination Applications

Technical Paper Publication: IMECE2023-113900
Elmmer A. Vera Alvarado - The University of Texas Rio Grande
Md. Abdur Rahman Bin Abdus Salam - The University of Texas Rio Grande Valley
Ali Ashraf - The University of Texas Rio Grande
Karen Lazano - The University of Texas Rio Grande Valley
5:24PM

Multiphase Modeling of Droplet-Based 3D Printing: Predicting Printability, Resolution and Shape Fidelity in Additive Manufacturing Processes

Technical Paper Publication: IMECE2023-117205
Rauf Shah - North Carolina A&T State University
Ram V. Mohan - North Carolina A&T State University

04-01-02: MECHANICS OF DESIGN, PROCESSING, AND PERFORMANCE OF HETEROGENEOUS COMPOSITES
10/31/2023
4:00PM—5:45PM – ROOM 288

4:00PM

Effect of Physical Modification on the Tensile and Thermal Properties of Plantain Fibre Polymer Composite

Technical Paper Publication: IMECE2023-112942
Patrick Imoisili - University of Johannesburg
Tien-Chien Jen - University of Johannesburg

4:21PM

Behavior of Bamboo Fiber Reinforced Composites: Pristine and Damaged

Technical Paper Publication: IMECE2023-114033
Abd-Elrahman Korayem - Michigan State University
Alexander Kepreos - Michigan State University
Mahmoodul Haq - Michigan State University

4:42PM

Mechanical Properties and Interfacial Strength of Active Material Layer/Copper Foil of Anode Sheet in Lithium-Ion Battery (LiB)

Technical Paper Publication: IMECE2023-113250
Kazuma Ogata - Chuo University
Yoshinori Takano - Chuo University
Shotaro Yasuda - Chuo University
Yuto Shibayama - Chuo University
Akio Yonezu - Chuo University

5:03PM

On the Delamination of CFRP and Epoxy Adhesive Interface Using Laser Shock Adhesion Test (LaSAT)

Technical Paper Publication: IMECE2023-113400
Aoi Takagi - Chuo University
Yuichi Hosoya - Chuo University
Shotaro Yasuda - Chuo University
Kazuma Ogata - Chuo University
Tomo Takeda - Japan Aerospace Exploration Agency
Akio Yonezu - Chuo University

5:24PM

Data Analytics for Mining Process-Structure-Property Linkages for Hierarchical Materials

Technical Presentation: IMECE2023-111802
Surya Kalidindi - Georgia Institute of Technology
TECHNICAL SESSIONS

04-05-03: MATERIALS PROCESSING AND CHARACTERIZATION
10/31/2023
4:00PM–5:45PM – ROOM 291

4:00PM
Atomistic Study on the Cooling Rate Induced Mechanical Properties Variations in Additively Manufactured Inconel-718

Technical Paper Publication: IMECE2023-114456
Toushiqul Islam - Bangladesh University of Engineering and Technology
Md Samin Ashiq Aziz - Bangladesh University of Engineering and Technology
Mohammad Motalab - Bangladesh University of Engineering and Technology
Abrar Faiyad - University of California, Merced

4:21PM
Non-Linear Behavior of Raman Linewidth of WSe2

Technical Presentation: IMECE2023-114153
Elham Easy - Stevens Institute of Technology
Xian Zhang - Stevens Institute of Technology

4:42PM
Evaluation of Mechanical Properties and Investigation of Fracture Morphology of CNT Yarns Prepared by the Floating Catalyst Chemical Vapor Deposition

Technical Presentation: IMECE2023-119950
Ryuya Dotei - Waseda University
Manamu Sohail - Waseda University
Akira Kunitomo - Toyota Motor Corporation
Atsushi Hosoi - Waseda University
Hiroyuki Kawada - Waseda University

5:03PM
Improving the Long-Term Durability of Polymers Used in Biomedical Applications

Technical Paper Publication: IMECE2023-112796
Mohammad Hossain - Texas A&M University–Kingsville
Ravi Chandra Madasani - Texas A&M University–Kingsville

5:24PM
Effect of Impactor Diameter on the Residual Properties of Impact Damaged Composite Panels

Technical Paper Publication: IMECE2023-112892
A.M. Sreenath - National Institute of Technology Calicut
Raghu Prakash - Indian Institute of Technology Madras
WEDNESDAY, 11/1/2023

04-05-04: MATERIALS PROCESSING AND CHARACTERIZATION
11/1/2023
10:45AM–12:30PM – ROOM 267

10:45AM
Mechanical and Damping Characteristics of Nanocarbon Reinforced 2024 Aluminum Composites for Aerospace Applications

Technical Presentation: IMECE2023-119819
Sabrina Nilufar - Southern Illinois University Carbondale
Wilson Rativa-Parada - Southern Illinois University Carbondale

11:06AM
PVC-Based Materials for Thermoformed Tactile Diagrams: Assessment and Characterization

Technical Paper Publication: IMECE2023-115126
Ganesh S - Indian Institute of Technology Delhi
Ramya Ahuja - Indian Institute of Technology Delhi
Priyank Goel - Indian Institute of Technology Delhi
Pulkit Sapra - Indian Institute of Technology Delhi
Pv Madhusudhan Rao - Indian Institute of Technology Delhi

11:27AM
Testing and Analysis of Mechanical and Corrosion Properties of 2024 Aluminum Alloy Using Friction Stir Processing

Technical Paper Publication: IMECE2023-111487
Shanthakumar D - Anna University
Senthil Kumar Velukkudi Santhanam - Anna University
Raman Kuppusamy - Anna University

11:48AM
Fabrication of NiTi Samples Using Pressureless Sintering of Uncompacted Metal Powder

Technical Paper Publication: IMECE2023-112506
Fares Alawwa - Khalifa University
Rashid K. Abu Al-Rub - Khalifa University
Bashar El-Khasawneh - Khalifa University
Wael Zaki - Khalifa University

04-09-01: DESIGN OF ENGINEERING MATERIALS
11/1/2023
10:45AM–12:30PM – ROOM 269

10:45AM
Breaking Stress Criterion That Changes Everything We Know About Materials Failure

Technical Presentation: IMECE2023-119646
Ali Nour El Hajj - American University of Beirut

11:06AM
Inverse Design of Cellular Mechanical Metamaterials With Micro-Genetic Algorithm for Parameter Space Exploration

Technical Presentation: IMECE2023-119730
Sheng Liu - Virginia Tech
Pinar Acar - Virginia Tech

11:27AM
Composites and Sustainability: What Is the State of the Art?

Technical Paper Publication: IMECE2023-112333
Ned Patton - Patton Engineering and Consulting
## TECHNICAL SESSIONS

### 11:48AM

**Acoustic Cloak Design via Gradient-Based Optimization**

Technical Paper Publication: IMECE2023-113932  
Angel Avina - San Jose State University  
Samer Gerges - San Jose State University  
Feruza Amirkulova - San Jose State University  
Winncy Du - San Jose State University

### 11:06AM

**A Numerical Study on Closed-Loop Control System for Frontal Polymerization-Assisted Layer-by-Layer Additive Manufacturing**

Technical Presentation: IMECE2023-119850  
Zhuoting Chen - University of Wyoming  
Xiang Zhang - University of Wyoming

### 12:09PM

**Efficient Inverse Design of Acoustic Metamaterials Using Gradient-Based Optimization**

Technical Paper Publication: IMECE2023-114231  
Samer Gerges - San Jose State University  
Feruza Amirkulova - San Jose State University  
Jovana Samaniego - San Jose State University

### 11:27AM

**Embedded 3D Printing of Thermosetting Polymer Composites**

Technical Presentation: IMECE2023-119211  
Majid Minary - The University of Texas at Dallas

### 11:48AM

**3D Printing of Continuous Fiber-Reinforced Thermoset Composites**

Technical Presentation: IMECE2023-110812  
Kai Yu - University of Colorado Denver

### 10:45AM – 12:30PM – ROOM 268

**04-29-01: ADDITIVE MANUFACTURING AND 3D PRINTING**

11/1/2023

### 10:45AM

**Modeling of Additive Manufacturing of Frontally-Polymerizing Thermoset Polymers**

Technical Presentation: IMECE2023-120047  
Aditya Kumar - Georgia Institute of Technology  
Michael Zakoworotny - University of Illinois at Urbana-Champaign  
Philippe Geubelle - University of Illinois at Urbana-Champaign

### 12:09PM

**Thermo-Chemo-Rheological Modeling of Frontal Polymerization-Based Direct Ink Writing of Thermoset Polymers**

Technical Presentation: IMECE2023-119651  
Michael Zakoworotny - University of Illinois at Urbana-Champaign  
Javier Balta - University of Illinois at Urbana-Champaign  
Aditya Kumar - Georgia Institute of Technology  
Randy Ewoldt - University of Illinois at Urbana-Champaign  
Nancy Sottos - University of Illinois at Urbana-Champaign  
Sameh Tawfick - University of Illinois at Urbana-Champaign  
Philippe Geubelle - University of Illinois at Urbana-Champaign
### TECHNICAL SESSIONS

#### 04-05-05: MATERIALS PROCESSING AND CHARACTERIZATION
**11/1/2023**
**2:00PM–4:45PM – ROOM 267**

**2:00PM**
Assessing Mechanical Properties and Failure Behaviors of Lithiated Silicon: Insights From Microscale Compression Testing

Technical Presentation: IMECE2023-119505
Junghoon Yeom - U.S. Naval Research Laboratory
Matthew Lefler - U.S. Naval Research Laboratory
Christopher Rudolf - U.S. Naval Research Laboratory
Corey Love - U.S. Naval Research Laboratory

**2:42PM**
Fracture Mechanics of Tetragraphene Under Mixed Mode Loading

Technical Paper Publication: IMECE2023-111443
ELNAZ HADDADI - The University of North Carolina at Charlotte
Alireza Tabbaraei - The University of North Carolina at Charlotte

**3:03PM**
Tensile and Fracture Characteristics of Fibrous Cellulose Papers: A Study of Processing Parameters Using DIC

Technical Presentation: IMECE2023-119621
Azeez Adebayo - Auburn University
Burak Aksoy - Auburn University
Hareesh Tippur - Auburn University

**3:24PM**
Mechanical Characterization and Constitutive Modeling of High-Temperature Fluoroelastomers

Technical Presentation: IMECE2023-118663
Brent Johnson - University of Dayton
Allyson Cox - University of Dayton
Chad Jones - Maverick Corporation
Tim Osborn - University of Dayton
Robert Gray - Maverick Corporation
Robert Lowe - University of Dayton

#### 04-29-02: FRONTAL POLYMERIZATION AND 3D PRINTING
**11/1/2023**
**2:00PM–3:45PM – ROOM 268**

**2:00PM**
Process Modeling and Optimization of Flash-Cure Manufacturing of Thermoset Composites

Technical Presentation: IMECE2023-119962
Sagar Vyas - University of Illinois at Urbana-Champaign
Nil Parikh - University of Illinois at Urbana-Champaign
Nancy Sottos - University of Illinois at Urbana-Champaign
Philippe Geubelle - University of Illinois at Urbana-Champaign

**2:21PM**
A Numerical Study on Through-Thickness Frontal Polymerization and Depolymerization of Multi-Sacrificial Fiber Embedded Vascular Composite System

Technical Presentation: IMECE2023-119852
Zhuoting Chen - University of Wyoming
Xiang Zhang - University of Wyoming
2:42PM
Improved Fiber-Matrix Adhesion in Frontally Cured Thermoset Composites

Technical Presentation: IMECE2023-119630
Tyler Price - University of Illinois at Urbana-Champaign
Jacob Lessard - University of Illinois at Urbana-Champaign
Julian Cooper - University of Illinois at Urbana-Champaign
Sameh Tawfick - University of Illinois at Urbana-Champaign
Jeffrey Moore - University of Illinois at Urbana-Champaign
Nancy Sottos - University of Illinois at Urbana-Champaign

3:03PM
3D Printing of Repairable, Reshapeable, and Recyclable Fiber-Reinforced Composites by Two-Stage Curing

Technical Presentation: IMECE2023-119726
Huan Jiang - University of Colorado Denver
Kai Yu - University of Colorado Denver
Martin Dunn - University of Colorado Denver

2:21PM
Elephant Trunk Inspired Soft Robotic Arm via Liquid Crystal Elastomers

Technical Presentation: IMECE2023-120188
Sophie Leanza - Stanford University
Juliana Lu-Yang - Stanford University
Shuai Wu - Stanford University
Ellen Kuhl - Stanford University
Renee Zhao - Stanford University

2:42PM
Shape Morphing Through Global and Simple Actuation Mechanisms

Technical Presentation: IMECE2023-120043
Tian Chen - University of Houston

3:03PM
Bioinspired Multifunctional Active Origami for Medical Applications

Technical Presentation: IMECE2023-119997
Ruike Renee Zhao - Stanford University

3:24PM
Mechanical Characterization of Yucca Plant for Potential Biomimetic Applications

Technical Paper Publication: IMECE2023-113300
Rickelle Shaw - Advanced Sterilization Products
Kyle Robertson - Rivian
Gustavo Vargas-Silva - Public University of Navarra
Daryl Mixon - California State Polytechnic University, Pomona
Mariappan Jawaharlal - California State University, Sacramento
TECHNICAL SESSIONS

04-05-06: MATERIALS PROCESSING AND CHARACTERIZATION
11/1/2023
4:00PM–5:45PM – ROOM 267

4:00PM
On the Strength of Thin Cu Wires Welded by Joule Heat
Technical Presentation: IMECE2023-112476
Hironori Tohmyoh - Tohoku University
Taiga Sakatoku - Tohoku University

5:03PM
Comparison of IZOD Impact Energies and Ductile to Brittle Transition Behavior of 3D Printed versus Sheet Extruded Polymers
Technical Paper Publication: IMECE2023-113095
Cameron Coates - Kennesaw State University
Aaron Adams - Kennesaw State University
Wayne Johnson - University of Georgia
Ryan Foster - Kennesaw State University
Christian Cook - Kennesaw State University

4:21PM
Stiffness Degradation in CFRP Laminates Subjected to Fatigue Loading
Technical Paper Publication: IMECE2023-113377
Raghu Prakash - IIT Madras

5:24PM
Identification of Carbon Diffusivity of S9310 Utilizing Correlated Numerical and Experimental Investigations
Technical Paper Publication: IMECE2023-113168
Dong Xu - University of Connecticut
Jeongho Kim - University of Connecticut
Lesley Frame - University of Connecticut
Jiong Tang - University of Connecticut

04-29-03: FRONTAL POLYMERIZATION AND MACHINE LEARNING
11/1/2023
4:00PM–5:45PM – ROOM 268

4:00PM
A Digital Twin for Vacuum Assisted Resin Infusion Molding Process Based on Deep Machine Learning Modeling
Technical Presentation: IMECE2023-116509
Dong Qian - The University of Texas at Dallas
Runyu Zhang - The University of Texas at Dallas
Yingjian Liu - The University of Texas at Dallas
Hongbing Lu - The University of Texas at Dallas
4:42PM

Manufacturing of Patterned Polymeric Materials by Controlling Frontal Polymerization Instabilities

Technical Presentation: IMECE2023-119515
Philippe Geubelle - Beckman Institute of Advanced Science and Technology
Yuan Gao - Huazhong University of Science and Technology
Justine Paul - Beckman Institute of Advanced Science and Technology
Luis Rodriguez Koett - Beckman Institute of Advanced Science and Technology
Qibang Liu - Beckman Institute of Advanced Science and Technology
Nancy Sottos - Beckman Institute of Advanced Science and Technology

5:03PM

An Adaptive Surrogate Deep-Learning Model of Frontal Polymerization

Technical Presentation: IMECE2023-119708
Qibang Liu - University of Illinois at Urbana-Champaign
Diab Abueidda - University of Illinois at Urbana-Champaign
Seid Koric - University of Illinois at Urbana-Champaign
Yuan Gao - Huazhong University of Science and Technology
Sagar Vyas - University of Illinois at Urbana-Champaign
Philippe Geubelle - University of Illinois at Urbana-Champaign

5:24PM

Frontal-Polymerization-Based Growth Printing: Process Modeling and Optimization

Technical Presentation: IMECE2023-119890
Matthew Minjiang Zhu - University of Illinois at Urbana-Champaign
Yun Seong Kim - University of Illinois at Urbana-Champaign
Tanver Hossain - University of Illinois at Urbana-Champaign
Yuan Gao - Huazhong University of Science and Technology
Sameh Tawfick - University of Illinois at Urbana-Champaign
Randy Ewolt - University of Illinois at Urbana-Champaign
Philippe Geubelle - University of Illinois at Urbana-Champaign

04-17-01: MANUFACTURING, INTEGRATION, AND CHARACTERIZATION OF MULTIFUNCTIONAL STRUCTURE AND DEVICES

11/1/2023
4:00PM–5:45PM – ROOM 269

4:00PM

Deployable Electromagnetic Waveguides Inspired by Origami

Technical Presentation: IMECE2023-113621
Nikhil Ashok - The Pennsylvania State University
Xin Ning - The Pennsylvania State University
TECHNICAL SESSIONS

4:21PM
A Multifunctional Bistable Ultrathin Composite Boom With Soft Electronics for Dynamics Monitoring in Space

Technical Presentation: IMECE2023-113618
Yao Yao - The Pennsylvania State University
Xin Ning - The Pennsylvania State University

4:42PM
Predicting and Controlling Ribbing Instabilities of CNT-PDMS Systems for Multifunctional Applications

Technical Presentation: IMECE2023-113125
Matthew Phillips - North Carolina State University
Jong Ryu - North Carolina State University
Mohammed Zikry - North Carolina State University

5:03PM
Next Generation High Temperature Laser Ultrasound Transducer Development Assisted by FEA and Statistical Design

Technical Presentation: IMECE2023-113473
Sipan Liu - North Carolina State University
Jong Eun Ryu - North Carolina State University
Xiaoning Jiang - North Carolina State University

5:24PM
Linear Microstructures Fabrication in Meter-Scale by Roll-to-Roll Method

Technical Presentation: IMECE2023-113472
Jong Eun Ryu - North Carolina State University
Sipan Liu - North Carolina State University
Benjamin Black - North Carolina State University

4:00PM
Structural Radiative Cooling in Highly Reflective White Snail Shells as Adaptation to Extreme Heat Environments

Technical Presentation: IMECE2023-120113
Andrea Felicelli - Purdue University
Emily Barber - Purdue University
Sultan Alnajdi - Purdue University
Xiulin Ruan - Purdue University
George Chiu - Purdue University
Pablo Zavattieri - Purdue University
Dror Hawlena - Hebrew University of Jerusalem

4:21PM
Manufacturing and Testing of Multilayer Head Tissue Electrically Biomimicking Material Composite

Technical Presentation: IMECE2023-120167
Richie Ranaisa Daru - The University of Texas at Arlington
Ashfaq Adnan - The University of Texas at Arlington

4:42PM
Design and Optimization of Aircraft Wing Structures Inspired by Avian Bones

Technical Presentation: IMECE2023-113626
Sepideh Ebad Sichani - The Pennsylvania State University
Xin Ning - The Pennsylvania State University
5:03PM
Bio-Inspired Electronic Skin for Morphing Wings
Technical Presentation: IMECE2023-113521
Nikhil Ashok - The Pennsylvania State University
Xin Ning - The Pennsylvania State University

5:24PM
From Leafhopper to Camouflage and Display
Technical Presentation: IMECE2023-112801
Zhuo Li - Carnegie Mellon University
Sheng Shen - Carnegie Mellon University
Hyeong Seok Yun - Carnegie Mellon University

7:00PM

discussion on a specific topic. These sessions are structured to provide opportunities for networking, collaboration, and knowledge sharing among attendees. Each session is led by experts in their respective fields, ensuring a high level of education and engagement. The topics covered range from innovative materials processing and characterization to advanced composite manufacturing and properties, reflecting the diversity and depth of research presented atIMECE 2023. Attendees can expect to gain valuable insights into the latest developments and trends in the field of mechanical engineering. Whether you’re a researcher, a student, or an industry professional, the technical sessions atIMECE 2023 offer a platform to learn, connect, and contribute to the ongoing advancements in mechanical engineering.
10:36AM
Effects of Graphene Surface Friction and Dispersion on the Damping Properties of Reinforced Polymers

Technical Presentation: IMECE2023-113324
Jigang Feng - Tsinghua University
Zhaoye Qin - Tsinghua University
Fulei Chu - Tsinghua University

10:57AM
The Mechanical and Functional Behavior of Nitinol-Reinforced PLA Composites

Technical Paper Publication: IMECE2023-112613
Pooya Srinivas - Khalifa University
Rashid K. Abu Al-Rub - Khalifa University
Imad Barsoum - Khalifa University
Wael Zaki - Khalifa University

11:18AM
A Study on the Effect of Fiber Orientation on the Strength and Failure of 3D-Printed Carbon Fiber Reinforced Polymers

Technical Paper Publication: IMECE2023-114034
Yesim Kokner - The City College of New York
Arthur Delpierre - The City College of New York
Jason P. Couzis - The City College of New York
Mahmoud Ardebili - Borough of Manhattan Community College/The City University of New York
Feridun Delale - The City College of New York

10:36AM
04-17-02: MANUFACTURING, INTEGRATION AND CHARACTERIZATION OF MULTIFUNCTIONAL STRUCTURE AND DEVICES
11/2/2023
10:15AM–12:00PM – ROOM 269

10:15AM
Liquid Nanofoam With Extra Gas - A Reusable Energy Mitigation System

Technical Presentation: IMECE2023-119549
Mingzhe Li - Georgia Institute of Technology
Weiyi Lu - Michigan State University

10:36AM
A Novel Fabrication Method to Manufacture Two-Dimensional Flexible Devices

Technical Presentation: IMECE2023-114211
Elham Easy - Stevens Institute of Technology
Xian Zhang - Stevens Institute of Technology

10:57AM
Effect of Stress Triaxiality on Creep Deformation of Polyaramid-Reinforced Elastic Cements

Technical Paper Publication: IMECE2023-113350
Elizabeth Contreras - Aramco Americas
Thomas Heinold - Saudi Aramco
Roland Martinez - Aramco Americas
Kenneth Johnson - Aramco Americas
10:15AM
Laser-Induced Graphene on Polymers: Tailoring Morphology and Surface Chemistry for Implantable Flexible Devices
Technical Presentation: IMECE2023-120148
Mostafa Bedewy - University of Pittsburgh

10:36AM
Printed Electronic Devices for Environmental Monitoring
Technical Presentation: IMECE2023-119577
Gregory Whiting - University of Colorado Boulder
Eliot Strand - University of Colorado Boulder
Eloise Bihar - University of Colorado Boulder
Madhur Atreya - University of Colorado Boulder

10:57AM
Self-Limiting Electrospray Deposition for Efficient Functional Enhancement of 2D and 3D Architectures
Technical Presentation: IMECE2023-119848
Jonathan Singer - Rutgers University

11:18AM
3D-Printed Biomedical Devices
Technical Presentation: IMECE2023-119628
Kaiyan Qiu - Washington State University

11:39AM
DIW 3D Printing of Mechanically Optimized Graphene-Polymer Nanocomposites
Technical Presentation: IMECE2023-119851
Zi Xin Zhang - McGill University
Changhong Cao - McGill University

2:00PM
A Precise Method to Characterize Thermal Transport Properties of Two-Dimensional Ferromagnetic Materials
Technical Presentation: IMECE2023-114177
Elham Easy - Stevens Institute of Technology
Isabella Disturco - Stevens Institute of Technology
Xian Zhang - Stevens Institute of Technology

2:21PM
Enhanced Performance of Laser Dressed Wheels in Internal Grinding of Bearing Steel Parts
Technical Paper Publication: IMECE2023-115153
Sudheendra Bindgi - SDM College of Engineering and Technology, Dharwad
Ramesh Babu N - Indian Institute of Technology

2:42PM
Review of Life Limitations for Acrylic Windows in Pressure Vessels
Technical Paper Publication: IMECE2023-114381
Daniel Hurd - Atlantis Submarines
Bart Kemper - Kemper Engineering Services, LLC
Taylor Nappi - U.S. Navy
Kaylie Kling Williams - Lockheed Martin
TECHNICAL SESSIONS

3:03PM

Experiment and Characterization of Temperature Dependent Dynamic Properties of Graphite Magnetorheological Grease

Technical Paper Publication: IMECE2023-112935
Jiqiang Dong - Nanjing University of Science and Technology
Runsong Mao - Nanjing University of Science and Technology
Huixing Wang - Nanjing University of Science and Technology
Jiong Wang - Nanjing University of Science and Technology

2:42PM

In Situ Investigation of Deformation Mechanisms in Polycrystalline Metallic Nanowires

Technical Presentation: IMECE2023-120125
Hongyu Wang - North Carolina State University
Zhi Li - Institute of High Performance Computing, Agency for Science, Technology and Research
Junyu Ge - Nanyang Technological University
Hong Li - Nanyang Technological University
Huajian Gao - Nanyang Technological University
Yong Zhu - North Carolina State University

3:03PM

Deformation and Fracture Response of Atomically Layered Crystals

Technical Presentation: IMECE2023-120082
Milos Dujović - Texas A&M University
Miladin Radovic - Texas A&M University
Ankit Srivastava - Texas A&M University

04-28-01: MODELING AND EXPERIMENTS IN NANOMECHANICS AND NANOMATERIALS

11/2/2023
2:00PM–3:45PM – ROOM 268

2:00PM

Cation Selectivity in Single Walled Carbon Nanotubes

Technical Presentation: IMECE2023-120284
MD MOHAIMINUL ISLAM - Temple University
Ling Liu - Temple University

2:21PM

Submerged Plasma Synthesis of Graphene Nanoflakes

Technical Presentation: IMECE2023-120445
Chuiyuan Meng - Rutgers University—New Brunswick
Bernard Kear - Rutgers University—New Brunswick
Stephen Tse - Rutgers University—New Brunswick

04-26-01: INTEGRATED COMPUTATIONAL MATERIALS ENGINEERING (ICME) MINI-SYMPOSIUM

11/2/2023
2:00PM–3:45PM – ROOM 269

2:00PM

Micro-Mechanical Computational Framework for Deformation Twinning

Technical Presentation: IMECE2023-120249
Akhilesh Pedgaonkar - University of Wisconsin-Madison
Anderson Nascimento - University of California, Santa Barbara
Curt Bronkhorst - University of Wisconsin-Madison
Irene Beyerlein - University of California, Santa Barbara
2:21PM
Local Global Decompositions: Statistical Physics Inspired Hybrid Deep Learning Frameworks

Technical Presentation: IMECE2023-119943
Andreas Robertson - Georgia Institute of Technology
Conlain Kelly - Georgia Institute of Technology
Michael Buzzy - Georgia Institute of Technology
Surya Kalidindi - Georgia Institute of Technology

2:42PM
Big Datasets in Materials Informatics: Generating Statistically Diverse Heterogeneous Microstructures

Technical Presentation: IMECE2023-119947
Andreas Robertson - Georgia Institute of Technology
Adam Generale - Georgia Institute of Technology
Surya Kalidindi - Georgia Institute of Technology

3:03PM
Stochastic Inverse Microstructure Design

Technical Presentation: IMECE2023-119721
Adam Generale - Georgia Institute of Technology
Andreas Robertson - Georgia Institute of Technology
Conlain Kelly - Georgia Institute of Technology
Surya Kalidindi - Georgia Institute of Technology

2:00PM
A Meshfree Phase-Field Model for Simulating the Sintering Process of Metallic Particles for Printed Electronics

Technical Presentation: IMECE2023-119660
Zhida Huang - Case Western Reserve University

2:21PM
Printed, Flexible, Ionic-Liquid-Based Hydrogen Sensor via Aerosol Jet Printing of Nanomaterials

Technical Presentation: IMECE2023-119246
Changyong Cao - Case Western Reserve University
Huigang Wang - Case Western Reserve University
Xiaojun Liu - Oakland University
Xiangjun Zeng - Oakland University
Yuhui Fang - 4D Maker LLC

2:42PM
Effect of Miniaturization Using Droplet Based Micro Fluidic Systems on the Synthesis of UiO-66 MOF Nanoparticles

Technical Paper Publication: IMECE2023-114404
Selis Onel - Hacettepe University
Buse Parlak - Hacettepe University
Gaye Korkmaz - Hacettepe University
Gokcen Elif Dilci - Hacettepe University
3:03PM
Influence of Heat Treatment on the Microstructural Properties of Wire Arc Additively Manufactured Inconel 625 Alloy

Technical Paper Publication: IMECE2023-115197
Thangapandian N - St. Joseph’s Institute of Technology
Manivannan Roja - CSIR-Central Mechanical Engineering Research Institute
Ragavanantham Shanmugam - Fairmont State University
Vivekananda A S - Dhanalakshmi Srinivasan College of Engineering and Technology
Rangarajan Venkatesan - St. Joseph’s Institute of Technology, Chennai

2:21PM
Crystal Plasticity Simulations of Spall Damage Morphology in FCC Bicrystals

Technical Presentation: IMECE2023-113448
Carlisle Fauver - Texas A&M University
D.J. Luscher - Los Alamos National Laboratory
Justin Wilkerson - Texas A&M University

2:42PM
High-Rate Characterization and Modeling of a Hyperelastic Block Copolymer Subjected to Ballistic Impact

Technical Presentation: IMECE2023-120149
Deborah C. Luckett - U.S. Army Engineer Research and Development Center
Andrew Bowman - U.S. Army Engineer Research and Development Center
Brett Williams - U.S. Army Engineer Research and Development Center
Andrew Lessel - U.S. Army Engineer Research and Development Center
Jesse Sherburn - U.S. Army Engineer Research and Development Center
J. Kent Newman - U.S. Army Engineer Research and Development Center

04-27-01: MECHANICS OF PENETRATION, SHOCK WAVES, AND HIGH-STRAIN-RATE EVENTS: MODELING AND EXPERIMENTS
11/2/2023
2:00PM – 3:45PM – ROOM 291

2:00PM
Response of Graphite to Dynamic Loading and Hypervelocity Jet Impacts

Technical Paper Publication: IMECE2023-111256
Bradley Huddleston - Idaho National Laboratory
Thomas Mason - Idaho National Laboratory
Cody Gibson - Idaho National Laboratory
Colter Angell - Idaho National Laboratory
Nikki Rasmussen - Idaho National Laboratory

3:03PM
A Study of Thermo-Mechanical Response of a Variety of Transparent Polymers Under Projectile Impact

Technical Presentation: IMECE2023-120391
Alireza Amirkhizi - University of Massachusetts Lowell
Alex Krueger - University of Massachusetts, Lowell
3:24PM
Impact Simulations of Conventional Strength Concrete Using Semi-Realistic Concrete Morphologies

Technical Presentation: IMECE2023-119904
William Lawrimore - U.S. Army Engineer Research and Development Center
Andrew Bowman - U.S. Army Engineer Research and Development Center
Mei Chandler - U.S. Army Engineer Research and Development Center
Zackery McClelland - U.S. Army Engineer Research and Development Center

4:00PM
Printed Liquid Metal Sensory System for Wearable Applications and Boxing Training

Technical Presentation: IMECE2023-120318
Jianliang Xiao - University of Colorado Boulder

4:21PM
A Highly Sensitive, Stretchable, and Robust Strain Sensor Based on Crack Advancing and Opening

Technical Presentation: IMECE2023-119835
Shuang Wu - North Carolina State University
Katherine Moody - North Carolina State University
Abhiroo Kollipara - North Carolina State University
Yong Zhu - North Carolina State University

4:42PM
Fabrication of Conductive Patterns by Laser Irradiation and Thermal Treatment of Silver Nanoparticle Inks for Flexible Printed Electronics

Technical Paper Publication: IMECE2023-111946
Rajib Chowdhury - University of Louisiana at Lafayette
Justin Courville - University of Louisiana at Lafayette
Seonhee Jang - University of Louisiana at Lafayette

5:03PM
Characterizing the Shape Memory Behavior of Nitinol Wires in a Low Temperature Environment

Technical Presentation: IMECE2023-116495
Daniel Noel - University of Southern Maine
Asheesh Lanba - University of Southern Maine

4:00PM
Molecular Dynamics Simulations of Salt-Assisted Assembly of MXene Nanosheets on Arbitrary Polymers

Technical Presentation: IMECE2023-120300
Jiayue Hu - Temple University
Ling Liu - Temple University
Liang Zhao - Villanova University
Bo Li - Villanova University
4:21PM

Atomistic Investigation of the Effect of Non-Glide Stress on the Deformation and Dislocation Transfer at Hexagonal Close-Packed Metal Grain Boundary

Technical Paper Publication: IMECE2023-113301

Sunday Oyinbo - University of Johannesburg
Peter Oviroh - University of Johannesburg
Tien-Chien Jen - University of Johannesburg

4:42PM

Numerical Investigation of the Mechanical Behavior of Shape Memory Alloy Triply Periodic Minimal Surface Primitive Lattices

Technical Paper Publication: IMECE2023-113332

Wael Zaki - Khalifa University of Science and Technology
Nguyen Viet - Khalifa University of Science and Technology

5:03PM

Design Optimization and Validation of Compliant Bidirectional Constant Force Mechanisms

Technical Paper Publication: IMECE2023-114336

Jing Li - Shanghai Jiao Tong University
Tanzeel Ur Rehman - Shanghai Jiao Tong University
Zeeshan Qaiser - Tongji University
Shane Johnson - Shanghai Jiao Tong University

04-28-02: MODELING AND EXPERIMENTS IN NANOMECHANICS AND NANOMATERIALS
11/2/2023
4:00PM–5:45PM – ROOM 268

4:00PM

Machine Learning Accelerated Atomistic Simulations for 2D Materials With Defects

Technical Paper Publication: IMECE2023-113427

Shijie Sun - University of Illinois at Urbana-Champaign
Akash Singh - University of Illinois at Urbana-Champaign
Yumeng Li - University of Illinois at Urbana-Champaign

4:21PM

The Role of Interchain Friction on the Nanoscale Energy Dissipation in Amorphous Polymers During Ballistic Impact

Technical Presentation: IMECE2023-120015

Andrew Bowman - U.S. Army Engineer Research and Development Center
Caleb Miller - Liberty University
William Pisani - U.S. Army Engineer Research and Development Center

4:42PM

Crystal Plasticity Modeling for the Strengthening Effect of Multilayered Copper-Graphene Nanocomposites

Technical Presentation: IMECE2023-113779

George Z. Voyiadjis - Louisiana State University

5:03PM

Investigation of Nanomechanical Properties and Interphase of Variable-Size Hard Particles in a Soft Matrix in Atomic Force Microscopy and Finite Element Analysis

Technical Paper Publication: IMECE2023-113071

Tyler Norkus - Arizona State University
Masoud Yekani Fard - Arizona State University
04-26-02
11/2/2023
4:00PM–5:45PM – ROOM 269

4:00PM
Effects of Crystallographic Orientation and Short-Range Ordering on Mechanical Properties and Deformation Behavior of CrCoNi Medium-Entropy Alloy

Technical Presentation: IMECE2023-113528
Charles Matlock - Baylor University
Ning Zhang - Baylor University

4:21PM
Investigating Size Effects in Additively Manufactured Thin Wall Structure at the Microstructure Level

Technical Presentation: IMECE2023-114819
Subhadip Sahoo - The University of Arizona
Gabriel Demeneghi - The University of Alabama in Huntsville
Jason R. Mayeur - Oak Ridge National Laboratory
Kavan Hazeli - The University of Arizona

4:42PM
Application of Machine Learning in Process Analysis of the Friction-Stir Welding Technique

Technical Paper Publication: IMECE2023-114013
Radif Uddin Ahmed - Louisiana Tech University
Chowdhury Sadid Alam - Louisiana Tech University
M. Shafiqur Rahman - Louisiana Tech University

04-18-02: BIOINSPIRED MATERIALS, STRUCTURES AND APPLICATIONS
11/2/2023
4:00PM–5:45PM – ROOM 278

4:00PM
A “Two-Part” Resonance Circuit Based Detachable Sweat Patch for Noninvasive Biochemical and Biophysical Sensing

Technical Presentation: IMECE2023-119925
Jinghua Li - The Ohio State University

4:21PM
Effect of Magnesium Doping on Biomechanical Properties of PLA-Based Additive Manufactured Scaffolds

Technical Presentation: IMECE2023-119563
Fawad Ali - Hamad Bin Khalifa University
Ans Al Rashid - Hamad Bin Khalifa University
Sumama Nuthana Kalva - Hamad Bin Khalifa University
Muammer Koc - Hamad Bin Khalifa University

4:42PM
Non-Fluorinated, Fast-Curing, and Substrate-Independent Coating Provides Low Contact Angle Hysteresis for Water

Technical Presentation: IMECE2023-112274
Mohammadamin Ezazi - Georgia Southern University

5:03PM
Understanding Governing Physical Mechanism of Bio-Inspired Nanostructured Antifouling Coating

Technical Paper Publication: IMECE2023-113115
Akash Singh - University of Illinois at Urbana-Champaign
Yumeng Li - University of Illinois at Urbana-Champaign
04-27-02: Mechanics of Penetration, Shockwaves, and High-Strain-Rate Events: Modeling and Experiments
11/2/2023
4:00PM–5:45PM – ROOM 290

4:00PM
Influence of Bondline Thickness on the Performance of Adhesive Joints Under Ballistic Peel Impact

Technical Paper Publication: IMECE2023-113986
Gizem Derya Demir - The City College of New York
Salih Yildiz - The City College of New York
Ali Gursel - Duzce University
Kerim Tuna Iikikardaslar - The City College of New York
Feridun Delale - The City College of New York

4:21PM
Multiscale Mechanical Characterization of Ultraviolet-Degraded Polyurea

Technical Presentation: IMECE2023-120177
Amritesh Kumar - San Diego State University
George Youssef - San Diego State University

4:42PM
Development of Representative Volume Element for Electromagnetic Characterization of a Heterogenous Geomaterial

Technical Paper Publication: IMECE2023-111758
Patrick Camacho - Mississippi State University
J. Logan Betts - Mississippi State University
Matthew Priddy - Mississippi State University

5:03PM
Prediction of Concrete Mechanical Properties Through Multiscale Modeling

Technical Presentation: IMECE2023-120305
Andrew Bowman - U.S. Army Engineer Research and Development Center
Mei Chandler - U.S. Army Engineer Research and Development Center
William Lawrimore - U.S. Army Engineer Research and Development Center
Track 5: Advances in Aerospace Technology

Topics:
5-1: General Aerospace
5-2: Advances in Aerodynamics
5-3: Novel Aerospace Propulsion Systems
5-4: Advances in Aerospace Structures and Materials
5-5: Beam, Plate, and Shell Structures
5-6: Lightweight Sandwich Composites and Layered Structures
5-7: Dynamic Behavior of Composites
5-8: Dynamics and Control of Aerospace Structures
5-9: Materials and Structures for Extreme Environments
5-10: Impact, Damage and Fracture of Composite Structures
5-11: Advances in Mechanics, Multiscale Models, and Experimental Techniques for Composites
5-12: Peridynamics Modeling
5-13: Computational Aerospace Structural Dynamics and Aeroelasticity
5-14: Congress-Wide Symposium on NDE & SHM – NDE and Prognostics in Structural Applications
5-15: Advanced Manufacturing in Aerospace Engineering
5-16: Applications of Artificial Intelligence/Machine Learning in Aerospace Engineering
5-17: Multifunctional Composite Materials and Structures

ACKNOWLEDGMENT

TOPIC ORGANIZERS:

Ali Najafi, ANSYS, Inc.
Baoxing Xu, University of Virginia
Caglar Oskay, Vanderbilt University
Carlos Xisto
Christopher Billings, The University of Oklahoma
Dianyun Zhang, Purdue University
Erdogan Madenci, The University of Arizona
Erkan Oterkus, University of Strathclyde
Fang Jiang
Francisco Brojo, University of Beira Interior
George Kardomeas, Georgia Institute of Technology
Ibrahim Guven, Virginia Commonwealth University
Jakson Monteiro
Jinwei Shen
Jorge Gregório
José Páscoa
Kawai Kwok
Kwak-Tze Tan, The University of Akron
Michele Trancossi
Minghe Li, Georgia Institute of Technology
Nikolaos I. Xiros, The University of New Orleans
Olesya Zhupanska, The University of Arizona
Paulo Figueiredo
Phillip Deierling
Pinar Acar, Virginia Tech
Shanmugam Kumar
Uttam Chakravartty, The University of New Orleans
Wei Zhao, Oklahoma State University
Weiyi Lu, Michigan State University
Xiang Zhang, University of Wyoming
Xin Liu, The University of Texas at Arlington
Xin Ning, The Pennsylvania State University
Xin-Lin Gao, Southern Methodist University
Yang Liu, The City College of New York

TRACK ORGANIZERS

Track Organizer: Zhangxian Yuan, Worcester Polytechnic Institute
Track Co-Organizer: Yi Wang, University of South Carolina
Yeqing Wang, Syracuse University
Yi Wang, University of South Carolina
Yingtao Liu, The University of Oklahoma
Yiska Goldfeld
Yongming Liu, Arizona State University
Zhangxian Yuan, Worcester Polytechnic Institute

SESSION CHAIRS:

Dianyun Zhang, Purdue University
Erdogan Madenci, The University of Arizona
Erkan Oterkus, University of Strathclyde
Francisco Brojo, University of Beira Interior
George Kardomeatas, Georgia Institute of Technology
Gongye Zhang, Southeast University
Ibrahim Guven, Virginia Commonwealth University
Kwek-Tze Tan, The University of Akron
Olesya Zhupanska, The University of Arizona
Pinar Acar, Virginia Tech
Uttam Chakravarty, The University of New Orleans
Wei Zhao, Oklahoma State University
Weihua Su, The University of Alabama
Wei Li, Michigan State University
Xin Liu, The University of Texas at Arlington
Xin Ning, The Pennsylvania State University
Xin-Lin Gao, Southern Methodist University
Yi Wang, University of South Carolina
Yingtao Liu, The University of Oklahoma
Yongming Liu, Arizona State University
Yumeng Li, University of Illinois at Urbana-Champaign
Zhangxian Yuan, Worcester Polytechnic Institute

TRACK 5: ADVANCES IN AEROSPACE TECHNOLOGY
MONDAY, OCTOBER 30

05-01-01: GENERAL AEROSPACE
10/30/2023
10:45AM–12:30PM – ROOM 263

10:45AM
Modeling UAM Thermal Management Systems Swap Tradeoffs

Technical Presentation: IMECE2023-113612
Ahmed Abuheiba - Honeywell Rocky Research
Isaac Mahderekal - Honeywell Rocky Research

11:06AM
Development and Aerodynamic Performance of an Axisymmetric-Sector Inertial Particle Separator Wind Tunnel

Technical Paper Publication: IMECE2023-111752
Cesar Rodriguez-Saenz - University of Virginia
Eric Loth - University of Virginia
11:27AM
Investigating the Start-Up Structures and Their Evolution Within an Under-Expanded Jet Flows

Technical Paper Publication: IMECE2023-113767
Dehua Feng - North Carolina A&T State University
Frederick Ferguson - North Carolina A&T State University
Yang Gao - North Carolina A&T State University
Xinru Niu - North Carolina A&T State University

11:48AM
Supercharging of a 4-Stroke Spark Ignition Junkers Engine

Technical Paper Publication: IMECE2023-113850
Francisco Brojo - Universidade da Beira Interior
José Abreu - C-MAST

12:09PM
eVTOL UAV Conversion to Hydrogen Fuel-Cell Power Source for Enhanced Endurance

Technical Paper Publication: IMECE2023-115118
Nouf Almesafri - Technology Innovation Institute
Majed Alhammadi - Technology Innovation Institute
Sayem Zafar - Technology Innovation Institute
Gustavo Dos Santos - Technology Innovation Institute

05-11-01: ADVANCES IN MECHANICS, MULTISCALE MODELS, AND EXPERIMENTAL TECHNIQUES FOR COMPOSITES
10/30/2023
10:45AM–12:30PM – ROOM 292

10:45
Recent Developments in Mechanics of Structure Genome Technical Presentation: IMECE2023-120252
Wenbin Yu - Purdue University

11:27AM
Interactive Mechanisms of Delamination and In-Plane Failure Modes Revealed From Digital Volume Correlation-Assisted In Situ Tensile Test on a Single Edge-Notched Cross-Ply Laminate

Technical Presentation: IMECE2023-120136
Chaeyoung Hong - Ulsan National Institute of Science and Technology
Wooseok Ji - Ulsan National Institute of Science and Technology

11:48AM
Experimental Investigation on the Compression Response of Origami-Inspired Axial-Torsion Coupling Tubes

Technical Presentation: IMECE2023-119371
Colin Hunter - University of Michigan
Avinkrishnan Ambika Vijayachandran - University of Michigan
Royan D’mello - University of Michigan
Anthony Waas - University of Michigan
12:09PM

Electric Field Effects in Fiber Reinforced Polymer Matrix Composite Structures: From Low-Field Damage Sensing to High-Field Lightning Protection Applications

Technical Presentation: IMECE2023-120476
Olesya Zhupanska - The University of Arizona

05-04-01: ADVANCES IN AEROSPACE STRUCTURES AND MATERIALS
10/30/2023
2:00PM–3:45PM – ROOM 263

2:00PM

Inverse Design for Crystal Plasticity Model Calibration of Ti-7Al Alloy With Physics-Informed Machine Learning

Technical Presentation: IMECE2023-119751
Zekeriya Ender Eger - Virginia Tech
Pinar Acar - Virginia Tech

2:21PM

Energy-Absorption and Stiffening Concepts in Design of Aircraft Fuselage Structures

Technical Presentation: IMECE2023-120019
Mohsen Jafari - Wichita State University
Hamid Lankarani - Wichita State University
D v Suresh Koppisetty - Wichita State University
Mohammad Amin Ahouei - Wichita State University

2:42PM

Thermal Buckling Analysis and Optimization of Advanced Tow-Steered Laminates

Technical Presentation: IMECE2023-120159
Wei Zhao - Oklahoma State University

3:03PM

Virtual Allowables for Composites Using Mechanics of Structure Genome-Based Multiscale Modeling
Technical Presentation: IMECE2023-120259
Wenbin Yu - Purdue University
Haodong Du - Purdue University

3:24PM

Origami-Inspired Cylindrical Structures for Energy Absorption in Aerospace Applications
Technical Paper Publication: IMECE2023-113488
Khaja Fayaz Hussain - Khalifa University
Wesley Cantwell - Khalifa University
Kamran Khan - Khalifa University

05-12-01: PERIDYNAMICS MODELING
10/30/2023
2:00PM–3:45PM – ROOM 292

2:00PM

An Extended Peridynamics Model for Non-Spherical Horizons

Technical Presentation: IMECE2023-119710
Qibang Liu - University of Illinois at Urbana-Champaign
Muhao Chen - Texas A&M University
Robert Skelton - Texas A&M University

2:21PM

Three-Dimensional Peridynamic Modeling for High Velocity Impact of Arbitrary Shape Particles of Cold Spray Process

Technical Presentation: IMECE2023-120049
Erdogan Madenci - The University of Arizona
Sundaram Vinod Kumar Anicode - The University of Arizona
Yanan Zhang - The University of Arizona
2:42PM
A Non-Ordinary State-Based Viscoelastic Peridynamic Computational Homogenisation Model to Calculate the Effective Properties of Viscoelastic Composite Materials
Technical Presentation: IMECE2023-120058
Yakubu Kasimu Galadima - University of Strathclyde
Erkan Oterkus - University of Strathclyde
Selda Oterkus - University of Strathclyde

3:03PM
Fast Fourier Transform Method in Peridynamic Micromechanics of Composites
Technical Paper Publication: IMECE2023-112017
Valeriy Buryachenko - Micromechanics & Composites LLC

4:21PM
A Reduced Order Model for Static and Buckling Analysis of Thin-Walled Stiffened Plate on a Non-Conformal Mesh
Technical Paper Publication: IMECE2023-113162
Fatemeh Hashemian - University of South Carolina
Wei Zhao - Oklahoma State University
Yi Wang - University of South Carolina

4:21PM
Thermally Induced Redistributions of Free Carriers in Centrosymmetric Flexoelectric Semiconductor Beams
Technical Presentation: IMECE2023-114145
Gongye Zhang - Southeast University
Xin-Lin Gao - Southern Methodist University

4:42PM
New Analytical Model for Thermomechanical Responses of Multi-Layered Structures With Imperfect Interfaces
Technical Presentation: IMECE2023-114030
Mohamed Shaat - Southern Methodist University
Xin-Lin Gao - Southern Methodist University
Ke Li - Schlumberger Technology Corp.

5:03PM
A New Homogenization Method for Cellular Metamaterials Based on the Micropolar Elasticity Theory
Technical Presentation: IMECE2023-120213
Ahmad Gad - Alcon Vision
Xin-Lin Gao - Southern Methodist University

5:24PM
Hybrid Isotropic Architected Foams With Enhanced Energy Absorption
Technical Presentation: IMECE2023-119886
Huan Jiang - University of Colorado Denver
05-12-02: PERIDYNAMICS MODELING
10/30/2023
4:00PM–5:45PM – ROOM 292

4:00PM
A User Defined Element for Coupled Bond/state-Based Peridynamic and Finite Element Analysis in Ansys Framework

Technical Presentation: IMECE2023-120304
Erdogan Madenci - The University of Arizona
Atila Barut - Global Engineering Research and Technologies
Nam Phan - NAVAIR

4:21PM
Analysis of Welding Process by Using Thermomechanical Phase Change Peridynamic Model

Technical Presentation: IMECE2023-120051
Bingquan Wang - University of Strathclyde
Selda Oterkus - University of Strathclyde
Erkan Oterkus - University of Strathclyde

4:42PM
Peridynamic Micromechanics of Composites: Opportunities and Prospects

Technical Paper Publication: IMECE2023-112840
Valeriy A. Buryachenko - Micromechanics & Composites LLC

5:03PM
An Environmental Barrier Coating to Mitigate Ignition-Risk in High Pressure Oxygen-Rich Environments of Staged Combustion Rocket Engines

Technical Presentation: IMECE2023-119629
Isha Gupta - Massachusetts Institute of Technology
Spencer Taylor - Massachusetts Institute of Technology
Christopher Kiel - Massachusetts Institute of Technology
Andres Garcia-Jimenez - Massachusetts Institute of Technology
Zachary Cordero - Massachusetts Institute of Technology
TUESDAY, OCTOBER 31

05-08-01: DYNAMICS AND CONTROL OF AEROSPACE STRUCTURES
10/31/2023
10:15AM–12:00PM – ROOM 264

10:15AM
Modelling of a Drone to Analyze Dynamic Instabilities With its Delivery System

Technical Paper Publication: IMECE2023-116608
Eleazar Marquez - The University of Texas Rio Grande Valley
Ivan Luna - The University of Texas Rio Grande Valley

11:18AM
Effects of Various Baffle Designs on Center of Gravity Deviation in a Training Aircraft Wing Fuel Tank Using 1D Simulations

Technical Paper Publication: IMECE2023-115021
Kerem Karahan - Istanbul Technical University
Sertac Cadirci - Istanbul Technical University

11:39AM
Linear Parameter-Varying Models for Coupled Nonlinear Aeroelasticity and Flight Dynamics of Highly Flexible Aircraft

Technical Presentation: IMECE2023-120244
Weihua Su - The University of Alabama

05-07-01: ADVANCED MANUFACTURING AND MECHANICAL BEHAVIOR OF COMPOSITES
10/31/2023
10:15AM–12:00PM – ROOM 265

10:15AM
Energy Mitigation Mechanism of Liquid Nanofoam: Liquid Infiltration or Nanopore Wall Buckling?

Technical Presentation: IMECE2023-119797
Mingzhe Li - Georgia Institute of Technology
Anqi Zheng - Michigan State University
Weiyi Lu - Michigan State University

10:57AM
Fluid-Structure Interaction Model of a Wind Turbine Blade

Technical Paper Publication: IMECE2023-111772
Gazi Raihan - The University of New Orleans
Uttam Chakravarty - The University of New Orleans
10:36AM
A New Toughening Mechanism for Hydrogel: Nanoporous Media Functionalized Water Molecules for Biotissue Regeneration

Technical Presentation: IMECE2023-119582
Chi Zhan - Michigan State University
Mingzhe Li - Georgia Institute of Technology
Yun Liang - Michigan State University
Weiyi Lu - Michigan State University

10:57AM
Strong Interaction Between Liquid Suspension of Hollow Glass Microsphere and Thin-Walled Tube Under Uniaxial Compression

Technical Presentation: IMECE2023-119684
Fuming Yang - Michigan State University
Mingzhe Li - Georgia Institute of Technology
Robert McCoy - Ford Motor Company
Weiyi Lu - Michigan State University

11:18AM
Advanced Manufacturing of Duocel Metal Foams With Controlled Pore Topologies

Technical Presentation: IMECE2023-120118
Janith Godakawela - Michigan Technological University
Jake Puppo - ERG Aerospace Corporation
Bhisham Sharma - Michigan Technological University
Denver Schafferzick - ERG Aerospace Corporation

11:39AM
Out-of-Autoclave Process for the Fabrication of an Aircraft Window Frame Using Recycled LM/PAEK Thermoplastic Composites

Technical Presentation: IMECE2023-119777
Minsu Park - Ulsan National Institute of Science and Technology
Wooseok Ji - Ulsan National Institute of Science and Technology
Young-Bin Park - Ulsan National Institute of Science and Technology
Seong-Woo Im - Ulsan National Institute of Science and Technology
Soo-Chang Kang - Ulsan National Institute of Science and Technology
Gyu-Eun Cho - Ulsan National Institute of Science and Technology
05-16-01: APPLICATIONS OF ARTIFICIAL INTELLIGENCE/MACHINE LEARNING IN AEROSPACE ENGINEERING
10/31/2023
2:00PM–3:45PM – ROOM 264

2:00PM
Neural Networks for the Analysis of GNSS Data Applied to Positioning, and Attitude Determination
Technical Presentation: IMECE2023-112985
Raul De Celis - Rey Juan Carlos University

2:21PM
Application of Sparse Identification of Nonlinear Dynamical Systems to Nonlinear Aeroelastic Problems
Technical Presentation: IMECE2023-119407
Zahra Sotoudeh - California State Polytechnic University, Pomona
Ziyin Yuan - California State Polytechnic University, Pomona

2:42PM
Size-Objective Micromechanics Model Trained With Datasets Based on a Fiber Pair and Surrounding Fibers
Technical Presentation: IMECE2023-119755
Chaeyoung Hong - Ulsan National Institute of Science and Technology
Wooseok Ji - Ulsan National Institute of Science and Technology

3:03PM
The Role of Microtextured Regions in the Dwell Fatigue of Ti6242: A Combined High-Resolution Digital Image Correlation and Machine Learning Approach
Technical Presentation: IMECE2023-119873
Michelle Harr - University of Michigan
Adam Pilchak - Air Force Research Laboratory
Samantha Daly - University of California, Santa Barbara

05-06-01: LIGHTWEIGHT SANDWICH COMPOSITES AND LAYERED STRUCTURES
10/31/2023
2:00PM–3:45PM – ROOM 290

2:00PM
The Effect of Large Deflections on the Energy Release Rate and Mode Partitioning of Face/core Debonds in Sandwich Composites
Technical Presentation: IMECE2023-120197
George Kardomateas - Georgia Institute of Technology
Daniel Okegbu - Georgia Institute of Technology

2:21PM
Bending Behavior of Sandwich Panels With Folded Core
Technical Presentation: IMECE2023-120320
Kerim Dovletov - Worcester Polytechnic Institute
Zhangxian Yuan - Worcester Polytechnic Institute
2:42PM

Lightweight Design With Topology Optimization for Additive Manufacturing of Aircraft Components

Technical Paper Publication: IMECE2023-111362
Tae-Uk Kim - Korea Aerospace Research Institute

3:03PM

Efficient Modeling of Blades via Beam Element in the Multi-Objective Optimization of Small Wind Turbine Blades

Technical Paper Publication (Iran) : IMECE2023-113348
Altan Kayran - Middle East Technical University
Demirkan Çöker - Middle East Technical University
Can Muyan - Middle East Technical University
Onur Ali Batmaz - Middle East Technical University
Abolfazl Pourrajabian - Department of Energy, Materials and Energy Research Center
David Wood - University of Calgary

3:24

Development of the Magneto-Active Slosh Control System for Spacecraft and Launch Vehicle

Technical Presentation: IMECE2023-113835
Sathya Gangadharan - Embry-Riddle Aeronautical University

05-16-02: APPLICATIONS OF ARTIFICIAL INTELLIGENCE/MACHINE LEARNING IN AEROSPACE ENGINEERING

10/31/2023

4:00PM–5:45PM – ROOM 275

4:00PM

Adaptive Surrogate Models With Unbalanced Data for Material Design

Technical Presentation: IMECE2023-120346
Yulun Wu - University of Illinois at Urbana-Champaign
Yumeng Li - University of Illinois at Urbana-Champaign

4:21PM

Generative Adversarial Networks Guided Lightweight Design Based on Shakedown Strength Constraint

Technical Paper Publication: IMECE2023-114373
Songhua Huang - Xi'an Jiaotong University
Lele Zhang - Beijing Jiaotong University
Min Chen - Xi'an Jiaotong-Liverpool University
Zhiyuan Liu – Xi'an Jiaotong University
Eng Gee Lim - Xi'an Jiaotong-Liverpool University

4:42PM

Research on Health Monitoring and Prediction Technology for Civil Aircraft Environmental Control Systems: A Review

Technical Paper Publication: IMECE2023-116514
Jin Zhao - Northwestern Polytechnical University
Cunbao Ma - Northwestern Polytechnical University
Zhiyu She - Northwestern Polytechnical University
5:03PM

Trustworthy Machine Learning Classification of Acoustic Emissions for Damage Detection in SiC/SiC Composites

Technical Presentation: IMECE2023-119869
Caelin Muir - University of California, Santa Barbara
Nick Tulshibagwale - University of California, Santa Barbara
Andrew Furst - University of California, Santa Barbara
Michael Presby - NASA Glenn Research Center
Tresa Pollock - University of California, Santa Barbara
Amjad Almansour - NASA Glenn Research Center
Kathleen Sevener - University of Michigan
J. Doug Kiser - NASA Glenn Research Center
Craig Smith - NASA Glenn Research Center
Samantha Daly - University of California, Santa Barbara

4:21PM

Predicting Failure in Composite Structures Using Data-Driven Modeling Approach

Technical Presentation: IMECE2023-119866
Kwek Tze Tan - The University of Akron

4:42

Delamination Reinitiation From a BVID in CFRP

Technical Presentation: IMECE2023-119994
Kais Jribi - Embry-Riddle Aeronautical University
Alberto Mello - Embry-Riddle Aeronautical University
Boutros Azizi - Embry-Riddle Aeronautical University

5:03PM

Prediction of Delamination Location in Composite Structures With Different Ply Orientations: A Framework Integrating Finite Element Simulation and Deep Learning

Technical Paper Publication: IMECE2023-112407
Junyan He - ANSYS, Inc.
Linqi Zhuang - ANSYS, Inc.
Adarsh Chaurasia - ANSYS, Inc.
Ali Najafi - ANSYS, Inc.

05-10-01: COMPOSITE STRUCTURES: RESPONSE AND FAILURE
10/31/2023
4:00PM–5:45PM – ROOM 290

4:00PM

Thermal Simulations of a Composite Grid Structure Boom for Small Satellites

Technical Paper Publication: IMECE2023-113298
Roberto Scigliano - Italian Aerospace Research Center - CIRA
Valeria De Simone - Italian Aerospace Research Center - CIRA
Giovanni Totaro - Italian Aerospace Research Center - CIRA
Track 6: Biomedical and Biotechnology Engineering

Topics:
6-1: Injury and Damage Biomechanics
6-2: Vibration and Acoustics in Biomedical Applications
6-3: Biomedical Imaging, Therapy, and Tissue Characterization
6-4: Biomaterials and Tissue: Modelling, Synthesis, Fabrication, and Characterization
6-5: Biomedical Devices
6-6: Dynamics and Control of Biomechanical Systems
6-7: Symposium on Clinical Applications of Bioengineering
6-8: Biotransport (Fluid, Heat, and Mass)
6-9: Computational Modeling in Biomedical Applications
6-10: Musculoskeletal and Sports Biomechanics
6-11: Sensors and Actuators
6-12: Robotics, Rehabilitation
6-13: Bio Artificial Intelligence
6-14: Biotechnology and General Applications
6-15: Novel Verification, Validation, and Uncertainty Quantification (VVUQ) Techniques and Approaches for Biomedical and Biotechnology Applications

ACKNOWLEDGMENT

TRACK ORGANIZERS
Track Organizer: Yi (Jason) Hua, University of Mississippi
Track Co-Organizer: Yuan Feng, Shanghai Jiao Tong University
Track Co-Organizer: Linxia Gu, Florida Institute of Technology
Track Co-Organizer: Ahmed Al-Jumaily, Auckland University of Technology

TOPIC ORGANIZERS:
Ahmed Al-Jumaily, Auckland University of Technology
Amit Bagchi, U.S. Naval Research Laboratory
Anil Saigal, Tufts University
Anne Schmitz, University of Wisconsin-Stout
Asheesh Lanba, University of Southern Maine
Bin Zi
Bogdan Epureanu, University of Michigan
Cahit Evrensel, University of Nevada, Reno
Davide Piovesan, Gannon University
Douglas Dow
Dumitru Caruntu, The University of Texas-Rio Grande Valley
Hai-Chao Han, The University of Texas at San Antonio
Julie Hao
Kalyani Nair
Karen Chang Yan, The College of New Jersey
Karim Muci-Kuchler, Texas State University
Kevin Dowding, Sandia National Laboratories
Lulu Wang, Shenzhen Technology University
Mandar Kulkarni
Maurizio Manzo, University of North Texas
Michelle Pagano, ASME
Mohammad Al-Rawi, Te Pūkenga - Waikato Institute of Technology
Parisa Saboori
Peyman Honarmandi
Ping Zhao, Hefei University of Technology
Ramjee Repaka, Indian Institute of Technology Ropar
Reuben Kraft, Penn State
Roozbeh (Ross) Salary, Marshall University
Seyed Allameh, Northern Kentucky University
Takashi Saito, Yamaguchi University
Toshihiko Shiraiishi, Yokohama National University
Tung Vuong
Violeta Carvalho, Universidade do Minho
X. Gary Tan, U.S. Naval Research Laboratory
Yingtao Liu, The University of Oklahoma
Yuan Feng, Shanghai Jiao Tong University
Session Chairs:
Ahmed Al-Jumaily, Auckland University of Technology
Amit Bagchi, U.S. Naval Research Laboratory
Anil Saigal, Tufts University
Bin Zi
Bogdan Epureanu, University of Michigan
Cahit Evrensel, University of Nevada, Reno
Davide Piovesan, Gannon University
Dumitru Caruntu, The University of Texas-Rio Grande Valley
Hai-Chao Han, The University of Texas at San Antonio
Karen Chang Yan, The College of New Jersey
Karim Muci-Kuchler, Texas State University
Linxia Gu, Florida Institute of Technology
Lulu Wang, Shenzhen Technology University
Mandar Kulkarni
Maurizio Manzo, University of North Texas
Mohammad Al-Rawi, Te Pūkenga - Waikato Institute of Technology
Ping Zhao, Hefei University of Technology
Ramjee Repaka, Indian Institute of Technology Ropar
Reuben Kraft, Penn State
Roozbeh (Ross) Salary, Marshall University
Seyed Allameh, Northern Kentucky University
Takashi Saito, Yamaguchi University
Toshihiko Shiraishi, Yokohama National University
Tung Vuong
Vimal Viswanathan, San Jose State University
Violeta Carvalho, Universidade do Minho
X. Gary Tan, U.S. Naval Research Laboratory
Yen-Lin Han, Seattle University
Yi Hua, University of Pittsburgh
Yingtao Liu, The University of Oklahoma
Yuan Feng, Shanghai Jiao Tong University
Zhengwei Li, University of Houston
Zhili Hao, Old Dominion University

TRACK 6: BIOMEDICAL & BIOTECHNOLOGY ENGINEERING
TUESDAY, OCTOBER 31

06-01-01: INJURY AND DAMAGE BIOMECHANICS - TRAUMATIC BRAIN INJURY AND HEAD IMPACT STUDIES
10/31/2023
10:15AM–12:00PM – ROOM 266

10:15AM
Dynamic Similarity of Human Head Surrogate Models With Biological Material Models Under Dynamic Loading Conditions

Technical Presentation: IMECE2023-120225
Arthur Koster - The University of Texas at Arlington
Ashfaq Adnan - The University of Texas at Arlington

10:36AM
Numerical Investigation of Impulse Noise Propagation Into the Human Head

Technical Presentation: IMECE2023-120402
X. Gary Tan - U.S. Naval Research Laboratory
Yungchia Chen - U.S. Naval Research Laboratory
Amit Bagchi - U.S. Naval Research Laboratory
Michael Doherty - U.S. Naval Research Laboratory
Kirubel Tefera - U.S. Naval Research Laboratory
John O'Donnell - U.S. Naval Research Laboratory

10:57AM
Biomechanical Analysis of Interaction of Blast Wave With Human Head

Technical Presentation: IMECE2023-120103
Shailesh Ganpule - Indian Institute of Technology Roorkee
TECHNICAL SESSIONS

11:18AM
A Novel Head Model Incorporating Translational Acceleration Impact to Understand and Advance Traumatic Brain Injury Research

Technical Presentation: IMECE2023-120086
Raisa Akhtaruzzaman - The University of Texas at Arlington
Ashfaq Adnan - The University of Texas at Arlington
Kamal Awad - The University of Texas at Arlington
Venu G Varanasi - The University of Texas at Arlington
Arthur Thomas Koster - The University of Texas at Arlington
Marco Brotto - The University of Texas at Arlington

11:39AM
Game Changer: Linking Computational Brain Injury Metrics and Concussion Symptoms in American College Football

Technical Presentation: IMECE2023-119794
Ritika Menghani - The Pennsylvania State University
Clayton Bardall - Western Carolina University
Martin Tanaka - Western Carolina University
Reuben Kraft - The Pennsylvania State University

2:21PM
Vibration-Induced Rupture of Membranes for Wound Healing and Smart Bandages

Technical Presentation: IMECE2023-119903
Praj Patel - Rutgers University
Stephen McLaughlin - Rutgers University
Ali Ashraf - Rutgers University
Francois Berthiaume - Rutgers University
Aaron Mazzeo - Rutgers University

2:42PM
Effect of Measurement Location on Cardiac Time Intervals Estimated by Seismocardiography

Technical Paper Publication: IMECE2023-112702
Aysha Mann - Mississippi State University
Bahram Kakavand - Nemours Children’s Hospital
Peshala Thibbotuwawa Gamage - Florida Institute of Technology
Amirtahá Taebi - Mississippi State University

3:03PM
Methodology to Optimize the Location of Osteosynthesis Material for 3D Printed Cranial Implants Based on Force Analysis

Technical Paper Publication: IMECE2023-109336
Bryan S. Perero Segarra - Escuela Superior Politécnica del Litoral
Carlos G. Helguero - Escuela Superior Politécnica del Litoral
Fausto Maldonado - Escuela Superior Politécnica del Litoral
Jorge Luis Amaya R. - Escuela Superior Politécnica del Litoral
Carlos Saldarriaga - Escuela Superior Politécnica del Litoral
Francis Loayza - Escuela Superior Politécnica del Litoral
TECHNICAL SESSIONS

06-01-02: INJURY AND DAMAGE BIOMECHANICS - EXPERIMENTAL AND COMPUTATIONAL APPROACHES IN BRAIN INJURY RESEARCH
10/31/2023
2:00PM–3:45PM – ROOM 266

2:00PM
Effects of Experimental Variation on Cell Health for Live Human Cells Subject to Translational Acceleration

Technical Presentation: IMECE2023-120228
Arthur Koster - The University of Texas at Arlington
Raisa Akhtaruzzaman - The University of Texas at Arlington
Ashfaq Adnan - The University of Texas at Arlington

2:21PM
Mechanical Behavior of Bilayer Myelin Sheath: A Molecular Dynamics Simulation Study

Technical Presentation: IMECE2023-120029
Fairuz Maliha - The University of Texas at Arlington
Sheikh Ferdous - Penn State Harrisburg
Ashfaq Adnan - The University of Texas at Arlington

2:42PM
Demonstration of a Fully-Automated Workflow for a Subject-Specific Human Digital Twin for Traumatic Brain Injury Risk Assessment

Technical Presentation: IMECE2023-119896
Anu Tripathi - Robert Morris University
Yaohui Wang - Robert Morris University
Rika Carlsen - Robert Morris University
Emma Lejeune - Boston University
Chad Hovey - Sandia National Laboratories

3:03PM
From Rats to Humans: A Biomechanical-Based Approach to Estimate Equivalent Blast-Induced Outcomes in the Brain

Technical Presentation: IMECE2023-119705
Jose Enrique Rubio - United States Army Medical Research and Development Command
Dhananjay Radhakrishnan Subramaniam - United States Army Medical Research and Development Command
Ginu Unnikrishnan - United States Army Medical Research and Development Command
Venkata Siva Sai Sujith Sajja - Walter Reed Army Institute of Research
Stephen Van Albert - Walter Reed Army Institute of Research
Franco Rossetti - Walter Reed Army Institute of Research
Andrew Frock - United States Army Medical Research and Development Command
Giang Nguyen - United States Army Medical Research and Development Command
Aravind Sundaramurthy - United States Army Medical Research and Development Command
Joseph B. Long - Walter Reed Army Institute of Research
Jaques Reifman - United States Army Medical Research and Development Command

3:24PM
Potential for Traumatic Brain Injury From a Rapid Change in Temperature

Technical Presentation: IMECE2023-114359
Justin Wilkerson - Texas A&M University
06-03-01: BIOMEDICAL IMAGING, THERAPY AND TISSUE CHARACTERIZATION
10/31/2023
4:00PM–5:45PM – ROOM 265

4:00PM
Computation of Data Geometric Structures of Oct Images in Medical Ophthalmology by Advanced Proper Orthogonal Decompositions and Projections of Tensor Data Clouds

Technical Presentation: IMECE2023-117259
Ioannis Georgiou - National Technical University of Athens

4:21PM
Characterization of Internal Stress of Soft Tissue Using Magnetic Resonance Elastography

Technical Presentation: IMECE2023-111667
Yu Chen - Shanghai Jiao Tong University
Shengyuan Ma - Shanghai Jiao Tong University
Runke Wang - Shanghai Jiao Tong University
Zhao He - Shanghai Jiao Tong University
Ruokun Li - Shanghai Jiaotong University
Qingfang Sun - Shanghai Jiao Tong University
Fuhua Yan - Shanghai Jiaotong University
Guy Genin - Washington University in St. Louis
Guangzhong Yang - Shanghai Jiao Tong University
Yuan Feng - Shanghai Jiao Tong University

4:42PM
Holographic Terahertz Imaging for Breast Cancer Detection

Technical Paper Publication: IMECE2023-112926
Lulu Wang - Shenzhen Technology University
Mohammad Al-Rawi - Waikato Institute of Technology

5:03PM
Utilizing Neural Networks to Assist in the Assessment and Predictive Measurement of Developmental Hip Dysplasia Radiographs

Technical Paper Publication: IMECE2023-113658
Sheridan Perry - Embry-Riddle Aeronautical University
Matthew Folkmann - Rainbow Babies and Children’s Hospital
Takara O’Brien - Embry-Riddle Aeronautical University
Lauren Wilson - Embry-Riddle Aeronautical University
Eric Coyle - Embry-Riddle Aeronautical University
Raymond W. Liu - Rainbow Babies and Children’s Hospital
Charles T. Price - International Hip Dysplasia Institute
Victor Huayamove - Embry-Riddle Aeronautical University
06-01-03: Injury and Damage Biomechanics - Biomechanics and Modeling of Neural and Musculoskeletal Systems
10/31/2023
4:00PM–5:45PM – ROOM 266

4:00PM
Assessing Potential Disc Degeneration in Pilots Who Experience Intense Gravitational Forces
Technical Presentation: IMECE2023-112760
Ann Nicole Reyes Kadozono - The Pennsylvania State University
Timothy Dewitt - Air Force Research Laboratory
Reuben Kraft - The Pennsylvania State University

4:21PM
Development and Validation of Non-Human Primate Head-Neck Computational Model for Frontal Impact Injury Analysis
Technical Paper Publication: IMECE2023-109298
Jesse Gerringer - Marquette University and Medical College of Wisconsin
Karthik Somasundaram - Medical College of Wisconsin
Frank Pintar - Marquette University and Medical College of Wisconsin

4:42PM
Simulation and Experimental Validation of Alternate Pathways of Impulse Noise Conduction Into the Inner Ear
Technical Paper Publication: IMECE2023-112453
X. Gary Tan - U.S. Naval Research Laboratory
Yungchia Chen - U.S. Naval Research Laboratory
Thomas O’shaughnessy - U.S. Naval Research Laboratory

5:03PM
Comparison of External and Internal Load-Sharing Responses Between Posterior Cervical Foraminotomy and Conventional Fusion for Neck Injuries: A Finite Element Modeling Study
Technical Paper Publication: IMECE2023-112531
Hoon Choi - Cleveland Clinic Florida
Yuvaraj Purushothaman - Medical College of Wisconsin
Narayan Yoganandan - Medical College of Wisconsin

5:24PM
Stenotic Cervical Spinal Cord and Column Responses Under Whiplash Using a Finite Element Model
Technical Paper Publication: IMECE2023-114182
Narayan Yoganandan - Medical College of Wisconsin
Balaji Harinathan - Medical College of Wisconsin
Aditya Vedantam - Medical College of Wisconsin
WEDNESDAY, NOVEMBER 1

06-01-04: INJURY AND DAMAGE BIOMECHANICS - MEDICAL APPLICATIONS AND TISSUE DAMAGE STUDIES
11/1/2023
10:45AM–12:30PM – ROOM 270

10:45AM

CFD With Fluid Structure Interaction Analysis of Lung Alveolar Sacs and its Applications in Emphysema Study

Technical Paper Publication: IMECE2023-109534
Carlo Carotenuto - University of Modena and Reggio Emilia
Francesco Orlandi - University of Modena and Reggio Emilia
Luca Montorsi - University of Modena and Reggio Emilia
Massimo Milani - University of Modena and Reggio Emilia

11:06AM

Finite Element Analysis of Brain Damage Induced by the Impact of Hit-by-Pitch

Technical Paper Publication: IMECE2023-113313
Kohei Shimomura - Kyoto Institute of Technology
Motoharu Terai - Kyoto Institute of Technology
Atsushi Sakuma - Kyoto Institute of Technology
Yuelin Zhang - Sophia University

11:27AM

Histological Study of Tissue Damage due to Composite-Coated Needle Insertion

Technical Paper Publication: IMECE2023-113363
Kavi Patel - Temple University
Parsaoran Hutapea - Temple University

11:48AM

Structure-Reconsideration of Shell-Cushioning Materials of Helmet to Reduce the Impact Force of American Football Players by Finite Element Method

Technical Paper Publication: IMECE2023-116362
Motoharu Terai - Kyoto Institute of Technology
Kohei Shimomura - Kyoto Institute of Technology
Atsushi Sakuma - Kyoto Institute of Technology
Yuelin Zhang - Sophia University

06-04-01: BIOMATERIALS AND TISSUE: MODELLING, SYNTHESIS, FABRICATION, AND CHARACTERIZATION
11/1/2023
10:45AM–12:30PM – ROOM 271

10:45AM

Mesoporous Materials Made of Mixed-Grain With Mushroom Mycelia Reinforcement as an Alternative to Styrofoam

Technical Paper Publication: IMECE2023-113925
Shubhankar Desai - Gannon University
Vijay Javvaji - Gannon University
Rauf Mammadov - Gannon University
Ahmad Abu Zeid - Gannon University
Santosh V Angadi - Gannon University
Matthew Gacura - Gannon University
Gary Vanderlaan - Gannon University
Davide Piovesan - Gannon University
11:06AM
Damage Induced Softening of the Sclera: A Pseudo-Elastic Modeling Approach

Technical Paper Publication: IMECE2023-112270
Jose A. Colmenarez - Florida Institute of Technology
Yingnan Zhai - Florida Institute of Technology
Valentina O. Mendoza - Florida Institute of Technology
Pengfei Dong - Florida Institute of Technology
Kenia Nunes - Florida Institute of Technology
Donny Suh - University of California at Irvine
Linxia Gu - Florida Institute of Technology

11:27AM
Multiscale Mechanical Characterization of Cornea With AFM, SEM, and Uniaxial Tensile Test

Technical Paper Publication: IMECE2023-113394
Yingnan Zhai - Florida Institute of Technology
Jose Colmenarez - Florida Institute of Technology
Valentina Ochoa Mendoza - Florida Institute of Technology
Pengfei Dong - Florida Institute of Technology
Kenia Nunes - Florida Institute of Technology
Donny Suh - University of California at Irvine
Linxia Gu - Florida Institute of Technology

11:48AM
A Heterogenous Hydrogel Brain Phantom for Convection-Enhanced Drug Delivery

Technical Paper Publication: IMECE2023-113654
Rose Pineda - University of Nebraska-Lincoln
Sangjin Ryu - University of Nebraska-Lincoln
Seunghee Kim - University of Nebraska-Lincoln
Chi Zhang - University of Nebraska Medical Center

06-12-01: ROBOTICS, REHABILITATION
11/1/2023
10:45AM–12:30PM – ROOM 292

10:45AM
Rehabilitation Soft Robot for Stroke Patients With Clenched Fists

Technical Presentation: IMECE2023-119765
Yen-Lin Han - Seattle University
Matthew Baysa - Seattle University
Samuel Lund - Seattle University

11:06AM
Design and Fabrication of a Modular, Lightweight, and Portable Upper Limb Exoskeleton for Shoulder and Elbow

Technical Paper Publication: IMECE2023-114107
Nathanael Lacuata - San Jose State University
Brandon Odell - San Jose State University
Anthony John - San Jose State University
Cameron Pelletier - San Jose State University
David Jefferson - San Jose State University
Richard Lineberger - San Jose State University
Mojtaba Sharifi - San Jose State University

11:27AM
Development of a Bio-Chair Using Electromyographic Actuation for Rehabilitation Exercises

Technical Paper Publication: IMECE2023-114245
Pranav Bellannagari - IntelliScience Institute
Sohail Zaidi - San Jose State University
Vimal Viswanathan - San Jose State University
**TECHNICAL SESSIONS**

**11:48AM**

Development of 3D Printed Humanoid Robots

Technical Presentation: IMECE2023-120282
James Van Milligen - Worcester Polytechnic Institute
Zenia Alarcon - Worcester Polytechnic Institute
Emily Austin - Worcester Polytechnic Institute
Tessa Lytle - Worcester Polytechnic Institute
Aashish Singh Alag - Worcester Polytechnic Institute
Erin Lee - Worcester Polytechnic Institute
Casey Snow - Worcester Polytechnic Institute
Josh Fernandez - Worcester Polytechnic Institute
Finbar O'sullivan - Worcester Polytechnic Institute
Pradeep Radhakrishnan - Worcester Polytechnic Institute
Kaveh Pahlavan - Worcester Polytechnic Institute

**2:42PM**

A Computational Fluid Dynamics Approach for Hospitalization at Home During the Pandemic

Technical Paper Publication: IMECE2023-110371
Mohammad Al-Rawi - Waikato Institute of Technology
Lulu Wang - Shenzhen Technology University
Hong Zhou - Waikato Institute of Technology

**3:03PM**

Predicting Pressure Gradient in Aortic Coarctation Based on Geometrical Features Using Design of Experiments and Machine Learning Models

Technical Paper Publication (Iran): IMECE2023-117226
Alireza Asadbeygi - Michigan Technological University
Mohammad Amin Abazari - K. N. Toosi University of Technology
Mona Alimohammadi - K. N. Toosi University of Technology

---

**06-03-02: BIOMEDICAL IMAGING, THERAPY, AND TISSUE CHARACTERIZATION**

**11/1/2023**

2:00PM–3:45PM – ROOM 270

**2:00PM**

New Applications of Laser Ablation Tomography (LATscan) for Tissue Imaging

Technical Presentation: IMECE2023-116536
Asheesh Lanba - University of Southern Maine

**2:21PM**

Basic Research on Music Prescriptions - Second Experiment With Classical Music

Technical Paper Publication: IMECE2023-113358
Hirotoshi Hishida - Kogakuin University
Shigehiro Hashimoto - Kogakuin University
Kaito Saeki - Kogakuin University
Hikaru Kono - Kogakuin University

Keiko Hishida - Keiko’s Music Room
06-04-02: BIOMATERIALS AND TISSUE: MODELLING, SYNTHESIS, FABRICATION AND CHARACTERIZATION
11/1/2023
2:00PM–3:45PM – ROOM 271

2:00PM
Characterization of Macromolecule Diffusion of Electrospun (ES) Fibers Embedded in Microfluidic Devices

Technical Paper Publication: IMECE2023-114098
Karen Chang Yan - The College of New Jersey
Taniya Sood - The College of New Jersey
Raahi Desai - The College of New Jersey
Michael Merritt - The College of New Jersey

2:21PM
Synthesis of Poly-Lactic Acid by Ring Open Polymerization for Biomedical Applications

Technical Paper Publication: IMECE2023-113972
Snehal Reddy Vakati - Gannon University
Matthew Gacura - Gannon University
Gary Vanderlaan - Gannon University
Xiaoxu Ji - Gannon University
Longyan Chen - Gannon University
Christine Saber - Gannon University
Davide Piovesan - Gannon University

2:42PM
Printability Study of Short Electrospun Nanofiber-Hydrogel Composites

Technical Paper Publication: IMECE2023-114081
Karen Chang Yan - The College of New Jersey
Raahi Desai - The College of New Jersey
Tyler Griffin - The College of New Jersey
Taniya Sood - The College of New Jersey

3:03PM
Optimizing Material Properties for 3D Printing: A Study on Compressive Strength of Mixed Clear and Tough Resins

Technical Paper Publication: IMECE2023-113945
Vijay K. Javvaji - Gannon University
Santosh Angadi - Gannon University
Davide Piovesan - Gannon University

06-12-02: ROBOTICS, REHABILITATION
11/1/2023
2:00PM–3:45PM – ROOM 292

2:00PM
Modeling and Simulation of Robotic Palpation to Detect Subsurface Soft Tissue Anomaly for Presurgical Assessment

Technical Paper Publication: IMECE2023-111966
Abhinaba Bhattacharjee - Indiana University–Purdue University Indianapolis
M. Terry Loghmani - Indiana University–Purdue University Indianapolis
Sohel Anwar - Indiana University–Purdue University Indianapolis
TECHNICAL SESSIONS

2:21PM
A Sensor-Integrated Textile for the Acquisition of Upper Extremity Electromyographic Signals

Technical Paper Publication: IMECE2023-112239
Julian Ilg - Technical University Munich
Lukas Hinderer - Technical University Munich
Konstantin Struebig - Technical University Munich
Tim C. Lueth - Technical University Munich

2:42PM
On the Development and Evaluation of an Affordable Telerobotic System for Object Grasping for Human-Machine Interaction

Technical Paper Publication: IMECE2023-113074
Abdul Hafiz Abdul Rahaman - The University of Texas at Arlington
Sudip Hazra - The University of Texas at Arlington
Panos Shiakolas - The University of Texas At Arlington

3:03PM
Development of a Novel Hybrid Soft Cable-Driven Parallel Robot

Technical Paper Publication: IMECE2023-113598
Ammy Ovando - Kennesaw State University
Sky Papendorp - Kennesaw State University
Turaj Ashuri - Kennesaw State University
Amir Ali Amiri Moghadam - Kennesaw State University

3:24PM
Design and Fabrication of a Lightweight and Wearable Semi-Rigid Robotic Knee Chain Exoskeleton

Technical Paper Publication: IMECE2023-114420
Diego Rivera - San Jose State University
Mojtaba Sharifi - San Jose State University

4:00PM
Toward Scrubbing-Based Automatic Handwashing
Technical Presentation: IMECE2023-119917
Antonio Bu Sha - Rutgers University - New Brunswick
Aaron Mazzeo - Rutgers University

4:21PM
A Travelling Wave Ferro-Microfluidic Device Platform for Potential Cell Separation and Sorting

Technical Paper Publication: IMECE2023-109340
Rodward Hewlin - The University of North Carolina at Charlotte
Maegan Edwards - The University of North Carolina at Charlotte

4:42PM
System Identification Approach to Ocular Tactile Tonometry

Technical Paper Publication: IMECE2023-109444
Qiuchen Zhang - The University of Arizona
Eniko Enikov - The University of Arizona

5:03PM
A Model to Predict Deflection of an Active Tendon-Driven Notched Needle Inside Soft Tissue

Technical Paper Publication: IMECE2023-111812
Blayton Padasdao - University of Hawaii at Manoa
Bardia Konh - University of Hawaii at Manoa
5:24PM
Mechanics of Scorpion-Inspired Curved Tip Needle Moving in Soft Tissue
Technical Paper Publication: IMECE2023-111897
Doyoung Kim - Temple University
Parsaoran Hutapea - Temple University

06-09-04: COMPUTATIONAL MODELING IN BIOMEDICAL APPLICATIONS - IV
11/1/2023
4:00PM–5:45PM – ROOM 291

4:00PM
The Effect of Bone Mineral Density and Diameter of Implant Fixture on Osseointegration of Dental Implant Using Finite Element Analysis
Technical Presentation: IMECE2023-120102
Dongwon Kim - Hanyang University
Juhyun Nam - Hanyang University
Je Hoon Oh - Hanyang University

4:21PM
Computational Modelling of the Mechanics of Nitinol Guidewires in a Tortuous Path for Medical Device Applications
Technical Presentation: IMECE2023-119424
William Ronan - University of Galway
Donnacha McGrath - University of Galway
Reyhaneh Shirazi - University of Galway
Marie Clancy - Integer Holdings Corporation
Roger Dickenson - Integer Holdings Corporation
Peter McHugh - University of Galway

5:03PM
Computational Modeling of an Aortic Medial Ring: Effect of Residual Stresses on a Mechanical Behavior of the Aortic Ring
Technical Paper Publication: IMECE2023-112330
Atsutaka Tamura - Tottori University
Koki Matsumoto - Tottori University
Jun-Ichi Hongu - Tottori University

5:24PM
Finite Element Simulation of Compressing an Additively Manufactured Mesostructure
Technical Paper Publication: IMECE2023-108885
Anne Schmitz - University of Wisconsin-Stout
TECHNICAL SESSIONS

06-12-03: ROBOTICS, REHABILITATION
11/1/2023
4:00PM–5:45PM – ROOM 292

4:00PM
Development of Robotic Hand With Novel Soft 3D Printed Actuators

Technical Paper Publication: IMECE2023-113630
Kishan Patel - Kennesaw State University
Kyra Magee - Kennesaw State University
Bill Hoover - Kennesaw State University
Jason Yu - Kennesaw State University
Turaj Ashuri - Kennesaw State University
Amir Ali Amiri Moghadam - Kennesaw State University

4:21PM
Design and Experiments Involving a Mechanism-Based Artificial Tongue Prosthesis

Technical Paper Publication: IMECE2023-113831
Ace Holod - Worcester Polytechnic Institute
Nadia Singh - Worcester Polytechnic Institute
Xavier Curney - Worcester Polytechnic Institute
Pradeep Radhakrishnan - Worcester Polytechnic Institute
Kaveh Pahlavan - Worcester Polytechnic Institute

4:42PM
Development of an Assistive Ankle-Foot Exoskeleton With Sensorized Silicone-Based Insole

Technical Paper Publication: IMECE2023-114054
T.C. Cheng - San Jose State University
Mojtaba Sharifi - San Jose State University

5:03PM
Robot-Based Adaptive Training of a Repetitive Motion Shows the Potential to Outperform Transient, Passive. and Active Learning

Technical Paper Publication: IMECE2023-114072
Danzing Zhang - University of Detroit Mercy
Jonathan Weaver - University of Detroit Mercy

5:24PM
Living Hybrid Electronic Robots With Remote Control

Technical Presentation: IMECE2023-119813
Zhengwei Li - University of Houston
TECHNICAL SESSIONS

THURSDAY, NOVEMBER 2

06-05-02: BIOMEDICAL DEVICES
11/2/2023
10:15AM–12:00PM – ROOM 270

10:15AM
Electronic Failure of Small Implantable Devices due to Moisture Ingress Through a Medical Grade Epoxy
Technical Paper Publication: IMECE2023-112177
Simon Blue - University of Canterbury
Deborah Munro - University of Canterbury

10:36AM
Advancements in Assistive Devices for Para-Kayaking Sports
Technical Paper Publication: IMECE2023-112392
Christine Walck - Embry-Riddle Aeronautical University
Victor Huayamave - Embry-Riddle Aeronautical University
Monica Garcia - Embry-Riddle Aeronautical University
Paola Diaz-Portela - Embry-Riddle Aeronautical University
Besty Hernandez - Embry-Riddle Aeronautical University
Erin Ray - Embry-Riddle Aeronautical University
Din Le - Embry-Riddle Aeronautical University
James Palmer - Embry-Riddle Aeronautical University
Weston Randall - Embry-Riddle Aeronautical University

10:57AM
Feasibility of Trapezius Muscle Electromyography and Electrocardiography to Monitor Stress Levels in High Demand Positions
Technical Paper Publication: IMECE2023-112653
Mohammad Ahmed - Florida Institute of Technology
Mehmet Kaya - Florida Institute of Technology
Amir Taebi - Mississippi State University
Peshala Thibbotuwawa Gamage - Florida Institute of Technology

11:18AM
Design, Prototype, and Evaluation of a Low-Cost Multimodal Device for Cardiovascular Monitoring
Technical Paper Publication: IMECE2023-112486
Sophia Ruckman - Mississippi State University
Jigar Bhatt - Mississippi State University
Jadyn Cook - Mississippi State University
Peshala Thibbotuwawa Gamage - Florida Institute of Technology
Bahram Kakavand - Nemours Children’s Hospital
Amir Taebi - Mississippi State University

06-06-01: DYNAMICS AND CONTROL OF BIOMECHANICAL SYSTEMS
11/2/2023
10:15AM–12:00PM – ROOM 271

10:15AM
Effect of Foot Additional Mass on the Clinical Angles of Knee Extension Exercise
Technical Paper Publication: IMECE2023-113235
Dumitru Caruntu - The University of Texas Rio Grande Valley
Alfirio Trejo - The University of Texas Rio Grande Valley
Eric Rodriguez - The University of Texas Rio Grande Valley
Camila Tatiana Alvarez Barriga - The University of Texas Rio Grande Valley
10:36AM

Effect of Roll Rotation on Sway Displacement of Stewart Platform for Flight Simulation

Technical Paper Publication: IMECE2023-111514
Spencer Miller - Gannon University
Davide Piovesan - Gannon University
Irati Arzalluz - Gannon University
Xiaoxu Ji - Gannon University

10:57AM

Model-Based Assist-as-Needed Control on a Provisional Pediatric Lower-Limb Orthosis

Technical Paper Publication: IMECE2023-109505
Jason Wiebrecht - Cleveland State University
Jacob Strick - Cleveland State University
Anthony Goo - Cleveland State University
Jerzy Sawicki - Cleveland State University

11:18AM

Design and Development of ARDEL (Active-Assist Rehabilitation Device for Elbow

Technical Paper Publication: IMECE2023-114149
Shubhankar Desai - Gannon University
Davide Piovesan - Gannon University
Chaitali Dagli - The University of Alabama at Birmingham

10:36AM

Computational Analysis for Effects on Hemodynamic Parameters Based on the Location of Cerebral Aneurysms

Technical Paper Publication: IMECE2023-112164
Garigapuram Prithvinath Reddy - New York University
Srushti Katore - New York University
Vittoria Flamini - New York University
Iskender Sahin - New York University

10:57AM

Mesh Independency Analysis for Aorta Geometry Using a Computational Modelling Approach

Technical Paper Publication: IMECE2023-110446
Mohammad Al-Rawi - Waikato Institute of Technology
Djelloul Belkacemi - Hassiba Ben Bouali University Chlef
Ahmed Al-Jumaily - Auckland University of Technology

10:57AM

A Reduced Order Model for Estimation of Fractional Flow Reserve (FFR) in Coronary Artery Disease: Assessing the Impact of Side Branches

Technical Paper Publication: IMECE2023-112632
Arber Vila - Florida Institute of Technology
Mohammad Ahmed - Florida Institute of Technology
Amirtaha Taebi - Mississippi State University
Pengfei Dong - Florida Institute of Technology
Linxia Gu - Florida Institute of Technology
Peshala Thibbotuwawa Gamage - Florida Institute of Technology
A Comparative Study of Middle Cerebral Artery Hemodynamics Pre- and Post-Clipping of Cerebral Aneurysm

Technical Paper Publication: IMECE2023-112822
Haleigh Davidson - Mississippi State University
Brooke Scardino - Mississippi State University
Luke Hollingsworth - Mississippi State University & Mississippi School for Mathematics and Science
Peshala Thibbotuwawa Gamage - Florida Institute of Technology
Amirtah Toebi - Mississippi State University

Development of a Multilayer Numerical Model for Simulating Honeybee Stinger Inspired Hollow Needle Insertion Into the Iliac Crest

Technical Paper Publication: IMECE2023-116560
Rahul Nadda - Indian Institute of Technology Ropar
Ramjee Repaka - Indian Institute of Technology Ropar
Ashish Kumar Sahani - Indian Institute of Technology Ropar

Upper Body Joint Angle Calculation and Analysis Using Multiple Inertial Measurement Units

Technical Paper Publication: IMECE2023-116592
Aaron Freedkin - Northern Illinois University
Ji-Chul Ryu - Northern Illinois University
Jaejin Hwang - Northern Illinois University
**TECHNICAL SESSIONS**

**10:36AM**
Statistical Shape Modelling of the Lumbar Spine With Reference to Gender and Principal Component Analysis

Technical Paper Publication: IMECE2023-110141
Faris A. Almalki - Penn State University
Daniel H. Cortes - Penn State University

**10:57AM**
Comparison of Biodiesel/Glycerin Separation by Gravitational Settling and Electrostatic Coagulation

Technical Paper Publication: IMECE2023-113976
Saanyol Ityokumbul Igba - Tennessee Technological University
Daniel Swartling - Tennessee Technological University
Elsawy Ahmed - Tennessee Technological University
Stephen Idem - Tennessee Technological University

**11:18AM**
The Effectiveness of Osteogenic Progenitor and Osteocyte-Like Cell Seeding, Attachment, Proliferation, and Integration Into Biologically Compatible 3D Printed Bone Scaffolds

Technical Presentation: IMECE2023-119944
Sheikh Ferdous - Penn State Harrisburg
Md Ashiqur Rahman - The University of Texas Rio Grande Valley
Md. Abdur Rahman Bin Abdus Salam - The University of Texas Rio Grande Valley
Ali Ashraf - The University of Texas Rio Grande Valley
Kristopher Schwab - Indiana State University

**11:39AM**
Pitcherview: Using Computational Biomechanics to Optimize the Baseball Pitching Motion

Technical Presentation: IMECE2023-112592
James O’Flanagan - O’Flanagan All-Purpose Services LLC

**06-05-03: BIOMEDICAL DEVICES**
**11/2/2023**
**2:00PM–3:45PM – ROOM 270**

**2:00PM**
Development and Calibration of Rectal Tonometer for Neurological Studies

Technical Paper Publication: IMECE2023-112732
Miguel Osorio - University of Arizona
Eniko Enikov - University of Arizona

**2:21PM**
A Novel Device for the Standardized Intraoperative Preparation of Non-Valved Glaucoma Tube Shunts

Technical Paper Publication: IMECE2023-113067
Faleh Alzoubi - The Ohio State University
Jack Laird - The Ohio State University
Caleb Mallory - The Ohio State University
Mallory Stewart - The Ohio State University
Natalie Zachariah - The Ohio State University
Lauren Eichaker - The Ohio State University
Joshua Evans - The Ohio State University

**2:42PM**
Development of Paper-Based RNA Amplification Devices for Point-of-Care Detection of HIV

Technical Paper Publication: IMECE2023-113172
George Adedokun - University of Florida
Gurjit Sidhu - University of Florida
Gary P. Wang - University of Florida
Z. Hugh Fan - University of Florida
3:03PM
Towards Development of Novel Remote Ultrasound Robotic System Using Soft Robotics Technology

Technical Paper Publication: IMECE2023-113641
Sky Papendorp - Kennesaw State University
Ammy Ovando - Kennesaw State University
Saleh Gharai - Deakin University
Bobak Mosadegh - Cornell University
David Guerra-Zubiaga - Kennesaw State University
Seyedhamidreza Aloie - New Mexico State University
Turaj Ashuri - Kennesaw State University
Amir Ali Amiri Moghadam - Kennesaw State University

2:21PM
A 3-D Virtual Human Model to Predict Responses to Thermal Stress

Technical Presentation: IMECE2023-119707
Jose Enrique Rubio - United States Army Medical Research and Development Command
Tushar Gulati - United States Army Medical Research and Development Command
Rajeev Hatwar - United States Army Medical Research and Development Command
Ginu Unnikrishnan - United States Army Medical Research and Development Command
Jaques Reifman - United States Army Medical Research and Development Command

06-08-01: BIOTRANSPORT (FLUID, HEAT, AND MASS)
11/2/2023
2:00PM–3:45PM – ROOM 271

2:00PM
Inflow Conditions and the Mass Transfer Behavior of a Non-Newtonian Biofluid in Separated Flows

Technical Paper Publication: IMECE2023-112151
Khaled J. Hammad - Central Connecticut State University

2:42PM
Biohybrid Living Pumping Machines Powered by Engineered Muscle Tissues

Technical Presentation: IMECE2023-119815
Zhengwei Li - University of Houston

3:03PM
Design and Fabrication of Human Head and Neck Model for Concussion and TBI Experiment

Technical Paper Publication: IMECE2023-113064
Peyman Honarmandi - Manhattan College
Caitlin Reina - The City College of New York
George Capiccioni - The City College of New York
3:24PM
Effects of Knee Hyperextension on Transtibial Amputate Gait

Technical Paper Publication: IMECE2023-113743
Daniel Moreno-Agudelo - Universidad EAFIT
Yessika Ortega-Bedoya - Universidad EAFIT
Fanny Valencia-Legarda - Fundacion Universitaria
Maria Cano
Elizabeth Rendon-Velez - Universidad EAFIT

06-09-02: COMPUTATIONAL MODELING IN BIOMEDICAL APPLICATIONS - II
11/2/2023
2:00PM–3:45PM – ROOM 272

2:00 PM
Developing a Computational Model of Lungs for Patients With Acute Respiratory Distress Syndrome (ARDS)

Technical Paper Publication: IMECE2023-117254
Chinmay Chavan - Texas A&M University
Asma Zainab - Houston Methodist Hospital & Research Institute; Weill Cornell Medical College
Debjyoti Banerjee - Texas A&M University

2:21PM
Vascular Model of Liver Fibrosis
Technical Paper Publication: IMECE2023-112123
Aimee M. Torres Rojas - Villanova University
Sylvie Lorente - Villanova University

2:42PM
Optimization of the Flow Parameters for a Liver Organ-on-a-Chip Computational Model

Technical Paper Publication: IMECE2023-113639
Edgar Pinto - University of Minho
Violeta Carvalho - University of Minho
Nelson Rodrigues - University of Minho
Raquel O. Rodrigues - University of Minho
Rui A. Lima - University of Minho
Senhorinha Teixeira - University of Minho

3:03PM
Numerical Studies of Hemodynamic Flow in the Aortic Vessel of Patients With Congenital Heart Disease

Technical Paper Publication: IMECE2023-111933
Justin Jack - University of Arkansas
Morten Jensen - University of Arkansas
Thomas Collins - University of Kentucky
Frandics Chan - Stanford University
Paul Millett - University of Arkansas
TECHNICAL SESSIONS

06-05-04: BIOMEDICAL DEVICES
11/2/2023
4:00PM–5:45PM – ROOM 270

4:00PM
Cost-Effective Method Using Force Sensors for Chiropractic Teaching

Technical Paper Publication: IMECE2023-113973
Iti Shah - Kennesaw State University
Carolyn Butler - Kennesaw State University
Muhammad Salman - Kennesaw State University

4:21PM
The Role of Meditation in Stress Recovery and Performance: An EEG Study

Technical Paper Publication: IMECE2023-114023
Mohammad Ahmed - Florida Institute of Technology
Mehmet Kaya - Florida Institute of Technology
Amirtaha Taebi - Mississippi State University
Peshala Thibbotuwawa Gamage - Florida Institute of Technology

4:42PM
A Point-of-Care Device Integrating Sample Preparation With Isothermal Amplification for Detection of Mayaro Virus

Technical Paper Publication: IMECE2023-114292
Morteza Alipanah - University of Florida
John A. Lednicky - University of Florida
J. Glenn Morris - University of Florida
Z. Hugh Fan - University of Florida

5:03PM
Mosquito-Inspired Cannula to Improve Control of Active Surgical Needle in Soft Tissue

Technical Paper Publication: IMECE2023-113978
Sharad Raj Acharya - Temple University
Doyoung Kim - Temple University
Parsaoran Hutapea - Temple University

06-11-01: SENSORS AND ACTUATORS
11/2/2023
4:00PM–5:45PM – ROOM 271

4:00PM
The Effect of the Shape of In-Plane Nanopores on Resistive Pulse Sensing Signals of Nucleotides in Polymer Dual In-Plane Nanopores Sensors

Technical Presentation: IMECE2023-114611
Hooman Abdolvand - Louisiana State University
Ramin Riahipour - Louisiana State University
Junseo Choi - Louisiana State University
Steven A Soper - The University of Kansas
Sunggook Park - Louisiana State University

4:21PM
The Effect of Electrolyte Type on the Translocation of DNA Nucleobases Using a Dual In-Plane Nanopore Sensor

Technical Presentation: IMECE2023-113391
Ramin Riahipour - Louisiana State University
Junseo Choi - Louisiana State University
Steven Soper - University of Kansas
Sunggook Park - Louisiana State University
4:42PM
Feedback Guided Self Training Balance Equipment for Physical Therapy and Elite Athlete Use

Technical Paper Publication: IMECE2023-112832
Akin Tatoglu - University of Hartford
Katherine Wilson - University of Hartford
Alexandra Chabot - University of Hartford
Jarel Marcelin - University of Hartford
Claudio Campana - University of Hartford
Mary Cater Arico - University of Hartford

5:03PM
Physiological Sensing in HALO/HAHO Environment

Technical Paper Publication: IMECE2023-114252
Audra Bloch - United States Military Academy
Nolan Kersten - United States Military Academy
Eli Short - United States Military Academy
Parker Stevens - United States Military Academy
Benjamin Simonson - United States Military Academy
Brodie Hoyer - United States Military Academy

4:00PM – 5:45PM – Room 272

4:00PM
Simulation and Experimental Validation of a Microfluidic Device

Technical Paper Publication: IMECE2023-111787
Violeta Carvalho - University of Minho
Inês Gonçalves - University of Minho
Nelson Rodrigues - University of Minho
Paulo Sousa - University of Minho
Vânia Pinto - University of Minho
Graça Minas - University of Minho
Raquel O. Rodrigues - University of Minho
Senhorinha Teixeira - University of Minho
Rui A. Lima - University of Minho

4:21PM
Modeling of Human Femoral Bone Idealized As Functionally Graded and Laminated Composite Structure

Technical Paper Publication: IMECE2023-112920
Mobashar Kabir - Sultan Qaboos University
Tasneem Pervez - Sultan Qaboos University
Farooq K.S. Al-Jahwari - Sultan Qaboos University
Sayyad Z. Qamar - Sultan Qaboos University

4:42PM
Predicting Needle Deflection in Soft Tissue: A Computational Modeling Approach

Technical Paper Publication: IMECE2023-113833
Samer Al-Safadi - Temple University
Parsaoran Hutapea - Temple University
TECHNICAL SESSIONS

5:03PM
Spike Analysis of the Neural Activities Across the Rats’ Auditory Brain Structure

Technical Paper Publication: IMECE2023-112974
Alexis Meeker - University of Michigan-Flint
Jensen Van Gampelaere - University of Michigan-Flint
Linda Zhu - University of Michigan-Flint
Hao Luo - Henry Ford Health System
Jinsheng Zhang - Wayne State University

5:24PM
A Finite Element Model for Analyzing the Shear Wave Propagation in Soft Biomaterials

Technical Paper Publication: IMECE2023-114066
Jianing Wang - Florida Institute of Technology
Runze Li - University of Southern California
Qifa Zhou - University of Southern California
Linxia Gu - Florida Institute of Technology
Pengfei Dong - Florida Institute of Technology

Track 7: Dynamics, Vibration, and Control

Topics:
7-1: General Dynamics, Vibration, and Control
7-2: Nonlinear Dynamics, Control, and Stochastic Mechanics
7-3: Design and Control of Robots, Mechanisms, and Structures
7-4: Fluid-Structure Interaction
7-5: Dynamics and Control in Micro/Nano Engineering
7-6: Smart Structures and Structronic Systems: Sensing, Energy Generation, and Control
7-7: Novel Control of Dynamic System and Design
7-8: Multibody Dynamic Systems and Applications
7-9: Vibrations of Continuous Systems
7-10: Mobile Robots and Unmanned Ground Vehicles
7-11: Control Theory and Applications
7-12: Optimization, Uncertainty, and Probability
7-13: Multi-Physics Dynamics-Control & Diagnostics-Prognostics of Structures and Devices
7-14: Renewable Energy, Structural Health Monitoring, and Distributed Structural Systems
7-15: Dynamics and Control of Soft Structures
7-16: Multi-Field Coupling and Control
7-17: Machine Learning and Artificial Intelligence in Dynamics and Vibrations
7-18: Marine Electromechanical Systems and Ocean Mechatronics
7-19: Symposium to Building on the 100th Anniversary of the Timoshenko-Ehrenfest Beam Model
7-20: Congress-Wide Symposium on NDE & SHM: Dynamics, Vibration, and Control for Structural Health Monitoring Applications
7-21: Modelling and Design Advances of Rotating Structures
ACKNOWLEDGMENT

TRACK ORGANIZERS

Track Organizer: Eleonora Tubaldi, University of Maryland
Track Co-Organizer: Kostas Karazis, Framatome Inc.
Track Co-Organizer: Francesco Pellicano, Università degli Studi di Modena e Reggio Emilia

TOPIC ORGANIZERS:

Akin Tatoglu, University of Hartford
Alba Sofi, University “Mediterranea” of Reggio Calabria
Ameneh (Neda) Maghsoodi, University of Southern California
Amin Ghadami, University of Southern California
Amir Ali Moghadam, Kennesaw State University
Bogdan Epureanu, University of Michigan
Brian Painter, AREVA Inc.
Dan Wang, Nanjing University of Aeronautics and Astronautics
Den Segalman
Dumitru Caruntu, The University of Texas-Rio Grande Valley
Eleonora Tubaldi, University of Maryland
Francesco Pellicano, Università di Modena e Reggio Emilia
Francesco Romeo
Giulio Reina, Politecnico di Bari
Giuseppe Muscolino, University of Messina
Giuseppe Quaglia, Politecnico di Torino
Hong Zhou, Texas A&M University–Kingsville
Hornsen Tzou, Nanjing University of Aeronautics and Astronautics
Hua Li
Ioannis Georgiou, National Technical University of Athens
Isaac Elishakoff, Florida Atlantic University
Kostas Karazis, Framatome Inc.
Luca Bruzzone
Luca Caracoglia, Northeastern University
Majura Seleka, North Dakota State University
Marco Amabili, McGill University
Mohammad Harb
Mu Fan, Nanjing University of Aeronautics and Astronautics
Nikolaos I. Xiros, The University of New Orleans
Pezhman Hassanpour, California State Polytechnic University, Pomona
Pol Spanos
Puren Ouyang, Ryerson University
Rafael Ruiz, University of Michigan-Dearborn
Renato Vidoni, Free University of Bolzano
Shawn Duan, Saint Martin’s University
Sichen Yuan
Soheil Anwar, Indiana University–Purdue University Indianapolis
Steve Suh, Texas A&M University
Weidong Zhu, University of Maryland, Baltimore County
William Prescott, Siemens Product Life Cycle Management
Yanfeng Shen, Shanghai Jiao Tong University
Yu Guo, Midwestern State University
Zhibin Lin
Zhiyuan Yu, Miami University

SESSION CHAIRS:

Akin Tatoglu, University of Hartford
Alba Sofi, University “Mediterranea” of Reggio Calabria
Amin Ghadami, University of Southern California
Ayse Tekes, Kennesaw State University
Bogdan Epureanu, University of Michigan
Brian Painter, AREVA Inc.
Cody Chan, National Taipei University of Technology
Dumitru Caruntu, The University of Texas-Rio Grande Valley
Eleonora Tubaldi, University of Maryland
Francesco Pellicano, Università di Modena e Reggio Emilia
Giovanni Carabin, Free University of Bozen-Bolzano
TECHNICAL SESSIONS

Giulio Reina, Politecnico di Bari
Giuseppe Muscolino, University of Messina
Giuseppe Quaglia, Politecnico di Torino
Hong Zhou, Texas A&M University–Kingsville
Hornsen Tzou, Nanjing University of Aeronautics and Astronautics
Hua Li
Ioannis Georgiou, National Technical University of Athens
Isaac Elishakoff, Florida Atlantic University
Jiaze He, The University of Alabama
Kiwon Sohn, University of Hartford
Kostas Karazis, Framatome Inc.
Luca Bruzzone
Luca Caracoglia, Northeastern University
Majura Seleka, North Dakota State University
Marco Amabili, McGill University
Mohammad Harb
Nikolaos I. Xiros, The University of New Orleans
Pezhman Hassanpour, California State Polytechnic University, Pomona
Pol Spanos
Puren Ouyang, Ryerson University
Rafael Ruiz, University of Michigan-Dearborn
Renato Vidoni, Free University of Bolzano
Sebastian Roa Prada, Universidad Autónoma De Bucaramanga
Shathushan Sivashangaran, Virginia Tech
Shawn Duan, Saint Martin’s University
Sohel Anwar, Indiana University–Purdue University Indianapolis
William Prescott, Siemens Product Life Cycle Management
Yanfeng Shen, Shanghai Jiao Tong University
Zhiyuan Yu, Miami University

TRACK 7: DYNAMICS, VIBRATION, AND CONTROL
MONDAY, OCTOBER 30

07-01-01: GENERAL DYNAMICS, VIBRATION, AND CONTROL
10/30/2023
10:45AM–12:30PM – ROOM 264

10:45AM
Model of a Fluid-Level System for the Design and Analysis of Detention Basins Considering Recent Weather Extreme Events and Historic Precipitation Data

Technical Paper Publication: IMECE2023-116564
Pezhman Hassanpour - California State Polytechnic University, Pomona

11:06AM
Mounting Systems for Electric Powertrains: Optimization and Parameter Sensitivity

Technical Paper Publication: IMECE2023-109681
Sudhir Kaul - Western Carolina University
Chaitanya Borra - Western Carolina University

11:27AM
An ANOVA Based Study of Variations in Circularity Form Error Due to Mathematical Methods and Measuring Instrument Eccentricity

Technical Paper Publication: IMECE2023-109700
Chittaranjan Sahay - University of Hartford
Suhash Ghosh - University of Hartford
Nithish Adhithya Venkatesh - University of Hartford
11:48AM

Numerical and Experimental Investigation for Recoil Dynamics of Machine Gun Used in Small Size - Unmanned Aerial Vehicle

Technical Paper Publication: IMECE2023-110303
Hasan Tolga Gümüsel - REPKON Machine and Tool Industry and Trade Inc.
Bülent Acar - REPKON Machine and Tool Industry and Trade Inc.
Ali Yetgin - REPKON Machine and Tool Industry and Trade Inc.

07-02-01: NONLINEAR DYNAMICS, CONTROL, AND STOCHASTIC MECHANICS
10/30/2023
10:45AM–12:30PM – ROOM 265

10:45AM

Reduced Order Model of Parametric Resonance of Electrostatically Actuated Cantilever Resonators: Comparison Uniform Versus Non-Uniform Resonators

Technical Paper Publication: IMECE2023-113248
Dumitru Caruntu - The University of Texas Rio Grande Valley
Rigoberto Flores The - University of Texas Rio Grande Valley

11:06AM

Predictive Control of the Kinova Gen3 Robotic Manipulator Using a Nonlinear Model

Technical Paper Publication: IMECE2023-112777
Amanuel Tereda - North Carolina A&T State University
Sun Yi - North Carolina A&T State University

11:27AM

Dynamic Prediction of Waveform Sequences in a Heartbeating Model

Technical Paper Publication IMECE2023-113119
Xinya Wang – Xi’an Jiaotong University
Yeyin Xu – Xi’an Jiaotong University
Tieyan Wang - BaiCheng Meteorological Observatory
Yinghou Jiao - Harbin Institute of Technology
Zhaobo Chen - Harbin Institute of Technology

11:48AM

Nonlinear Dynamics Simulation of R-RTR Planar Mechanism

Technical Paper Publication: IMECE2023-113209
Louay S. Yousuf - San Diego State University

12:09PM

Why Do Humans Twist Their Ankle: A Nonlinear Dynamical Stability Model for Lower Limb

Technical Presentation: IMECE2023-119019
Yue Guan - University of Memphis
07-03-01: Design and Control of Robots, Mechanisms
And Structures I
10/30/2023
10:45AM–12:30PM – Room 290

10:45AM
Modular Tactile End Effector Design for Enhancing Haptic Feedback in Teleoperated Robotic Systems

Technical Paper Publication: IMECE2023-113969
Jenny Huynh - San Jose State University
Hanxuyen Duong - San Jose State University
Gaojian Huang - San Jose State University
Egbe-Etu Etu - San Jose State University
David Quintero - San Francisco State University
Lin Jiang - San Jose State University

11:06AM
Brake System Dynamics and Control for an Autonomous Personal Rapid Transit Vehicle

Technical Paper Publication: IMECE2023-113720
Nikhil Patil - North Carolina State University
Dustin Best - North Carolina State University
Seth Hollar - North Carolina State University

11:27AM
Model-Free Improvement of Contouring Accuracy of Nonsymmetric Planar 3PRR Parallel Kinematics Machine

Technical Paper Publication: IMECE2023-113191
Abdur Rosyid - Khalifa University of Science and Technology
Bashar El-Khasawneh - Khalifa University of Science and Technology

11:48AM
Prediction of Insect Locomotion to Control the Transparent Omnidirectional Locomotion Compensator (TOLC)

Technical Paper Publication: IMECE2023-112618
Kaushik Rahman - Kennesaw State University
Daniel Ehme - Kennesaw State University
Matthew Ackerman - Kennesaw State University
Clint Penick - Kennesaw State University
Dal Hyung Kim - Kennesaw State University

12:09PM
Solar Trackers Using Spherical Mechanisms

Technical Paper Publication: IMECE2023-113087
Aditya Krishna Sivarapu - Texas A&M University-Kingsville
Hong Zhou - Texas A&M University-Kingsville

07-06-01: Smart Structures and Structronic Systems: Sensing, Energy Generation and Control
10/30/2023
10:45AM–12:30PM – Room 266

10:45AM
Multiphysics Through-Metal Ultrasonic Data Transmission Bridging Electromagnetic and Piezoelectric Methods

Technical Presentation: IMECE2023-119728
Kevin Dix - Georgia Institute of Technology
Alper Erturk - Georgia Institute of Technology
Ihab El-Kady - Sandia National Laboratories
TECHNICAL SESSIONS

11:06AM
Dry-Contact Multi-Stage Ultrasonic Power Transfer System and Selection of Gasket Material
Technical Presentation: IMECE2023-120163
Allen Zhou - Georgia Institute of Technology
Kevin Dix - Georgia Institute of Technology
Prabhakaran Manogharan - Georgia Institute of Technology
Alper Erturk - Georgia Institute of Technology
Ihab El-Kady - Sandia National Laboratories

11:27AM
Influence of Beam Geometry on the Power Capacity of a Cantilever Beam Based Energy Harvester
Technical Paper Publication: IMECE2023-112154
Md. Mohiuddin - Khulna University of Engineering & Technology
Zahir U. Ahmed - Khulna University of Engineering & Technology
Riaz Ahmed - University of Wisconsin-Green Bay

11:48AM
Experimental Research on Photo-Induced PLZT-Based Electrostatic Micro Gripper
Technical Paper Publication: IMECE2023-112219
Zhen Lv - Nanjing University of Science and Technology
Zhicheng Liu - Nanjing University of Science and Technology
Yujuan Tang - Jinling Institute of Technology
Xinjie Wang - Nanjing University of Science and Technology

12:09PM
Energy Harvesting by Vortex-Induced Vibrations of Structures With Different Cross-Sections
Technical Paper Publication: IMECE2023-112805
Ussama Ali - Khalifa University of Science and Technology
Md. Islam - Khalifa University of Science and Technology
Isam Janajreh - Khalifa University of Science and Technology

07-01-02: GENERAL DYNAMICS, VIBRATION, AND CONTROL
10/30/2023
2:00PM–3:45PM – ROOM 264

2:00PM
Experimental Determination of Electromechanical Coupling Matrices for Active Vibration Control of Composite Structures
Technical Paper Publication: IMECE2023-112610
Celia Hameury - McGill University
Giovanni Ferrari - McGill University
Prabakaran Balasubramanian - Technology Innovation Institute
Tarcisio M.P. Silva - Technology Innovation Institute
Marco Amabili - McGill University
Abdulaziz Buabdulla - Technology Innovation Institute
Giulio Franchini - Technology Innovation Institute

2:21PM
Modeling and Analysis of Terrestrial Locomotion Dynamics of Helical Drive-Propelled Multi-Terrain Vehicles
Technical Paper Publication: IMECE2023-111018
Sumedh Beknalkar - North Carolina State University
Aditya Varanwal - North Carolina State University
Ryan Lynch - North Carolina State University
Matthew Bryant - North Carolina State University
Andre Mazzoleni - North Carolina State University
2:42PM

A Hybrid Time-Varying Integrator-Gain Control Strategy for an Ultra-Precision Wafer Stage

Technical Paper Publication: IMECE2023-111839
Tao Liu - Beijing Key Laboratory of Precision/Ultra-precision Manufacturing Equipments and Control
Kaiming Yang - Beijing Key Laboratory of Precision/Ultra-precision Manufacturing Equipments and Control
Yu Zhu - Beijing Key Laboratory of Precision/Ultra-precision Manufacturing Equipments and Control

3:03PM

Vibration Phenomenon of Infants by Using a Baby Carriers

Technical Paper Publication: IMECE2023-112252
Ryogo Iguchi - Okayama Prefectural University
Shinichiro Ota - Okayama Prefectural University
Katsuhiro Asano - Okayama Prefectural University

3:24PM

Deep Neural Network-Based Prediction of Time-Varying Vibration Characteristics for Vibration Suppression in Robot Arms

Technical Presentation: IMECE2023-118658
Yunhe Bai - Zhejiang Lab
Yanyan Zhang - Zhejiang Lab
Minhong Wan - Zhejiang Lab
Jianjun Gu - Zhejiang Lab
Tiefeng Li - Zhejiang University
3:24PM

Application of Modal Superposition Method With Response Dependent Nonlinear Modes on the Forced Response Analysis of Bolted Joint Connections

Technical Paper Publication: IMECE2023-113678
Humeyra Beyan - Middle East Technical University
Ender Cigeroglu - Middle East Technical University

07-08-01: MULTIBODY DYNAMIC SYSTEMS AND APPLICATIONS
10/30/2023
2:00PM–3:45PM – ROOM 266

2:00PM

Design, Development, Analysis, and Preliminary Testing of a Compliant Knee for Bipedal Robots

Technical Paper Publication: IMECE2023-113153
Connor Talley - Kennesaw State University
Anthony Tetrault - Kennesaw State University
Parker Woods - Kennesaw State University
Majazz Allah - Kennesaw State University
Nathan Jones - Kennesaw State University
Catherine Wilson - Kennesaw State University
Coskun Tekes - Kennesaw State University
Ayse Tekes - Kennesaw State University

2:11PM

ADAMS Multibody Simulation of Jamming in the Recirculation Channel of a Single-Nut Ball Screw

Technical Paper Publication: IMECE2023-111583
Antonio Carlo Bertolino - Politecnico di Torino
Andrea De Martin - Politecnico di Torino
Roberto Guida - Politecnico di Torino
Massimo Sorli - Politecnico di Torino

2:42PM

Design and Development of Remote Operated and Soft Biomimetic Amphibious Mud Skipper

Technical Paper Publication: IMECE2023-113173
Rafael Juarez - Kennesaw State University
Sungchan Cho - Kennesaw State University
Kevin Tran - Kennesaw State University
Ullyses Luperco - Kennesaw State University
Lucas Schwenck - Kennesaw State University
Connor Talley - Kennesaw State University
Ayse Tekes - Kennesaw State University

3:03PM

Dynamic Modelling and Experimental Validation of Reaction Forces in Crane Structures

Technical Paper Publication: IMECE2023-113245
Thorstein Rykkje - Western Norway University of Applied Sciences
Alexander Bakketun Ringheim - Western Norway University of Applied Sciences
Jonathan Lundgaard - Western Norway University of Applied Sciences
Kenan Mezher - Western Norway University of Applied Sciences
Knut Øvsthus - Western Norway University of Applied Sciences
Thomas Impelluso - Western Norway University of Applied Sciences
TECHNICAL SESSIONS

3:24PM
Analysis and Modeling of the Laser Bore Joint to Prevent Alignment Failures
Technical Paper Publication: IMECE2023-113435
Mario Troise - Politecnico di Torino
Davide Sorli - Politecnico di Torino
Matteo Gaidano - Politecnico di Torino
Matteo Melchiorre - Politecnico di Torino
Pierpaolo Palmieri - Politecnico di Torino
Stefano Mauro - Politecnico di Torino

2:42PM
Modeling Underwater Propulsion of a Helical Drive Using Computational Fluid Dynamics for an Amphibious Rover
Technical Paper Publication: IMECE2023-113954
Brigid Donohue - North Carolina State University
Sumedh Beknalkar - North Carolina State University
Riley Bishop - North Carolina State University
Matthew Bryant - North Carolina State University
Andre Mazzoleni - North Carolina State University

3:03PM
Excavators Using Adjustable Linkages
Technical Paper Publication: IMECE2023-112677
Manoj Kumar Kotte - Texas A&M University–Kingsville
Hong Zhou - Texas A&M University–Kingsville

4:00PM
Design and Development of a Shaking Machine and Techniques to Characterize the Damage Generated by Mechanical Vibrations in Feather Art and Antique Manuscripts
Technical Paper Publication: IMECE2023-112665
Alí E. Armenta-Marquez - Universidad Nacional Autónoma de México
Diego A. Zamora-Garcia - Universidad Nacional Autónoma de México
Luis F. Arana-Lopez - Universidad Nacional Autónoma de México
Ma. Pilar Corona-Lira - Universidad Nacional Autónoma de México
Alejandro C. Ramirez-Reivich - Universidad Nacional Autónoma de México
4:21PM

Experimental Comparison of Model-Free Vibration Control Based on Virtual Controlled Object and Model-Based Control: Robustness to Characteristic Changes in Actual Controlled Object

Technical Paper Publication: IMECE2023-112871
Ansei Yonezawa - Hokkaido University
Heisei Yonezawa - Hokkaido University
Itsuro Kajiwara - Hokkaido University

4:42PM

Improved Six Rules-Based Fuzzy Compensation for Time-Varying Control Cycle in Active Powertrain Oscillation Reduction

Technical Paper Publication: IMECE2023-113274
Heisei Yonezawa - Hokkaido University
Ansei Yonezawa - Hokkaido University
Itsuro Kajiwara - Hokkaido University

5:03PM

Preliminary Dynamical Model of the LISA/LISA-Pathfinder Release Mechanism

Technical Paper Publication: IMECE2023-113470
Matteo Tomasi - University of Trento
Carlo Zanoni - Italian National Institute for Nuclear Physics
Davide Vignotto - University of Trento
Daniele Bortoluzzi - University of Trento
Edoardo Dalla Ricca - University of Trento
5:24PM

NVH Behaviour of Disc Brake Systems on High-Speed Trains
Technical Presentation: IMECE2023-119118
Andreas Krumm - Technische Universität Braunschweig
Georg-Peter Ostermeyer - Technische Universität Braunschweig
Frank Schiefer - Technische Universität Braunschweig
Carsten Schilde - Technische Universität Braunschweig

4:42PM

Comparison of Control Strategies for Temperature Control of Buildings
Technical Paper Publication: IMECE2023-113573
Gabriela Gabriela Salcan-Reyes - Escuela Superior Politecnica del Litoral
Ricardo Cajo - Escuela Superior Politecnica del Litoral
Adriana Aguirre - Escuela Superior Politecnica del Litoral
Víctor Espinoza - Escuela Superior Politecnica del Litoral
Douglas Plaza - Escuela Superior Politecnica del Litoral
Cesar Martin - Escuela Superior Politecnica del Litoral

07-02-03: NONLINEAR DYNAMICS, CONTROL, AND STOCHASTIC MECHANICS
10/30/2023
4:00PM–5:45PM – ROOM 265

4:00PM

Dynamic Simulations of a Cam Planar Mechanism With Impacts and Clearance
Technical Paper Publication: IMECE2023-113227
Louay S. Yousuf - San Diego State University
Dan Marghitu - Auburn University

5:03PM

Comparison of Control Strategies for Temperature Control of Buildings
Technical Paper Publication: IMECE2023-113573
Gabriela Gabriela Salcan-Reyes - Escuela Superior Politecnica del Litoral
Ricardo Cajo - Escuela Superior Politecnica del Litoral
Adriana Aguirre - Escuela Superior Politecnica del Litoral
Víctor Espinoza - Escuela Superior Politecnica del Litoral
Douglas Plaza - Escuela Superior Politecnica del Litoral
Cesar Martin - Escuela Superior Politecnica del Litoral

4:21PM

Effect of Wear on the Forced Response of a Shrouded Blade
Technical Paper Publication: IMECE2023-113665
Aykut Cardak - Middle East Technical University
Ender Cigeroglu - Middle East Technical University

5:24PM

Wavelet Based Nonlinear Time-Frequency Control Theory With Local Adaptability
Technical Paper Publication: IMECE2023-115011
Chi-Wei Kuo - AI Biosciences, Inc.
C. Steve Suh - Texas A&M University
### TECHNICAL SESSIONS

#### 07-09-01: VIBRATIONS OF CONTINUOUS SYSTEMS
**10/30/2023**
**4:00PM–5:45PM – ROOM 266**

**4:00PM**

**An Improved Technique for the Experimental Characterization of Small Impulses: A Space Technology Case of Study**

Technical Presentation: IMECE2023-119807

Edoardo Dalla Ricca - University of Trento

Giuliano Agostini - University of Trento

Daniele Bortoluzzi - University of Trento

Carlo Zanoni - Trento Institute for Fundamental Physics and Applications

Dario Petri - University of Trento

---

**5:03PM**

**Modeling and Simulation of Orbit Rising Stem Ball Valve System for Real-Time Health Monitoring and Condition-Based Maintenance**

Technical Paper Publication: IMECE2023-111695

Yaou Wang - SLB

Taoufik Wassar - SLB

Shu Pan - SLB

Jibin Shi - SLB

Haitao Zhang - SLB

Ke Li - SLB

---

**5:24PM**

**Model-Based Visual Control for Robotic Manipulators Using Udwadia Kalaba Formulation**

Technical Paper Publication: IMECE2023-112976

Edward Morgan - Louisiana State University

William Ard - Louisiana State University

Corina Barbalata - Louisiana State University

---

#### 07-03-03: DESIGN AND CONTROL OF ROBOTS, MECHANISMS, AND STRUCTURES III
**10/30/2023**
**4:00PM–5:45PM – ROOM 290**

**4:00PM**

**Computational Verification of Analytical Modal Analysis Solution of Non-Symmetric 3RPR Parallel Kinematics Manipulator**

Technical Paper Publication: IMECE2023-113212

Abdur Rosyid - Khalifa University of Science and Technology

Bashar Elkhasawneh - Khalifa University of Science and Technology

Anas Alazzam - Khalifa University of Science and Technology
4:21PM

An Iterative Actuation Method for Master-Slave Telemanipulation by Humanoid Robot Arm

Technical Paper Publication: IMECE2023-113863
Ethan Barlow - Weber State University
Tariq M. Arif - Weber State University
Parker Bentley - Weber State University
Hudson Hiatt - Weber State University
Chase Call - Weber State University

4:42PM

The Tremendous Increase of Clearance–Induced Uncertainty Near the Singularity Positions of Planar Parallel Manipulators

Technical Paper Publication: IMECE2023-111773
Cody Leeheng Chan - National Taipei University of Technology
Yu-Chieh Lai - National Yang Ming Chiao Tung University

5:03PM

Development of a Control System Architecture for a Self-Driving Humanoid, HART

Technical Paper Publication: IMECE2023-111598
Kiwon Sohn - University of Hartford
Jordaine Wisdom - University of Hartford
Ethan Sharpe - University of Hartford
James Robinson - University of Hartford
Rahul Kumar - University of Hartford
Akin Tatoglu - University of Hartford

10:15AM

A Dynamic Model for Underwater Propulsion of an Amphibious Rover Developed From Kane’s Method

Technical Paper Publication: IMECE2023-113559
Brigid Donohue - North Carolina State University
Sumedh Beknalkar - North Carolina State University
Matthew Bryant - North Carolina State University
Andre Mazzoleni - North Carolina State University

10:36AM

Predicting Oscillatory Patterns of Mud Circulating Along the Well-Bore in Drilling Procedures: A Finite Element Model

Technical Paper Publication: IMECE2023-113806
Eleazar Marquez - The University of Texas Rio Grande Valley

10:57AM

Design and Construction of a Terrestrial Testing Rig for Experimental Characterization of Multi-Terrain Screw-Propelled Vehicle Dynamics

Technical Paper Publication: IMECE2023-114019
Ryan Lynch - North Carolina State University
Sumedh Beknalkar - North Carolina State University
Riley Bishop - North Carolina State University
Arin Crow - North Carolina State University
Brigid Donohue - North Carolina State University
Cristian Pacheco-Cay - North Carolina State University
Alaina Smith - North Carolina State University
Andre Mazzoleni - North Carolina State University
Matthew Bryant - North Carolina State University
11:18AM
Design and Optimization of Tuned Mass Dampers to Improve Settling Time of a Precision Optical System
Technical Paper Publication: IMECE2023-114234
Stephen Sidletsky - San Jose State University
Feruza Amirkulova - San Jose State University
Michel Pharand - San Jose State University
Burford Furman - San Jose State University

11:39AM
Technical Paper Publication: IMECE2023-114316
Manish Edassery Sunny - National Institute of Technology Karnataka
Pruthviraj Umesh - National Institute of Technology Karnataka
K.V. Gangadharan - National Institute of Technology Karnataka
Devdas Shetty - University of the District of Columbia

10:15AM
Controlling Populations of Neural Oscillators
Technical Presentation: IMECE2023-110585
Jeff Moehlis - University of California, Santa Barbara

10:36AM
Introduction on Vibration Reproduction of Non-Strengthen Member by Real-Time Hybrid Testing
Technical Paper Publication: IMECE2023-112342
Masataka Kawaguchi - Doshisha University
Kenshiro Shimada - Doshisha University
Yugo Takeuchi - Doshisha University
Kazuto Tanaka - Doshisha University
Kimitaka Watanabe - Doshisha University

10:57AM
RISE-Like Saturated Control for Non-Smooth and Switched Non-Linear Systems
Technical Paper Publication: IMECE2023-112437
Sujata Basyal - Auburn University
Jonathan Ting - Auburn University
Brendon Allen - Auburn University
11:18AM

Local Pursuit Strategy-Inspired Cooperative Formation Flight and Collision Avoidance for UAV Cluster

Technical Paper Publication: IMECE2023-113399
Yi Wang - Northwestern Polytechnical University
Ni Li - Northwestern Polytechnical University
Ban Wang - Northwestern Polytechnical University
Xuemin He - Northwestern Polytechnical University
Yongning Zhu - Northwestern Polytechnical University
Ming Zhou - Xi’an ASN Technology Group Co. Ltd.

10:57AM

Modeling of Automotive Radar Sensor in Unreal Engine for Autonomous Vehicle Simulation

Technical Paper Publication: IMECE2023-112964
Adibuzzaman Rahi - Indiana University–Purdue University Indianapolis
Chris Orlin Cardoza - Advanced Science and Automation Corp.
Sri Sai Teja Vemupalli - Indiana University–Purdue University Indianapolis
Tamer Wasfy - Advanced Science and Automation Corp.
Sohel Anwar - Indiana University–Purdue University Indianapolis

07-10-01: MOBILE ROBOTS AND UNMANNED GROUND VEHICLES
10/31/2023
10:15AM–12:00PM – ROOM 269

10:15AM

Stuck in the Mud: Simulating the Effects of Deformation on Locomotive Efficiency

Technical Presentation: IMECE2023-112662
Josh VanCura - Texas A&M University
Justin Wilkerson - Texas A&M University

10:36AM

XTENTH-CAR: A Proportionally Scaled Experimental Vehicle Platform for Connected Autonomy and All-Terrain Research

Technical Paper Publication: IMECE2023-110448
Shathushan Sivashangaran - Virginia Tech
Azim Eskandarian - Virginia Tech

11:18AM

IR Sensor Modeling in Unreal Engine for Autonomous Vehicle Applications

Technical Paper Publication: IMECE2023-113001
Sri Sai Teja Vemupalli - Indiana University–Purdue University Indianapolis
Adibuzzaman Rahi - Indiana University–Purdue University Indianapolis
Spencer Mullins - Indiana University–Purdue University Indianapolis
Hatem Wasfy - Advanced Science and Automation Corp.
Sohel Anwar - Indiana University–Purdue University Indianapolis
Developing a Modular Control Moment Gyroscope for Planetary Rover Mobility
Technical Paper Publication: IMECE2023-113915
Fang Han - Worcester Polytechnic Institute
Jeremy Wiles - Worcester Polytechnic Institute
Aidan Brawley - Worcester Polytechnic Institute
Oliver Sanderson - Worcester Polytechnic Institute
Stephen Burke - Worcester Polytechnic Institute
Pradeep Radhakrishnan - Worcester Polytechnic Institute

Opportunities and Challenges in Biomimetic Robotic Simulation for In Vitro Testing of Chewable Drugs
Technical Paper Publication: IMECE2023-112227
Bangxiang Chen - The University of Auckland
Jaspreet S. Dhupia - The University of Auckland
Marco P. Morgenstern - New Zealand Institute for Plant and Food Research Ltd.
Feng Zhang - The University of Texas at Austin
Weiliang Xu - The University of Auckland

Evaluation of Power-Assisted Wheelchair to Reduce Burden on Elderly Caregivers
Technical Paper Publication: IMECE2023-112498
Katsuhiro Asano - Okayama Prefectural University
Shinichiro Ota - Okayama Prefectural University
Jinro Takato - Okayama Prefectural University

Technical Paper Publication: IMECE2023-112440
Meenakshi Narayan - Miami University
Zhiyuan Yu - Miami University

Mechatronic System Design of a Ball Launcher Machine for Speed and Anticipation Training in Combat Sports
Technical Paper Publication: IMECE2023-112398
Sebastian Roa Prada - Universidad Autónoma de Bucaramanga
Duvan Smith Barreto Sosa - Universidad Autonoma de Bucaramanga

A Unified Process Damping Model in Cutting With Velocity and Ploughing Effects
Technical Paper Publication: IMECE2023-114620
Yan Ru Jiang - Huazhong University of Science and Technology
Xiaojian Zhang - Huazhong University of Science and Technology
2:21PM

Cyber-Protection of a Wheel Rotational Kinematics Sensor for Agile Mobility

Technical Paper Publication: IMECE2023-114977
Jesse Paldan - Worcester Polytechnic Institute
Vladimir Vantsevich - Worcester Polytechnic Institute
David Gorsich - U.S. Army Ground Vehicle Systems Center
Pradeep Vitta - Southern Company Services
Lee Moradi - Worcester Polytechnic Institute

2:42PM

Foil Gas Bearing Damping Measurements and Analysis With Varied Configurations

Technical Paper Publication: IMECE2023-116832
Jared Knechel - University of Hartford
Giri Agrawal - R&D Dynamics Corp.
Chittaranjan Sahay - University of Hartford
Suhash Ghosh - University of Hartford

3:03PM

Performance of Vibration Isolators Using Two-Layered Foldable Structure Made of Sheet Material

Technical Presentation: IMECE2023-119959
Yuto Sakamoto - Meiji University
Sachiko Ishida - Meiji University

3:24PM

Extended Absolute Vibration Suppression Controllers

Technical Presentation: IMECE2023-116650
Shahar Levin - Technion
Yoram Halevi - Shenkar

2:00PM

Dynamics of a Confined Cantilevered Pipe Concurrently Subjected to Internal and External Axial Flows: A Computational Study

Technical Paper Publication: IMECE2023-115154
Farhang Daneshmand - Penn State Scranton
Tahereh Liaghat - McGill University
Michael Paidoussis - McGill University

2:21PM

Parameter Analysis of Spherical Pulsation Damper Using ANSYS Fluid-Solid Interaction

Technical Paper Publication: IMECE2023-116319
Finnley Butler - Saint Martin’s University
Shawn Duan - Saint Martin’s University

2:42PM

Dynamics of Two Parallel Inverted Flags in Axial Flow

Technical Paper Publication: IMECE2023-112706
Shaoguang Wang - McGill University
Mathias Legrand - McGill University
Michael Paidoussis - McGill University

3:03PM

Vortex Spoilers Do Not Work to Suppress Pulsations Generated by Turning Flows Into a Side Branch Against a Deadleg

Technical Paper Publication: IMECE2023-111156
Kamal K. Botros - NOVA Chemicals
Eric Clavelle - NOVA Chemicals
Nic Chan - NOVA Chemicals
Hemanth Satish - TC Energy
### TECHNICAL SESSIONS

<table>
<thead>
<tr>
<th>Time</th>
<th>Session Title</th>
<th>Presenters</th>
</tr>
</thead>
<tbody>
<tr>
<td>3:24PM</td>
<td>Fluid-Structure Interactions of Flexible and Flexibly-Mounted Structures in the Wake of a Rotating Cylinder</td>
<td>Adrian Carleton - University of Massachusetts Amherst</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Yahya Modarres-Sadeghi - University of Massachusetts Amherst</td>
</tr>
<tr>
<td>2:42PM</td>
<td>Comparison Between Two Distinct Dynamic Modeling Techniques and Three Linear and One Nonlinear Controller for a Universal Omni-Wheeled Mobile Robot: Application Offline Reinforcement Learning Based Navigation</td>
<td>Nalaka Amarasiri - University of Louisiana at Lafayette</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Alan A. Barhorst - University of Louisiana at Lafayette</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Raju Gottumukkala - University of Louisiana at Lafayette</td>
</tr>
<tr>
<td>3:03PM</td>
<td>SWARM Applications Using Commercial Robots</td>
<td>Emmanuel Augustine - Northern Kentucky University</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Minchul Shin - Northern Kentucky University</td>
</tr>
<tr>
<td>3:24PM</td>
<td>Design, Prototyping, and Experiments Using Small-Scale Helical Drive Rover for Multi-Terrain Exploration</td>
<td>Ashwin Vadlamannati - North Carolina State University</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sumedh Beknalkar - North Carolina State University</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Dustin Best - North Carolina State University</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Matthew Bryant - North Carolina State University</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Andre Mazzoleni - North Carolina State University</td>
</tr>
</tbody>
</table>

**07-10-02: MOBILE ROBOTS AND UNMANNED GROUND VEHICLES**

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Session Title</th>
<th>Presenters</th>
</tr>
</thead>
<tbody>
<tr>
<td>10/31/2023</td>
<td>2:00PM–3:45PM – ROOM 269</td>
<td>A Comparison of Motion Planning Methods for Autonomous Ground Vehicle Exploration and Search</td>
<td>Apoorva Khairnar - Virginia Tech</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Shathushan Sivashangaran - Virginia Tech</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Azim Eskandarian - Virginia Tech</td>
</tr>
<tr>
<td>2:21PM</td>
<td></td>
<td>A Decentralized Multi-Agent Path Planning Approach Based on Imitation Learning and Global Static Feature Extraction</td>
<td>Bohan Feng - Shanghai Jiao Tong University</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Youyi Bi - Shanghai Jiao Tong University</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Mian Li - Shanghai Jiao Tong University</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Liyong Lin - Contemporary Amperex Technology Co., Limited</td>
</tr>
</tbody>
</table>
TECHNICAL SESSIONS

07-12-01: OPTIMIZATION, UNCERTAINTY, AND PROBABILITY
10/31/2023
4:00PM–5:45PM – ROOM 267

4:00PM
Reliability Analysis of Structures Controlled by Fractional Viscoelastic Dampers With Uncertain Parameters Modeled as Interval Variables
Technical Presentation: IMECE2023-119756
Alba Sofi - University “Mediterranea” of Reggio Calabria
Giuseppe Muscolino - University of Messina
Mario Di Paola - University of Palermo

4:21PM
A Comparative Study of Different Optimization Techniques in Modelling and Predictive Controls
Technical Paper Publication: IMECE2023-112145
Ma’moun Abu-Ayyad - Penn State Harrisburg
Yash Lad - Penn State Harrisburg
Anilchandra Attaluri - Penn State Harrisburg

4:42PM
Reliability-Based Design Optimization of Uncertain Linear Systems Subjected to Random Vibrations
Technical Paper Publication: IMECE2023-112546
Luis Enrique Ballesteros Martinez - The University of Arizona
Samy Missoum - The University of Arizona

5:03PM
Stochastic Stability of a Torsional-Flutter Energy Harvester in Thunderstorm-Like Winds: Duffing versus Hybrid Duffing – Van Der Pol Restoring Force Mechanisms
Technical Paper Publication: IMECE2023-116381
Luca Caracoglia - Northeastern University

5:24PM
Random Vibrations of Laminated Planar Frames
Technical Presentation: IMECE2023-111874
Richard Bachoo - University of the West Indies
Isaac Elishakoff - Florida Atlantic University

07-16-01: MULTI-FIELD COUPLING AND CONTROL
10/31/2023
4:00PM–5:45PM – ROOM 268

4:00PM
Multi-Channel Vibration Control of Conical Shells Based on Flexoelectric Effect
Technical Paper Publication: IMECE2023-113283
Haoran Li - Nanjing University of Aeronautics and Astronautics
Mu Fan - Nanjing University of Aeronautics and Astronautics

4:21PM
Actuation Behaviors of Flexoelectric and Light-Activated Shape Memory Polymer on Rings
Technical Paper Publication: IMECE2023-113412
Hongjie Li - Nanjing University of Aeronautics and Astronautics
Mu Fan - Nanjing University of Aeronautics and Astronautics
Yan Deng - Nanjing University of Aeronautics and Astronautics
Dan Wang - Nanjing University of Aeronautics and Astronautics
Hornsen Tzou - Nanjing University of Aeronautics and Astronautics
**4:42PM**

Comparative Study of Hyperelastic Constitutive Material Models for Understanding the Non-Linear Dynamics of an Engine-Mounted Hose

Technical Presentation: IMECE2023-111518
Sudhir Kaul - Western Carolina University
Chaitanya Borra - Western Carolina University

**5:03PM**

Dynamics of Photobending Liquid Crystal Elastomer Fibers

Technical Presentation: IMECE2023-119277
Ameneh (Neda) Maghsoodi - University of Southern California

**5:24PM**

Control of Corkscrew Swimming Locomotion of Soft-Millirobots in a Different Frequency

Technical Paper Publication: IMECE2023-111822
Jordan Scurry - Kennesaw State University
Jessica Trinh - Kennesaw State University
Christophe Bulang - Kennesaw State University
Jungkyu Park - Kennesaw State University
Dal Hyung Kim - Kennesaw State University

---

**07-10-03: MOBILE ROBOTS AND UNMANNED GROUND VEHICLES**

**10/31/2023**

**4:00PM–5:45PM – ROOM 269**

---

**4:00PM**

Autonomous Vehicle Guidance Using Neural Network and Random Forest Model

Technical Paper Publication: IMECE2023-113414
Tirth Gadhvi - HL Mando
Praveen Shankar - California State University, Long Beach

**4:21PM**

Numerical and Experimental Evaluation of an Enhanced Boundary Node Path-Planning Method for Agri-Robots in Dynamic Environments

Technical Paper Publication: IMECE2023-113231
R.A. Saeed - Free University of Bozen-Bolzano
Giovanni Carabin - Free University of Bozen-Bolzano
Renato Vidoni - Free University of Bolzano
Karl Von Ellenrieder - Free University of Bozen-Bolzano

**4:42PM**

Development of an Autonomous Robotic Snowplow for Residential Use

Technical Paper Publication: IMECE2023-114010
Alexander Suer - University of Cincinnati
Xun Yang - University of Cincinnati
Rui Yang - University of Cincinnati
Xuzhen You - University of Cincinnati
Zhihao Zhang - University of Cincinnati
Janet Dong - University of Cincinnati
5:03PM

Development of Portable Ground Control Station for Real-Time Data Monitoring of an Unmanned Surface Vessel
Technical Paper Publication: IMECE2023-114071
Rakshith Kotian - National Institute of Technology
Pruthviraj Umesh - National Institute of Technology
Kv Gangadharan - National Institute of Technology
Devdas Shetty - University of the District of Columbia

5:24PM

Continuously Variable Heterogeneous Density 3D Map Generation for Ubiquitous Drones
Technical Paper Publication: IMECE2023-114133
Akin Tatoglu - University of Hartford
Emma McClurkin - University of Hartford
Mohit Sai Vaka - University of Hartford
Rasheed Kelly - University of Hartford
Edward Diehl - University of Hartford
Kiwon Sohn - University of Hartford
Gonca Altuger-Genc - Farmingdale State College

WEDNESDAY, NOVEMBER 1

07-17-01: MACHINE LEARNING AND ARTIFICIAL INTELLIGENCE IN DYNAMICS, VIBRATIONS, AND CONTROL
11/1/2023
10:45AM–12:30PM – ROOM 272

10:45AM

Robotics Motion Planning for Complex Tasks in Partially Observable Environments Using Model-Free Reinforcement Learning
Technical Presentation: IMECE2023-112328
Junchao Li - The University of Iowa
Shaoping Xiao - The University of Iowa

11:06AM

Deep Learning for Nonlinear Stability Analysis in Dynamical Systems
Technical Presentation: IMECE2023-114113
Naim Mogharabin - University of Southern California
Bogdan I. Epureanu - University of Michigan-Ann Arbor
Amin Ghadami - University of Southern California

11:27AM

Interpretable Machine Learning Modeling of Li-Ion Batteries
Technical Presentation: IMECE2023-114190
Omidreza Ahmadzadeh - Temple University
Damoon Soudbaksh - Temple University

11:48AM

Using High-Fidelity Time-Domain Simulation Data to Construct Multi-Fidelity State Derivative Function Surrogate Models for Use in Control and Optimization
Technical Paper Publication: IMECE2023-112316
Athul Sundararajan - Colorado State University
Daniel Herber - Colorado State University
12:09PM

Deep Neural Network Based Saturated Adaptive Control of Muscles in a Lower-Limb Hybrid Exoskeleton
Technical Paper Publication: IMECE2023-112415
Jonathan Ting - Auburn University
Sujata Basyal - Auburn University
Brendon Allen - Auburn University

11:27AM

Performance Characteristics of Small-Scale Horizontal Axis Three Bladed Ocean Current Turbine: Computational Fluid Dynamics Investigation
Technical Paper Publication: IMECE2023-113892
Setare Sadeqi - The University of New Orleans
Nikolaos I. Xiros - The University of New Orleans
Shahab Rouhi - The University of New Orleans
Juliette W. Ioup - The University of New Orleans

10:45AM

Swarm Distributed Intelligence and Control for Autonomous Watercraft
Technical Paper Publication: IMECE2023-112704
Eleftherios C. Loghis - National Technical University of Athens
Nikolaos I. Xiros - The University of New Orleans

11:48AM

Input-Output Linearization Control of 1 DOF Electromagnetic Transducer
Technical Paper Publication: IMECE2023-116446
Georgios Tsakyridis - Aristotle University of Thessaloniki
Nikolaos I. Xiros - The University of New Orleans

11:06AM

Dynamometer Testing of Hydrokinetic Turbines in a Towing Tank Facility
Technical Paper Publication: IMECE2023-112837
Shahab Rouhi - The University of New Orleans
Nikolaos I. Xiros - The University of New Orleans
Setare Sadeqi - The University of New Orleans
Lothar Birk - The University of New Orleans

2:00PM

Predicting Multi-Mode Dynamic Responses of Structures Using Long Short-Term Memory Neural Networks
Technical Paper Publication: IMECE2023-112497
Yabin Liao - Embry-Riddle Aeronautical University, Prescott
Aviad Golan - Embry-Riddle Aeronautical University, Prescott
Mark Sensmeier - Embry-Riddle Aeronautical University, Prescott
2:21PM

A Deep Learning System to Quantify and Predict the Chewing Process of Foods

Technical Paper Publication: IMECE2023-112806
Shiyi Ren - The University of Auckland
Bangxiang Chen - The University of Auckland
Jaspreet Singh Dhupia - The University of Auckland
Martin Stommel - Auckland University of Technology
Weiliang Xu - The University of Auckland

2:42PM

Deep Q-Learning Based Optimal Energy Management of a Plug-in Hybrid Electric Vehicle

Technical Paper Publication: IMECE2023-113007
Vikas Narang - Indiana University–Purdue University Indianapolis
Kartavya Neema - Microsoft AI and Research
Sohel Anwar - Indiana University–Purdue University Indianapolis

3:03PM

Analysis of Roll Dynamics With Computer Vision

Technical Paper Publication: IMECE2023-113164
Fei Song - Schlumberger
Liangyu Xu - Schlumberger
Haitao Zhang - Schlumberger
Ke Li - Schlumberger

3:24PM

A Comparative Classification Study on the Use of Acoustic Emission Signals for Surface Roughness Condition Monitoring in End Milling of Stainless Steel

Technical Paper Publication: IMECE2023-114248
Issam Abu-Mahfouz - Penn State Harrisburg
Amit Banerjee - Penn State Harrisburg

Ahm Esfakur Rahman - Penn State Harrisburg

07-20-01: CONGRESS-WIDE SYMPOSIUM ON NDE &SHM: DYNAMICS, VIBRATION, AND CONTROL FOR STRUCTURAL HEALTH MONITORING APPLICATIONS
11/1/2023
2:00PM–3:45PM – ROOM 273

2:21PM

Better Understanding Physics Informed Neural Network Convergence Through Visualization and Nonconvex Optimization

Technical Presentation: IMECE2023-119924
Augustine Loshelder - The University of Alabama
Jiaqi Gong - The University of Alabama
Jiaze He - The University of Alabama
Xishi Zhu - The University of Alabama

2:42PM

Industrial Fluid Degradation Monitoring With an Electromechanical Impedance Active Sensor

Technical Paper Publication: IMECE2023-111669
Runye Lu - University of Michigan–Shanghai Jiao Tong University Joint Institute
Yanfeng Shen - University of Michigan–Shanghai Jiao Tong University Joint Institute

3:03PM

In-Situ Dynamic Strain Sensing Using Mechanized Air-Atomized Sprayed Flexible Nanocomposite Sensors

Technical Paper Publication: IMECE2023-113537
Pengfei Li - Northwestern Polytechnical University
Chao Xu - Northwestern Polytechnical University
Zhongqing Su - The Hong Kong Polytechnic University
3:03PM

Employing Machine Learning to Detect Post Resonance Backward Whirl in a Faulty Rotor System

Technical Paper Publication: IMECE2023-116335
Rafath Abdul Nasar - Khalifa University of Science and Technology
Mohammad A. Al-Shudeifat - Khalifa University of Science and Technology

07-17-03: MACHINE LEARNING AND ARTIFICIAL INTELLIGENCE IN DYNAMICS, VIBRATIONS, AND CONTROL
11/1/2023
4:00PM–5:45PM – ROOM 272

4:00PM

Real-World Deep Reinforcement Learning for Position Tracking of a Pendulum Driven by a Series Elastic Actuator

Technical Paper Publication: IMECE2023-116828
Ruturaj Sambhus - Virginia Tech
Aydin Gokce - Virginia Tech
Stephen Welch - Virginia Tech
Alexander Leonessa - Virginia Tech

5:03PM

Dynamic Analysis of Parametrically Excited Stable Rotors With Unbalance

Technical Paper Publication: IMECE2023-112382
Alessandro De Felice - Università degli Studi di Modena e Reggio Emilia
Silvio Sorrentino - Università degli Studi di Modena e Reggio Emilia

4:21PM

Data-Driven Reduction Analysis of Physical Dynamical Processes in Slewing Ring and Ball Bearing Regions of Rotating Structural Elements of Machinery

Technical Presentation: IMECE2023-111495
Ioannis Georgiou - National Technical University of Athens
Nikolaos Tsoulakos - National Technical University of Athens

5:24PM

Frequency Controls of O- and X-Carbon Nanotube Reinforced Rings With Light-Activated Shape Memory Polymers

Technical Paper Publication: IMECE2023-113237
Hongjie Li - Nanjing University of Aeronautics and Astronautics
Yan Deng - Nanjing University of Aeronautics and Astronautics
Mu Fan - Nanjing University of Aeronautics and Astronautics
Dan Wang - Nanjing University of Aeronautics and Astronautics
Hornsen Tzou - Nanjing University of Aeronautics and Astronautics

5:42PM

Cast Silicone Robotic Gripper in Underwater Applications

Technical Paper Publication: IMECE2023-113331
Wen Liu - Northern Kentucky University
Minchul Shin - Northern Kentucky University
Track 8: Energy

Topics:
8-1: Environmental Impact of Energy System
8-2: Energy Systems Components
8-3: 4E Analysis and Optimization of Energy Systems
8-4: Sustainable Energy Systems for Heating and Cooling
8-5: Energy-Related Multidisciplinary
8-6: AI for Energy Systems
8-7: Fundamentals and Applications of Thermodynamics
8-8: Design and Analysis and Optimization of Energy Conversion Systems
8-9: Electrochemical Energy Storage and Conversion Systems
8-10: Nuclear Energy: Plants, Design, Analysis, and Safety
8-11: Electric Vehicle Batteries as Multifunctional Energy Storages
8-12: Outstanding Young Investigators in Electrochemical Energy Conversion and Storage
8-13: Multi-Energy Systems
8-14: Thermal, Thermo-Mechanical and Thermo-Chemical Energy Storage Systems
8-15: Photovoltaics
8-16: Solar Thermal
8-17: Alternative Energy Conversion Tech (incl. Wind, Geothermal, Hydro, Ocean)
8-18: Sustainable Buildings and Communities
8-19: Innovations for Cleaner Energy Conversion Technologies
8-20: Novel Verification, Validation, and Uncertainty Quantification (VVUQ) Techniques and Approaches for Energy Applications

ACKNOWLEDGMENT

TRACK ORGANIZERS

Track Organizer: Jun Xu, The University of North Carolina at Charlotte
Track Co-Organizer: Adriano Sciacovelli, University of Birmingham
Track Co-Organizer: Guangdong Zhu, National Renewable Energy Laboratory

TOPIC ORGANIZERS:

Adriano Sciacovelli, University of Birmingham
Aggrey Mwesigye, University of Calgary
Andrea Lazzaretto, University of Padova
Binghe Liu, Chongqing University
Elham Sahraei, Temple University
Enrico Dal Cin, University of Padova
George Antonakos
George Nelson, The University of Alabama in Huntsville
George-Rafael Domenikos, Stevens Institute of Technology
Gianluca Carraro, University of Padova
Guangdong Zhu, National Renewable Energy Laboratory
Hakan Ozaltun, Idaho National Laboratory
Hamidreza Najafi, Florida Institute of Technology
Helena Navarro, University of Birmingham
Irene Koronaki
Josh McGlue
Jovica Riznic, Canadian Nuclear Safety Commission
Jun Xu, The University of North Carolina at Charlotte
Kevin Dowding, Sandia National Laboratories
Lorena Giordano, ENEA, Italian National Agency for New Technologies, Energy and Sustainable Economic Development
Lorenzo Ciappi
Lu Wang, Shenzhen Technology University
Lubing Wang, Ningbo University
TECHNICAL SESSIONS

Michail Nitsas, National Technical University of Athens
Michelle Pagano, ASME
Partha Mukeherjee
Pei Dong
Piero Danieli
Prahit Dubey, Nikola Motor Company
Rafael Domenikos, Stevens Institute of Technology
Roberto Capata, Sapienza Universita di Roma
Roberto Carapellucci, University of L’Aquila, Italy
Sergio Rech, University of Padova
Soumik Banerjee, Washington State University
Thanh Toan Tran
Wahiba Yaici, Natural Resources Canada/CanmetENERGY Research Centre
Xiang Gao, The University of North Carolina at Charlotte
Xianglin Li, Washington University in St. Louis
Yue Zhou, The University of Texas at Dallas

Lu Wang, Shenzhen Technology University
Lubing Wang, Ningbo University
Michail Nitsas, National Technical University of Athens
Nawshad Arslan Islam, The University of Texas at El Paso
Prahit Dubey, Nikola Motor Company
Roberto Capata, Sapienza Universita di Roma
Roberto Carapellucci, University of L’Aquila, Italy
Sergio Rech, University of Padova
Shawn Duan, Saint Martin’s University
Soumik Banerjee, Washington State University
Tatiana Morosuk, Technische Universitat Berlin
Thanh Toan Tran
Ting Wang, The University of New Orleans
Wahiba Yaici, Natural Resources Canada/CanmetENERGY Research Centre
Xiang Gao, The University of North Carolina at Charlotte
Xianglin Li, Washington University in St. Louis
Yue Zhou, The University of Texas at Dallas

SESSION CHAIRS:

Adriano Sciacovelli, University of Birmingham
Aggrey Mwesigye, University of Calgary
Andrea Lazzaretto, University of Padova
Binghe Liu, Chongqing University
Elham Sahraei, Temple University
Enrico Dal Cin, University of Padova
George Nelson, The University of Alabama in Huntsville
Gianluca Carraro, University of Padova
Guangdong Zhu, National Renewable Energy Laboratory
Hakan Ozaltun, Idaho National Laboratory
Hamidreza Najafi, Florida Institute of Technology
Helena Navarro, University of Birmingham
Josh McTigue
Jovica Riznic, Canadian Nuclear Safety Commission
Jun Xu, The University of North Carolina, Charlotte
Lorena Giordano, ENEA, Italian National Agency for New Technologies, Energy and Sustainable Economic Development
Lorenzo Ciappi
TECHNICAL SESSIONS

TRACK 8: ENERGY
MONDAY, OCTOBER 30

08-01-01: ENVIRONMENTAL IMPACT OF ENERGY SYSTEMS
10/30/2023
10:45AM–12:30PM – ROOM 280

10:45AM
Waste Not Wall-E Not: An Analysis of Pathways for a Circular Economy in Oil and Gas
Technical Presentation: IMECE2023-120187
Sarah Reynolds - The University of Texas at Austin
Yael R. Glazer - The University of Texas at Austin
Michael E. Webber - The University of Texas at Austin

11:06AM
Technical Paper Publication: IMECE2023-109928
Ahmed Kamel - University of Texas Permian Basin
Ahmed Alzahabi - University of Texas Permian Basin
Yazmin Romero - University of Texas Permian Basin

11:27AM
Life Cycle Assessment of Waste Coal and Biomass Co-Fired Power Plant With Carbon Capture and Storage Technologies
Technical Paper Publication: IMECE2023-112790
Surja Sarkar - Georgia Southern University
Prakash Bhoi - Georgia Southern University

11:48AM
Numerical Study on CO₂ Hydrate Formation in a Bubble Column Reactor From Flue Gas Mixtures
Technical Paper Publication: IMECE2023-113704
Awan Bhati - The University of Texas at Austin
Aritra Kar - The University of Texas at Austin
Vaibhav Bahadur - The University of Texas at Austin

12:09PM
On the Prediction of Fuel Consumption for Dual-Fuel Low-Speed Marine Engines
Technical Paper Publication: IMECE2023-116939
Amanda Rimpel da Silva - Federal University of Rio Grande
Gean França - Federal University of Rio Grande
Juan Ordonez - Florida State University
Cristofer Hood Marques - Federal University of Rio Grande

08-02-01: ENERGY SYSTEMS COMPONENTS
10/30/2023
10:45AM–12:30PM – ROOM 288

10:45AM
Optimization of Data Acquisition System Developed for Wind Tunnel in Low-Speed Environment
Technical Paper Publication: IMECE2023-109673
Manohar Chidurala - Western Kentucky University
Mirza Cirak - Western Kentucky University
Matt Clouse - Western Kentucky University
Troy Stewart - Western Kentucky University
Boston Wimmer - Western Kentucky University
TECHNICAL SESSIONS

11:06AM
Effects of Foil Camber and Non-Zero Angle of Attack on The Unsteady Forces Produced by a Turbomachine Ingesting Turbulence

Technical Paper Publication: IMECE2023-110418
Isaiah Owsley - Penn State
Margalit Goldschmidt - Penn State
Amanda Hanford - Penn State
Peter Lysak - Penn State
Michael Jonson - Penn State

11:27AM
Sand Wear and Performance Deterioration of Electrical Submersible Pumps

Technical Paper Publication: IMECE2023-110354
Tanmay Tatu - The University of Tulsa
Haiwen Zhu - The University of Tulsa
David Baillargeon - ChampionX
Paul Song - ChampionX
Michael Rumbaugh - ChampionX
Adedayo Tychus - The University of Tulsa
Sai Praveen Adiraju - The University of Tulsa
Hong-Quan Zhang - The University of Tulsa

11:48AM
Numerical Study of Liquid Piston Compression Using Large-Eddy Simulation and Volume-of-Fluid Approach

Technical Paper Publication: IMECE2023-110906
Thien Nguyen - Oak Ridge National Laboratory
Joe Rendall - Oak Ridge National Laboratory
Steve Kowalski - Oak Ridge National Laboratory

12:09PM
ICE Performance Optimization With Double Supercharging With E-Booster

Technical Paper Publication: IMECE2023-112248
Roberto Capata - Sapienza Università di Roma
Alfonso Calabria - Telematic University eCampus
Federico Donato - Sapienza Università di Roma
Leone Martellucci - Sapienza Università di Roma

08-04-01: SUSTAINABLE ENERGY SYSTEMS FOR HEATING AND COOLING
10/30/2023
2:00PM–3:45PM – ROOM 280

2:00PM
A Municipal Waste Heat Dissipation Modular Approach for Open Field Heated Agriculture

Technical Paper Publication: IMECE2023-113727
Robert Dell - The Cooper Union and University of Iceland
Nicholas Mitchell - Maxentric Technologies LLC
Ritesh Mehta - Zenesis Engineering/Architecture
Maya Grutman - The Cooper Union
Christopher Mignano - The Cooper Union
Olafur Petur Palsson - University of Iceland
Runar Unnthorsson - University of Iceland

2:21PM
Simultaneously Harvesting the Universe and the Sun for Radiative Cooling and Power

Technical Presentation: IMECE2023-120107
Pramit Ghosh - The Pennsylvania State University
Xinsheng Wei - The Pennsylvania State University
Hanze Liu - The Pennsylvania State University
Linxiao Zhu - The Pennsylvania State University
**2:42PM**

**A Statistical Machine Learning Approach to Predict Residential HVAC Usage With Lagged Environmental Predictors**

Technical Paper Publication: IMECE2023-112141

Jashanjeet Baath - Texas A&M University

Madelyn Little - Texas A&M University

Anirban Bhattacharya - Texas A&M University

Arkasama Bandyopadhyay - Texas A&M University

---

**3:03PM**

**Thermal Performance of a Geothermal Source High-Temperature Heat Pump for District Heating: Comparison of Single-Stage and Cascade Vapor Compression Cycles**

Technical Paper Publication: IMECE2023-113084

Devon Dickinson - University of Calgary

An Mai - University of Calgary

Aleksandra Govedaric - University of Calgary

Roman Shor - University of Calgary

Aggrey Mwesigye - University of Calgary

---

**3:24PM**

**Assessing the Costs and Emissions Tradeoffs of Interconnecting ERCOT With the National Grids as a Reliability Measure**

Technical Presentation: IMECE2023-119553

Drew Kassel - The University of Texas at Austin

Joshua Rhodes - The University of Texas at Austin

Michael Webber - The University of Texas at Austin

---

**08-09-01: ELECTROCHEMICAL ENERGY STORAGE AND CONVERSION SYSTEMS**

**10/30/2023**

**2:00PM–3:45PM – ROOM 288**

---

**2:00PM**

**Probing the Role of Heterogeneities in Solid-State Battery Cathode**

Technical Presentation: IMECE2023-120003

Kaustubh Girish Naik - Purdue University

Bairav Sabarish Vishnugopi - Purdue University

Partha P. Mukherjee - Purdue University

---

**2:21PM**

**Internal Short Circuit of Lithium Metal Batteries Under Mechanical Abuse**

Technical Presentation: IMECE2023-120071

Liu Yue - Chongqing University

---

**2:42PM**

**The Effects of Si Monoxide Particle Distribution on the Impedance of Composite Anode**

Technical Presentation: IMECE2023-119616

Xiang Gao - The University of North Carolina at Charlotte

Jun Xu - The University of North Carolina at Charlotte

---

**3:03PM**

**An Experimental and Numerical Study on Charged 21700 Lithium-Ion Battery Cells Under Dynamic Loads**

Technical Presentation: IMECE2023-112277

Marian Bulla – Altair Engineering Inc.

Elham Sahraei - Temple University

Stefan Kolling - University of Applied Sciences (THM), Giessen
3:24PM

Mechanical Characterization of Li-Ion Cells and the Calibration of Numerical Models Using Proper Generalized Decomposition

Technical Paper Publication: IMECE2023-113228

Alexander Schmid - Graz University of Technology
Angelo Pasquale - Arts et Métiers Institute of Technology
Christian Ellersdorfer - Graz University of Technology
Marco Raffler - Graz University of Technology
Victor Champaney - Arts et Métiers Institute of Technology
Mustapha Ziane - Arts et Métiers Institute of Technology
Francisco Chinesta - Arts et Métiers Institute of Technology
Florian Feist - Graz University of Technology

08-04-02: SUSTAINABLE ENERGY SYSTEMS FOR HEATING AND COOLING

10/30/2023

4:00PM–5:45PM – ROOM 280

4:00PM

Computational Fluid Dynamics Study of the Performance of Solar Air Heater

Technical Paper Publication: IMECE2023-112995

Kieran Ames - Portland State University
Chris Mccarthy - Portland State University
Ian Clark - Portland State University
Justin Weathers - Portland State University
Kyle Mastrandrea - Portland State University
Timothy Tudor - Portland State University
Faryar Etesami - Portland State University
Xiaowei Zhu - Portland State University
4:21PM
Long-Term Thermal Performance Evaluation of a Novel Energy Pile for Space Heating and Cooling in a Cold Climate
Technical Paper Publication: IMECE2023-112783
Charaka Beragama Jathunge - University of Calgary
Amirhossein Darbandi - University of Calgary
Nayoung Kim - Toronto Metropolitan University
Sahar Taslimi Taleghani - Toronto Metropolitan University
Seth B. Dworkin - Toronto Metropolitan University
Aggrey Mwesigye - University of Calgary

4:42PM
A Comparative Study of the Long-Term Performance of Vertical U-Tube Borehole Heat Exchanger and Foundation Piles in a Cold Climate
Technical Paper Publication: IMECE2023-112353
Philip Adebayo - University of Calgary
Charaka Beragama Jathunge - University of Calgary
Roman Shor - University of Calgary
Abdulmajeed Mohamad - University of Calgary
Aggrey Mwesigye - University of Calgary

5:03PM
Efficient Radiative Cooling of Low-Cost Baso4 Nanoparticle-Paper Dual-Layer Thin Films
Technical Presentation: IMECE2023-120260
Andrea Felicelli - Purdue University
Xiulin Ruan - Purdue University
George Chiu - Purdue University
Jie Wang - Purdue University
Endrina Forti - Purdue University
Sami El Awad Azrak - Purdue University
Joseph Peoples - Purdue University
Jeffrey Youngblood - Purdue University

5:24PM
A Literature Review of Automated Fault Detection and Diagnostics for HVAC Systems
Technical Paper Publication: IMECE2023-111611
Hugh Allen-Magande - Kennesaw State University
Javad Khazaii - Kennesaw State University
Amin Esmaeili - Kennesaw State University

08-09-02: ELECTROCHEMICAL ENERGY STORAGE AND CONVERSION SYSTEMS
10/30/2023
4:00PM–5:45PM – ROOM 288

4:00PM
Interactions Between Si Monoxide and Graphite Particles in Composite Anode Materials
Technical Presentation: IMECE2023-111071
Xiangao Gao - The University of North Carolina at Charlotte
Jun Xu - The University of North Carolina at Charlotte

4:21PM
Multi-Physics Simulation for Morphology Design of Si Anode
Technical Paper Publication: IMECE2023-113107
Parth Bansal - University of Illinois at Urbana-Champaign
Yumeng Li - University of Illinois at Urbana-Champaign
4:42PM

Recovering and Regenerating of Spent Anode Material From the Scrap of Used Lithium Ion Batteries

Technical Paper Publication: IMECE2023-114474
Hammad Al-Shammari - Jouf University
Siamak Farhad - The University of Akron

5:03PM

Physics Based Electrolyte Evaporation Model for Use in Li-Ion Thermal Runaway Simulations

Technical Paper Publication: IMECE2023-113690
Dylan Poe - Purdue University
Mohammad Parhizi - Electrochemical Safety Research Institute, UL Research Institutes
Ankur Jain - The University of Texas at Arlington
Gozdem Kilaz - Purdue University
Jason Ostanek - Purdue University

5:24PM

Investigating Na+ Ion Storage Behavior of Distinctive Hybrid Structure of WS2NT Encapsulated SiOC Fibers

Technical Presentation: IMECE2023-113869
Sonjoy Dey - Kansas State University
Gurpreet Singh - Kansas State University

TUESDAY, OCTOBER 31

08-09-03: ELECTROCHEMICAL ENERGY STORAGE AND CONVERSION SYSTEMS
10/31/2023
10:15AM–12:00PM – ROOM 270

10:15AM

Valuation and Cost Optimization of the Proton Exchange Membrane Water Electrolyzer Technologies Considering the Degradation Phenomena

Technical Paper Publication: IMECE2023-112963
Efat Mohammadi - The University of Memphis
Alexander Headley - The University of Memphis

10:36AM

Parametric Optimization of Degradation Reduction of PEM Fuel Cell for Hydrogen Fuel Cell Heavy-Duty Truck

Technical Paper Publication: IMECE2023-113108
Huu Linh Nguyen - Chungnam National University
Younghyeon Kim - Chungnam National University
Jaesu Han - Chungnam National University
Sangseok Yu - Chungnam National University
10:57AM

Development of Nickel-ZIF-8 Doped Nitrogen Reduced Graphene Oxide Catalytic Materials for PEM Fuel Cell

Technical Paper Publication: IMECE2023-113169

Hassan Shirzadi Jahromi - Western Michigan University
Shivi Saxena - Western Michigan University
Sudharsan Sridhar - Western Michigan University
Muralidhar K. Ghantasala - Western Michigan University
Ramakrishna Guda - Western Michigan University
Elena A. Rozhkova - Argonne National Laboratory

11:18AM

Enhanced Performance of Fuel Cell Polymer Electrolyte Membrane Assisted by Plasma-Based Surface Structuring

Technical Presentation: IMECE2023-112356

Jun Hyuk Ko - Korea Institute of Science and Technology
Sang Jin Park - Korea Institute of Science and Technology
Myoung-Woon Moon - Korea Institute of Science and Technology

11:39AM

Plasma Liquid Gas (PLG) Systems, Establishing a Plasma Dielectric Barrier Discharge-Mode With Liquid Electrodes for Energy Conversion

Technical Paper Publication: IMECE2023-114276

Kamau Wright - The Cooper Union
J.P. Patton - The Cooper Union
Christos Potamianos - The Cooper Union
Juntao Cui - The Cooper Union
Nikolas Arsenlis - The Cooper Union
Daniel Kim - The Cooper Union
Jordan Klahr - The Cooper Union

10:15AM

An Experimental and Computational Study of Mechanically and Dynamically High Loaded Separators for Lithium-Ion Batteries

Technical Paper Publication: IMECE2023-112272

Marian Bulla - Altair Engineering Inc.
Elham Sahraei - Temple University
Stefan Kolling - University of Applied Sciences (THM), Giessen

10:36AM

Mechanical Deformation and Damage Characterization of the Polymer Separator for Lithium-Ion Batteries

Technical Presentation: IMECE2023-113838

Edris Akbari - Louisiana State University
George Z Voyiadjis - Louisiana State University

10:57AM

Towards Crash-Safety Design & Analysis of Electric Vehicle's Battery Module and Pack

Technical Presentation: IMECE2023-113569

Shantanu Ramesh Shinde - Temple University
Yihan Song - Temple University
Elham Sahraei - Temple University
11:18AM
Characterization of the Damage of Shell Casing of Cylindrical Lithium-Ion Battery at Different Temperatures
Technical Presentation: IMECE2023-113544
George Z. Voyiadjis - Louisiana State University
Edris Akbari - Louisiana State University

11:39AM
A Tough Polymer Electrolyte for Multifunctional Structural Energy Storage Applications
Technical Presentation: IMECE2023-113382
Yu-Che Chang - University of Massachusetts Dartmouth
Parya Teymoory - University of Massachusetts Dartmouth
Roger Tessier - University of Massachusetts Dartmouth
Caiwei Shen - University of Massachusetts Dartmouth

11:59AM
Evaluating the Limits of Electrosorption-Based Electrodes for Capacitive Deionization Using Thermodynamic Principles
Technical Presentation: IMECE2023-112477
Daniel Moreno - Missouri State University
Devon Parker - Missouri State University
Pablo Skaggs - Missouri State University

02:00PM
Optimal Sizing of Distribution-Scale Energy Storage
Technical Presentation: IMECE2023-120157
Jena Medina - The University of Texas at Austin
Leah Pretorius - The University of Texas at Austin
Emily Beagle - The University of Texas at Austin
Joshua Rhodes - The University of Texas at Austin
Michael Webber - The University of Texas at Austin

02:21PM
Improvement of Screw Compressor Performance by Rotor Profile Modification to Reduce Mechanical Losses
Technical Paper Publication: IMECE2023-112721
Sumit Patil - Kirloskar Pneumatic
Suraj Abdan - Kirloskar Pneumatic
Neeraj Asati - Kirloskar Pneumatic
Nikola Stosic - City, University of London
Ahmed Kovacevic - City, University of London

02:42PM
Characterization of 3D Printed Porous Flow Fields
Technical Presentation: IMECE2023-113205
Abel Solomon - Washington University in Saint Louis
Xianglin Li - Washington University in St. Louis

03:03PM
Evaluating the Performance of Dry and Spray-Assisted Cooling Methods for Industrial Thermal Management Through Modeling and Experimental Data Validation
Technical Paper Publication: IMECE2023-112349
Spencer Jones - Tennessee Technological University
Ethan Languri - Tennessee Technological University
08-11-02: ELECTRIC VEHICLE BATTERIES AS MULTIFUNCTIONAL ENERGY STORAGES
10/31/2023
2:00PM–3:45PM – ROOM 271

Evaluation of Mechanical Integrity Behavior of 18650 Lithium-Ion Batteries Through Penetration Impact Test Depending on State of Charge
Technical Presentation: IMECE2023-114304
Amin Tabaei - Louisiana State University
Edris Akbari - Louisiana State University
George Voyiadis - Louisiana State University

2:21PM
Validation of Sahraei Failure Model on Two Different Cylindrical Cells
Technical Presentation: IMECE2023-112794
Yihan Song - Temple University
Elham Sahraei - Temple University
Marian Bulla - Altair Engineering Inc.

2:42PM
Robust Validation of Various Lithium-Ion Battery Pouch Cells' Mechanical Behavior for Electric Vehicle Safety Using a Single Methodology
Technical Presentation: IMECE2023-113083
Huzefa Patanwala - Temple University
Elham Sahraei - Temple University

08-13-01: MULTI-ENERGY SYSTEMS
10/31/2023
4:00PM–5:45PM – ROOM 270

3:03PM
High-Performance Carbon Fiber Composite as Anode for Structural Lithium Metal Battery
Technical Presentation: IMECE2023-112351
Zhongjiu Yang - The University of Texas at Dallas
Yue Zhou - The University of Texas at Dallas

4:00PM
Solar Driven Polygeneration System Using sCO₂ Cycle, Multi-Effect Desalination and Absorption Cooling
Technical Paper Publication: IMECE2023-116876
Sattam Alharbi - University of Hail

4:21PM
System Parameter Design for Community Microgrid Energy System Based on a Bi-Level Optimization Model
Technical Paper Publication: IMECE2023-113149
Jiangshan Liu - Shanghai Jiao Tong University
Youyi Bi - Shanghai Jiao Tong University

4:42PM
Technical Paper Publication: IMECE2023-113238
Enrico Dal Cin - University of Padova
Gianluca Carraro - University of Padova
Andrea Lazzaretto - University of Padova
George Tsatsaronis - Technische Universität Berlin
5:03PM

Hydrates Based Carbon Capture System in Texas: a Techno-Economic Perspective
Technical Paper Publication: IMECE2023-114432
Palash V. Acharya - The University of Texas at Austin
Awan Bhati - The University of Texas at Austin
Vaibhav Bahadur - The University of Texas at Austin

5:24PM

The Role of Multi-Energy Systems in the Energy Transition: An Indian Company Perspective
Technical Presentation: IMECE2023-112547
Anurag Gupta - Oil India Ltd.
Pankaj Kumar Goswami - Oil India Ltd.
Biswajit Gogoi - Oil India Ltd.

4:00PM–5:45PM – ROOM 271

4:00PM

Optical and Thermal Modeling of a Heat Pipe Evacuated Tube Solar Collector With Primary CPC-Involuted Reflector
Technical Paper Publication: IMECE2023-113859
Celine Lim - University of Missouri-Kansas City
Sarvenaz Sobhansarbandi - University of Missouri-Kansas City

4:21PM

Renewable Convective Heating by the Metallic Strips Heated via a Solar Vacuum Tube
Technical Paper Publication: IMECE2023-113673
Ali Alshweiki - University of the District of Columbia
Tiwaloluwa Olukeye - University of the District of Columbia
Wondwosen Demisse - University of the District of Columbia
Pawan Tyagi - University of the District of Columbia

4:24PM

Optical and Thermal Investigation of Novel Cavity Receiver of Solar Parabolic Dish Collector for Process Heating Applications
Technical Paper Publication: IMECE2023-111860
Abhinav Rajan - Indian Institute of Technology Madras
K.S. Reddy - Indian Institute of Technology Madras

5:03PM

Numerical Investigation of the Effect of the Inclusion of Turbulators in an Evacuated Tube Solar Collector Air Heat Exchanger
Technical Paper Publication: IMECE2023-113952
Tiwaloluwa Olukeye - University of the District of Columbia
Samba Gaye - University of the District of Columbia
Ali Alshweiki - University of the District of Columbia
Pawan Tyagi - University of the District of Columbia

5:24PM

Porous Nanochannel Wick for High Vapor Generation Rates
Technical Presentation: IMECE2023-120218
Durgesh Ranjan - Syracuse University
An Zou - Syracuse University
Shalabh Maroo - Syracuse University
WEDNESDAY, NOVEMBER 1

08-10-01: ADVANCE MATERIALS FOR ELECTROCHEMICAL ENERGY
11/1/2023
10:45AM–12:30PM – ROOM 274

10:45AM
Deformation and Fracture Characteristics of Li-Ion Battery Solid Electrolytes
Technical Presentation: IMECE2023-120286
Shuman Xia - Georgia Institute of Technology

11:06AM
Development of High-Rate Lithium-Ion Batteries Using Porous Carbon Derived From Kansas Soybeans
Technical Presentation: IMECE2023-119844
Kyamra Marma - University of Kansas
Lin Liu - University of Kansas

11:27AM
Bio-Waste Lignin Carbon Coupled With Sodium Towards Ultrahigh Capacitance
Technical Presentation: IMECE2023-119718
Manish Neupane - The University of Maine
Qiangu Yan - U.S. Department of Agriculture
Zhiyong Cai - U.S. Department of Agriculture
Yingchao Yang - The University of Maine

11:48AM
Saturation Behavior of Wetting and Non-Wetting Phase in a Porous Media With Irregular Solid Shape
Technical Presentation: IMECE2023-112827
Amirhossein Sarabandi - Washington University in St. Louis
Xianglin Li - Washington University in St. Louis

12:09PM
Understanding of the Nail Penetration Tests Repeatability
Technical Presentation: IMECE2023-111013
Jun Xu - The University of North Carolina at Charlotte
Xiang Gao - The University of North Carolina at Charlotte

08-05-02: ENERGY-RELATED MULTIDISCIPLINARY II
11/1/2023
10:45AM–12:30PM – ROOM 275

10:45AM
Circularity: Understanding the Energy and Environmental Tradeoffs of 3D Printing With Waste Plastics
Technical Presentation: IMECE2023-120033
Yael Glazer - The University of Texas at Austin
Eesha Bilal - The University of Texas at Austin
Carolyn Seepersad - The University of Texas at Austin
Michael Webber - The University of Texas at Austin

11:06AM
Determining the Relationship Between Degree of Polymerization and Tensile Strength of Paper Used for Insulating Transformers
Technical Presentation: IMECE2023-119919
Tejaswi Soori - The University of Texas at Austin
Karey Maynor - University of Texas at Austin
Mark Hamalian - University of Texas at Austin
Awan Bhati - The University of Texas at Austin
Yue Xu - The University of Texas at Austin
Keith Nelson - The University of Texas at Austin
Robert Hebner - The University of Texas at Austin
Vaibhav Bahadur - The University of Texas at Austin
11:27AM
The Effect of Laminar and Turbulent Flow on Phase Change Materials for Energy Recovery
Technical Presentation: IMECE2023-113601
Mahmoud Elsharafi - Midwestern State University

11:48AM
Assessing the Lubrication Performance of Sunflower Oil Modified With Montmorillonite Clay (MMT) Nanoparticles for Industrial Applications
Technical Paper Publication: IMECE2023-114757
Md Mashfiqur Rahman - The University of Texas Rio Grande Valley
Md Abu Sayeed Biswas - The University of Texas Rio Grande Valley
Laura Peña-Páras - Universidad de Monterrey
Demófilo Maldonado-Cortés - Universidad de Monterrey
Javier A. Ortega - The University of Texas Rio Grande Valley

12:09PM
Design and Analysis of Thermal System to Study Impact of Extreme Heat on Potato Canopies
Technical Presentation: IMECE2023-119857
Maxwell Saviello - Washington State University
Fatlum Rexhepi - Washington State University
Jacob Blauer - Washington State University
Mark Pavek - Washington State University
Soumik Banerjee - Washington State University

08-14-01: THERMAL, THERMO-MECHANICAL, AND THERMO-CHEMICAL ENERGY STORAGE SYSTEMS
11/1/2023
10:45AM–12:30PM – ROOM 289

10:45AM
System-Level and Thermodynamic Design of a Low-Cost Thermal Energy Storage System Utilizing Reclaimed Minerals
Technical Presentation: IMECE2023-120251
Reza Baghaei Lakeh - University of California Los Angeles
Tihamer Engel - California Polytechnic State University, Pomona
Kuu Botchway - Waste Salt Technologies

11:06AM
Comparison of Various Thermochemical Salt Hydrates Stabilized by Crystalline Nanocellulose
Technical Presentation: IMECE2023-120322
Sangeet Karna - North Dakota State University
Daniel Blake - Montana State University
Adam Gladen - North Dakota State University
Dilpreet Bajwa - Montana State University

11:27AM
An Investigation of Thermochemical Energy Storage Using Chemical Looping for Concentrated Solar Power Plants
Technical Presentation: IMECE2023-113463
Imran Mohammed - Northern Illinois University
Tariq Shamim - Northern Illinois University
11:48AM


Technical Paper Publication: IMECE2023-109148

Nurayn Tiamiyu - University of Oklahoma
Joap Hoffmann - University of Stellenbosch

12:09PM

Simulations of Pre-Mixed Droplet Injection for Achieving Isothermal Compressed Air Energy Storage

Technical Paper Publication: IMECE2023-112569

Juliet Simpson - University of Virginia
Chao Qin - Washington State University
Eric Loth - University of Virginia

11:27AM

Defect Engineering of WO₃ by Rapid Flame Reduction for Efficient Photoelectrochemical Conversion of Methane Into Liquid Oxygenates

Technical Presentation: IMECE2023-119665

Ho Kun Woo - University of Illinois at Urbana-Champaign
Ankit Kumar Gautam - University of Illinois at Urbana-Champaign
Jaxir Barroso Martinez - University of Illinois at Urbana-Champaign
Arthur P. Baddorf - Oak Ridge National Laboratory
Kai Zhou - University of Illinois at Urbana-Champaign
Yoon Young Choi - University of Illinois at Urbana-Champaign
Jiajun He - University of Illinois at Urbana-Champaign
Alexander Mironenko - University of Illinois at Urbana-Champaign
Joaquin Rodriguez Lopez - University of Illinois at Urbana-Champaign
Lili Cai - University of Illinois at Urbana-Champaign

11:48AM

Performance Assessment of Switchgrass and Waste Coal Co-Fired Power Plant

Technical Presentation: IMECE2023-113066

Prakash Bhoi - Georgia Southern University
Dziwodo Abotsi - Georgia Southern University
David Obando Ortegon - Georgia Southern University
Ashish Manandhar - The Ohio State University
Ajay Shah - The Ohio State University

10:45AM–12:30PM – ROOM 290

10:45AM

System-Level and Techno-Economic Analysis of Green Ammonia Production in the Permian Basin of Texas

Technical Presentation: IMECE2023-119920

Karey Maynor - The University of Texas at Austin
Tejaswi Soori - The University of Texas at Austin
Vaibhav Bahadur - The University of Texas at Austin

11:06AM

Modified ε-Mtu Model for Reverse Osmosis and Its Application in Green Hydrogen Grade Water Production

Technical Presentation: IMECE2023-119793

Vishnu Sree Shanthanu Katakam - The University of Texas at Austin
Vaibhav Bahadur - The University of Texas at Austin
TECHNICAL SESSIONS

12:09PM

Numerical Investigations of Shock Wave Reactors Employing Head-On Colliding Shock Waves
Technical Paper Publication: IMECE2023-111760
Pejman Akbari - California State Polytechnic University, Pomona
Stefan Tüchler - New Wave Hydrogen Inc.
Colin D. Copeland - Simon Fraser University
James Shaffer - West Virginia University
Omid Askari - West Virginia University

2:00PM

Droplets Combustion Characteristics Comparison of Single Component and Multicomponent Diesel Surrogates With Petroleum-Based Commercial Diesel Fuel
Technical Paper Publication: IMECE2023-113189
A.S.M. Sazzad Parveg - The University of Iowa
Albert Ratner - The University of Iowa

2:21PM

On the Potential of Thermoelectric Generators in Improving the Thermal Efficiency of Heavy-Duty Natural Gas Engines
Technical Presentation: IMECE2023-120052
Ratnak Sok - Waseda University
Jin Kusaka - Waseda University

2:42PM

Framework for Adsorption-Based AWH Device Level Performance Characterization
Technical Presentation: IMECE2023-120270
David Keisar - Massachusetts Institute of Technology
Adela Chenyang Li - Massachusetts Institute of Technology
Bachir El Fil - Massachusetts Institute of Technology

3:03PM

Energy Aware Motion Planning for Underwater Gliders With Energy Harvesting Capabilities
Technical Paper Publication: IMECE2023-114132
Camilo Ordonez - Florida State University
Jonathan Boylan - Florida State University
Samuel Duval - Florida State University
Sara Bradley - Florida State University
Patrick Molnar - Florida State University
Camilo Nanclares - Florida State University
Michael Johnson - Florida A&M University
Julian Osorio - National Renewable Energy Laboratory
Juan C. Ordonez - Florida State University
08-05-03: ENERGY-RELATED MULTIDISCIPLINARY III

11/1/2023

2:00PM–3:45PM – ROOM 275

2:00PM

Computational Tool for Analysis of Vehicle-to-Home as Home Backup Solution During Power Outages

Technical Presentation: IMECE2023-119938
Lea Daniel - The University of Texas at Austin
Carey King - The University of Texas at Austin
David Tuttle - The University of Texas at Austin
William Paxton - Volkswagen Group Innovation

2:21PM

An Assessment of Vehicle Electrification Within the United States Army

Technical Paper Publication: IMECE2023-114117
Gregory A. Langone - United States Military Academy
Kyle J. Kass - United States Military Academy
Noah A. Lozano - United States Military Academy
Paul F. Budoff - United States Military Academy
Benjamin S. West - United States Military Academy
Jacob T. Lueders - United States Military Academy
Charles R. Levine - United States Military Academy
Bret P. Van Poppel - United States Military Academy
F. Todd Davidson - United States Military Academy

2:42PM

Application of Convex Optimization for Economic Dispatch and DC Optimal Load Flow Problem

Technical Paper Publication: IMECE2023-112716
Rithvik Reddy Adapa - Southern Illinois University Edwardsville
Xin Wang - Southern Illinois University Edwardsville

3:03PM

Microgrid Partitioning: An Impact Assessment of Integrating a Photovoltaic System With Electrical Energy Storage Devices

Technical Paper Publication: IMECE2023-112792
Ban Baniatta - Al Hussein Technical University
Ahmad Azzam - Al Hussein Technical University
Emad Abdelsalam - Al-Hussein Technical University
Hamza Nawafah - University of Wisconsin-Milwaukee
Hassan Qandil - University of North Texas
Feras Kafiah - Al-Hussein Technical University

3:24PM

Improving Facility Energy Efficiency Through Energy Cost Analysis

Technical Paper Publication: IMECE2023-113133
Qi Guo - McNeese State University
Adam Courville - McNeese State University
Qiu Liu - McNeese State University

08-14-02: THERMAL, THERMO-MECHANICAL, AND THERMO-CHEMICAL ENERGY STORAGE SYSTEMS

11/1/2023

2:00PM–3:45PM – ROOM 289

2:00PM

Experimental Study of Spray Cooling Technique in Liquid Piston Gas Compression at Different Initial Pressure Levels

Technical Paper Publication: IMECE2023-112647
Barah Ahn - Baylor University
Paul I. Ro - Baylor University
<table>
<thead>
<tr>
<th>Time</th>
<th>Title</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>2:21PM</td>
<td>Repurposed Desalination Salt: A Low-Cost Thermal Energy Storage Medium</td>
<td>Konnor Theroux - California State Polytechnic University, Pomona, Christopher N. Salerno - California State Polytechnic University, Pomona, Brian C. Camey - Risk Management Professionals, Alex Salas - California State Polytechnic University, Pomona, Tom Sephton - Sephton Water Inc., Reza Baghaei Lakeh - University of California, Los Angeles</td>
</tr>
<tr>
<td>2:42PM</td>
<td>Exploring Inexpensive Carbon Materials for Improving the Performance of Perovskite Solar Cells</td>
<td>Saket Chand Mathur - Wichita State University, Wei Wei - Wichita State University</td>
</tr>
<tr>
<td>3:03PM</td>
<td>Prediction of the Maximum Energy Harvest Considering Year-Around Sky Coverage Conditions and Optimized Setup Angles of Fixed PV Panels</td>
<td>Ammar Gwesha - The University of Arizona, Peiwen Li - The University of Arizona, Yasir Alfulayyih - The University of Arizona</td>
</tr>
<tr>
<td>2:00PM</td>
<td>Artificial Intelligence Based Modelling for Energy Output Predictions of Renewables</td>
<td>George-Rafael Domenikos - Stevens Institute of Technology, Shima Hajimirza - Stevens Institute of Technology, Gizem Acar - Stevens Institute of Technology</td>
</tr>
<tr>
<td>2:21PM</td>
<td>Unmanned Aerial Vehicles (UAVs) in Smart Factories: Exploring the Potential for Energy Savings Through Wireless Communication Technologies</td>
<td>Fadi Hantouli - Kennesaw State University, David A. Guerra-Zubiaga - Kennesaw State University, Amin Esmaeili - Kennesaw State University, Sumit Chakravarty - Kennesaw State University, Lashaundra Perry - Kennesaw State University, Paul Forsberg - Kennesaw State University, Gershom Richards - Georgia Tech Research Institute</td>
</tr>
</tbody>
</table>
TECHNICAL SESSIONS

2:42PM
Alternative Methods for an Energy Efficient and Effective Adsorbent Regeneration
Technical Presentation: IMECE2023-120330
Bachir El Fil - Massachusetts Institute of Technology

3:03PM
Statistical Analysis and Computational Modelling of Superfluid Helium
Technical Paper Publication: IMECE2023-112776
George-Rafael Domenikos - National Technical University of Athens; Stevens Institute of Technology
Alexander V. Mantzaris - University of Central Florida

3:24PM
Advanced Exergetic Evaluation of a Stig Cycle and Cooled Inlet Air Gas Turbine Powered by Mixtures of Natural Gas and Hydrogen in Tropical Climates
Technical Paper Publication: IMECE2023-113679
Juan Fajardo - Universidad Tecnológica de Bolívar
Deibys Barreto - Universidad Tecnológica de Bolívar
Daniel Yabrudy - Universidad Tecnológica de Bolívar
Andrés Piña-Martinez - Université de Lorraine

08-08-01: DESIGN ANALYSIS AND OPTIMIZATION OF ENERGY CONVERSION SYSTEMS - 1
11/1/2023
4:00PM–5:45PM – ROOM 274

4:00PM
Improving Fuel Efficiency of a Boat by Retrofitting Propeller Modelling and Experimental Validation
Technical Paper Publication: IMECE2023-113318
Satish Kumar Bonthu - University of Iceland
Hordur Sigurbjarnarson - North Sailing
Stefán Gunnarsson - North Sailing
Runar Unnthorsson - University of Iceland

4:21PM
Optimization of Heat Exchanger Network via Pinch Technology: A Case Study of a Dairy Facility in Italy
Technical Paper Publication: IMECE2023-113372
Simona Abbate - University of L'Aquila
Marco Di Bartolomeo - University of L'Aquila
Lorena Giordano - ENEA, Italian National Agency for New Technologies, Energy and Sustainable Economic Development
Miriam Benedetti - ENEA, Italian National Agency for New Technologies, Energy and Sustainable Economic Development
Roberto Carapellucci - University of L'Aquila

4:42PM
Model Based Evaluation of a Turbocharged Engine Exhaust Heat Recovery by Auxiliary Turbine
Technical Paper Publication: IMECE2023-113692
Roberto Carapellucci - University of L'Aquila
Davide Di Battista - University of L'Aquila
TECHNICAL SESSIONS

5:03PM

Exergoeconomic Analysis of a Liquid Hydrogen Regasification Cogeneration System
Technical Presentation: IMECE2023-116620
Tatiana Morosuk - Technische Universität Berlin
Jimena Incer-Valverde - Technische Universität Berlin
George Tsatsaronis - Technische Universität Berlin
Deepu Karippai - Technische Universität Berlin

08-05-04: ENERGY-RELATED MULTIDISCIPLINARY IV
11/1/2023
4:00PM–5:45PM – ROOM 275

4:00PM

Hydrogen’s Role and Risks in the Energy and Water Nexus
Technical Presentation: IMECE2023-120112
Emily Beagle - The University of Texas at Austin
Justin Shih - The University of Texas at Austin
Yael Glazer - The University of Texas at Austin
Michael Webber - The University of Texas at Austin

4:21PM

A Framework for Evaluating the Climate Effects of Fugitive Hydrogen Emissions
Technical Presentation: IMECE2023-120207
Esther G. Goita - The University of Texas at Austin
Emily Beagle - The University of Texas at Austin
Ansh Nasta - GTI Energy
Derek Wissmiller - GTI Energy
Arvind Ravikumar - The University of Texas at Austin
Michael E. Webber - The University of Texas at Austin

4:42PM

Development of Liquid Hydrogen Fuel Storage Tank for Coastal Ships
Technical Presentation: IMECE2023-119540
Hyun-Seok Kim - Korea Research Institute of Ships and Ocean Engineering
Gun Woo Kim - Korea Research Institute of Ships and Ocean Engineering
Jae Hwan Jung - Korea Research Institute of Ships and Ocean Engineering
Byoungjae Park - Korea Research Institute of Ships and Ocean Engineering

5:03PM

Deicing With In Situ Electrolysis
Technical Presentation: IMECE2023-117045
Saurabh Nath - Massachusetts Institute of Technology
Henri-Louis Girard - Massachusetts Institute of Technology
Ha Eun David Kang - Massachusetts Institute of Technology
Srinivas Bengaluru Subramanyam - Massachusetts Institute of Technology
Yang Shao-Horn - Massachusetts Institute of Technology
Kripa K. Varanasi - Massachusetts Institute of Technology

5:24PM

Quantification of the Energy Saving Associated With Early Detection of Faulty Operation of Rooftop Units
Technical Paper Publication: IMECE2023-111615
Hugh Allen-Magande - Kennesaw State University
Javad Khazaii - Kennesaw State University
Amin Esmaeili - Kennesaw State University
08-19-03: INNOVATIONS FOR CLEANER ENERGY
CONVERSION TECHNOLOGIES
11/1/2023
4:00PM–5:45PM – ROOM 290

4:00PM
Data-Driven Modeling for Accurate State-of-Charge Estimation of Li-Ion Batteries
Technical Presentation: IMECE2023-116346
Renato Rodriguez - Temple University
Damoon Soudbakhsh - Temple University

4:21PM
Using Time Constants of Li-Ion Batteries for Safety Evaluation
Technical Presentation: IMECE2023-114314
Mohsen Derakhshan - Temple University
Damoon Soudbakhsh - Temple University

4:42PM
Technical Paper Publication: IMECE2023-113475
Gabriel Carrera Rivera - Universidad Internacional del Ecuador
Mayken Espinoza Andaluz - Escuela Superior Politécnica del Litoral
Brayan Ordóñez-Saca - Escuela Superior Politécnica del Litoral
Jordy Santana-Villamar - Escuela Superior Politécnica del Litoral

5:03PM
Water-in-Diesel Emulsion: Torque, Fuel Consumption, and Emission Analysis
Technical Paper Publication: IMECE2023-113822
Francisco Brojo - Universidade da Beira Interior
Pedro Oliveira - C-MAST

5:24PM
The Effect of Char Particle Morphology on the Drag Coefficient Under Combustion Condition Using Micro-CT and Particle-Resolving Simulation
Technical Paper Publication: IMECE2023-114681
Dongyu Liang - Lawrence Technological University
THURSDAY, NOVEMBER 2

08-18-01: SUSTAINABLE BUILDINGS AND COMMUNITIES
11/2/2023
10:15AM–12:00PM – ROOM 273

10:15AM

Fairness Metrics of Electricity Pricing for Residential Buildings
Technical Presentation: IMECE2023-119677
Hohyun Lee - Santa Clara University
Hannah Covington - Santa Clara University
Brian Woo-Shem - Santa Clara University
Chenli Wang - National Institute of Standards and Technology
Thomas Roth - National Institute of Standards and Technology
Yuhong Liu - Santa Clara University
Yi Fang - Santa Clara University

10:36AM

Assessing the Potential for Building Electricity Demand Management to Mitigate ERCOT Load Shed During Winter Storm Uri
Technical Presentation: IMECE2023-119551
Matthew J. Skiles - The University of at Austin
Joshua D. Rhodes - The University of at Austin
Michael E. Webber - The University of at Austin

10:57AM

Determination of Renewable Energy Capacity by Stochastic Optimization
Technical Paper Publication: IMECE2023-112276
Yogesh Manoharan - The University of Memphis
Alexander John Headley - The University of Memphis

11:18AM

An Energy Transition Pathway Towards Building Decarbonization – Coupling CHP Units With Renewable Energy and Energy Storage Systems
Technical Paper Publication: IMECE2023-113992
Yasin Naman - Northeastern University
Mansour Zenouzi - Wentworth Institute of Technology
Gregory J. Kowalski - Northeastern University

11:39AM

A Framework on Performing Virtual Building Energy Audit
Technical Paper Publication: IMECE2023-113116
Qi Guo - McNeese State University
Andrew Chiasson - University of Dayton
Sulaiman Almoatham - University of Dayton

08-17-01: ALTERNATIVE ENERGY CONVERSION TECH (INCL. WIND, GEOTHERMAL, HYDRO, OCEAN)
11/2/2023
10:15AM–12:00PM – ROOM 274

10:15AM

Power Take-Off Design Study for a Small-Scale Oscillating Surge Wave Energy Converter for Powering the Blue Economy Applications
Technical Paper Publication: IMECE2023-112259
Jackson Wills - University of Minnesota
Nathan Tom - National Renewable Energy Laboratory
Senu Sirnivas - National Renewable Energy Laboratory
Renewable Energy Resources in the Long-Term Sustainability of Water Desalination As a Freshwater Source
Technical Paper Publication: IMECE2023-113293
Peter Oviroh Ozaveshe - University of Johannesburg
Kingsley Ukoba - University of Johannesburg
Tien-Chien Jen - University of Johannesburg

Piezoelectric Energy Harvesting Array of Tethered Bodies Utilizing Flow-Induced Vibrations
Technical Paper Publication: IMECE2023-113408
Marina Fam - University of Windsor
Vesselina Roussinova - University of Windsor
Vesselin Stoilov - University of Windsor

Impact of Number of Blades and Solidity on the Performance of a Darrieus Vertical Axis Wind Turbine With Helical Blades
Technical Paper Publication: IMECE2023-113651
Ahmed S. Saad - Menoufia University
Mahmoud Ahmed - Egypt-Japan University of Science and Technology

An Investigation of the Influences of Diameter Ratio and Attaching Angle on the Performance of a Helical-Bladed Combined Darrieus-Savonius Wind Turbine
Technical Paper Publication: IMECE2023-113686
Ahmed S. Saad - Menoufia University
Mahmoud Ahmed - Egypt-Japan University of Science and Technology

Exploration of Recovering Waste Heat in a Cascade Liquefied Natural Gas (LNG) Plant
Technical Paper Publication: IMECE2023-110807
Shisir Acharya - Energy Conversion and Conservation Center/The University of New Orleans
Ting Wang - Energy Conversion and Conservation Center/The University of New Orleans

Development of an Elaborated Fuel Cell Stack Model for Drone Fuel Cell System With Liquid Cooling
Technical Paper Publication: IMECE2023-113224
Jongbin Woo - Chungnam National University
Younghyeon Kim - Chungnam National University
Sangseok Yu - Chungnam National University

Control Strategy of Compressor Surge for Dual Stack Fuel Cell by Model Based Design
Technical Paper Publication: IMECE2023-114134
Yoora Choi - Chungnam National University
Jaesu Han - Chungnam National University
Sangseok Yu - Chungnam National University

Analysis of 100kW Fuel Cell Electric Vehicle System Component Characteristics in Case of Sudden Load Change Using Modeling
Technical Paper Publication: IMECE2023-114186
Younghyeon Kim - Chungnam National University
Sangseok Yu - Chungnam National University
11:39AM

Thermomechanical Performance of Full-Size Curved Fuel Plates

Technical Presentation: IMECE2023-109798
Hakan Ozaltun - Idaho National Laboratory

08-18-02: INDOOR ENVIRONMENTAL QUALITY AND BUILDING MATERIALS FOR ENERGY SUSTAINABILITY

11/2/2023
2:00PM–3:45PM – ROOM 273

2:00PM

Enhancing Thermal Comfort and Air Quality in a Classroom Using Air Filtration Boxes

Technical Paper Publication: IMECE2023-113886
Hussein Kokash - Wayne State University
Khalil Khanafer - University of Michigan-Flint
Mihai Burzo - University of Michigan-Flint

2:21PM

The Impact of Indoor Environment on Engineering Students' Inhibition Control Ability

Technical Paper Publication: IMECE2023-113055
Mehri Mobarak-Omoumi - The University of Oklahoma
Md Tanvir Ahad - The University of Oklahoma
Javeed Kittur - The University of Oklahoma
Zahed Siddique - The University of Oklahoma

2:42PM

CFD-Based Ventilation Assessment of a University Building With an Integrated Windcatcher in Egypt

Technical Paper Publication: IMECE2023-113719
Moataz Eldakrouy - The American University in Cairo
Sherif Goubran - The American University in Cairo
Omar Abdelaziz - The American University in Cairo

3:03PM

Field Demonstration of Pinhole Insulation Technology for Energy Efficiency Retrofits in Connecticut

Technical Paper Publication: IMECE2023-112709
Celia Chacko - University of Connecticut
Ravi Gorthala - University of Connecticut
Prathamesh Patil - University of Connecticut

3:24PM

Analysis of Sustainable Building-Insulation Material Using Biochar and Natural Fiber

Technical Paper Publication: IMECE2023-113643
Sourov Kumar Mondal - University of California, Merced
Hector Gomez - University of California, Merced
Ziad Nasef - University of California, Merced
Gerardo Diaz - University of California, Merced

08-21-01: NUCLEAR ENERGY FORUM: PLANTS, DESIGN, ANALYSIS, AND SAFETY

11/2/2023
2:00PM–3:45PM – ROOM 274

2:00PM

Bison Verification and Validation Activities for TRISO

Technical Paper Publication: IMECE2023-111271
Aysenur Toptan - Idaho National Laboratory
Jason D. Hales - Idaho National Laboratory
Wen Jiang - Idaho National Laboratory
2:21PM
Opportunities and Recommendations: Integrating Advanced Reactors for Industrial Heat and Electricity Users
Technical Paper Publication: IMECE2023-111303
Elizabeth Worsham - Idaho National Laboratory
Chandrakanth Bolisetty - Idaho National Laboratory
Daniel Mikkelson - Idaho National Laboratory
Rami Saeed - Idaho National Laboratory
Byung-Hee Choi - Idaho National Laboratory
Jakub Toman - Idaho National Laboratory
Frederick Joseck - Idaho National Laboratory
Nipun Popli - Idaho National Laboratory
George Griffith - Idaho National Laboratory

3:24PM
Hip Diffusion Bonding Process Model Development for Fabrication of U-10Mo LEU Fuel
Technical Presentation: IMECE2023-110392
C.J. Taylor Mason - Pacific Northwest National Laboratory
Patrick Mcneff - Pacific Northwest National Laboratory
Rajib Kalsar - Pacific Northwest National Laboratory
Yucheng Fu - Pacific Northwest National Laboratory
Kriston P. Brooks - Pacific Northwest National Laboratory
Naveen K Karri - Pacific Northwest National Laboratory
Vineet Joshi - Pacific Northwest National Laboratory

2:42PM
Oxide Growth Predictions During an Advanced Test Reactor (ATR) Powered Axial Locator Mechanism (PALM) Cycle
Technical Paper Publication: IMECE2023-112428
Jason W. Barney - Battelle Energy Alliance
Dong O. Choe - Battelle Energy Alliance
Seth M. Kilby - Battelle Energy Alliance

3:03PM
Thermal Transport Study of KCl-UCl3 Using Molecular Dynamics Simulations
Technical Paper Publication: IMECE2023-112656
Simon Bratescu - Kennesaw State University
Jungkyu Park - Kennesaw State University

2:21PM
Effect of Upstream Deflector Plate Position on the Performance of Savonius Rotors
Technical Paper Publication: IMECE2023-113989
Deepak D. Prasad - The University of the South Pacific
Marisilina Pesamino - The University of the South Pacific
Amenatave Cavuilati - The University of the South Pacific
Krishnll Ram - The University of the South Pacific
Mohammed Rafiuddin Ahmed - The University of the South Pacific
2:42PM

Design of a New Rocket Stove and Performance Testing With Different Varieties of Wood

Technical Paper Publication: IMECE2023-114255
Aseli Tuicolo - The University of the South Pacific
Kavitesh Gounder - The University of the South Pacific
Mohammed Rafiuddin Ahmed - The University of the South Pacific

3:03PM

A Simplified Methodology to Predict Performance of IC Engines Operating With Bio-Syngas

Technical Paper Publication: IMECE2023-115174
Sandeep Sabnis - Don Bosco Institute of Technology
Srinivas Seethamraju - Indian Institute of Technology Bombay

4:21PM

Carbon Footprint of Electricity Generation in a Conceptual Bioenergy Power Plant With Carbon Capture and Storage

Technical Paper Publication: IMECE2023-112331
Martha Nemer - Escuela Superior Politecnica del Litoral
Jorge Duque-Rivera - Escuela Superior Politecnica del Litoral
Daniel Aviles - Escuela Superior Politecnica del Litoral
Daniel Salas - Escuela Superior Politecnica del Litoral
Angel D. Ramirez - Escuela Superior Politecnica del Litoral

4:42PM

Highlights of Accelerated Degradation Mechanisms for Polymer Electrolyte Fuel Cell

Technical Paper Publication: IMECE2023-112585
Brayan Ordoñez-Saca - Escuela Superior Politecnica del Litoral
Mayken Espinoza Andaluz - Escuela Superior Politecnica del Litoral
Jordy Santana-Villamar - Escuela Superior Politecnica del Litoral
Martin Andersson - Lund University

5:03PM

A Computational Study of Sustainable Hydrogen Production Using High-Pressure Modular Gasifier

Technical Paper Publication: IMECE2023-112695
Sumit Chanda - The University of Texas at El Paso
Anika Farhat Tasnim - The University of Texas at El Paso
Daniel Reyes - The University of Texas at El Paso
Ahsan Choudhuri - The University of Texas at El Paso
Nawshad Arslan Islam - The University of Texas at El Paso

5:24PM

A Comparison of the Designs of Shell-Type and Core-Type Solid State Transformers With Convex Optimization

Technical Paper Publication: IMECE2023-114166
Puneeth Raj Lambada - Southern Illinois University Edwardsville
Xin Wang - Southern Illinois University Edwardsville
Track 9: Engineering Education

Topics:
9-1: Curriculum Innovations, Pedagogy, and Learning Methodologies
9-2: Globalization of Engineering and Study Abroad Education
9-3: Engineering Accreditation, Curricular Reforms and Revisions, Assessment, and ABET
9-4: Sustainability, Efficiency, Competencies for Industry 4.0, Learning Factories, Ethical Dimensions, and Safety Issues
9-7: Problem Solving Techniques in Engineering and Technology Education, Research Methodologies, Practice, Workshops, and Seminars
9-8: Distance/Online Engineering Education, Models and Enabling Technologies
9-9: Pre-College (K-12) STEM, RET - University, School and Industry Alliance (USIA)
9-10: Teaching Laboratories, Hands-on Experiences, Embedding Novel Manufacturing Concepts in ME Programs, and Technology-Aided Lecturing
9-11: Engineering Research Innovation and Research Experiences for Undergraduates
9-12: Mechatronics, Automation, Robotics, and Control Engineering

ACKNOWLEDGMENT

TRACK ORGANIZERS
Track Organizer: Salim Azzouz, Midwestern State University
Track Co-Organizer: Anabela Alves, Universidade de Minho
Track Co-Organizer: Subha Kumpaty, Milwaukee School of Engineering

TOPIC ORGANIZERS:
Aaron Armstrong
Amir Karimi, The University of Texas at San Antonio
Anabela Alves, Universidade de Minho
Emine Celik Foust
Hephzibah Kumpaty, University of Wisconsin-Whitewater
Khalid Alzebdah
Mahmoud Elsharafi, Midwestern State University
Mohammad Mahinfalah, Milwaukee School of Engineering
Nazmul Islam, The University of Texas Rio Grande Valley
Pranaya Pokharel, Midwestern State University
Salim Azzouz, Midwestern State University
Subha Kumpaty, Milwaukee School of Engineering
Vedang Chauhan, Western New England University
Vito Moreno, University of Connecticut
Wael Mokhtar, Grand Valley State University
Zeki Ilhan, Midwestern State University

SESSION CHAIRS:
Amir Karimi, The University of Texas at San Antonio
Anabela Alves, University of Minho
Emine Foust, United States Military Academy
Hephzibah Kumpaty, University of Wisconsin-Whitewater
Joseph Rencis, The University of Texas at Dallas
Mahmoud Elsharafi, Midwestern State University
Mohammad Mahinfalah, Milwaukee School of Engineering
Nazmul Islam, The University of Texas Rio Grande Valley
Pranaya Pokharel, Midwestern State University
Salim Azzouz, Midwestern State University
Shuvra Das, University of Detroit
Subha Kumpaty, Milwaukee School of Engineering
Vedang Chauhan, Western New England University
Vito Moreno, University of Connecticut
Wael Mokhtar, Grand Valley State University
Zeki Ilhan, Midwestern State University
TECHNICAL SESSIONS

TRACK 9: ENGINEERING EDUCATION
MONDAY, OCTOBER 30

09-01-01: CURRICULUM INNOVATIONS, PEDAGOGY AND LEARNING METHODOLOGIES - I
10/30/2023
10:45AM–12:30PM – ROOM 267

10:45AM
Human Factors, Physiological Signals, Emotions, What Else?

Technical Paper Publication: IMECE2023-111516
Celina P. Leao - University of Minho
Isabel Loureiro - University of Minho
Vinicius Silva - University of Minho
Susana P. Costa - University of Minho

11:06AM
Design and Development of a Geometric Dimensioning and Tolerancing Course

Technical Paper Publication: IMECE2023-112112
Tikran Kocharian - Grand Valley State University
Jeremy Burns - Grand Valley State University
Sanjivan Manoharan - Grand Valley State University

11:27AM
Industry Certification in Simulation Technology as a Part of the Lecture Course

Technical Paper Publication: IMECE2023-112286
Ivana Milanovic - University of Hartford
Sunil Kumar - New York University Abu Dhabi
Tom Eppes - University of Hartford
Kalyan Goparaju – Ansys, Inc.

11:48AM
Importance of Course Portfolio Assessment in an Online Environment

Technical Presentation: IMECE2023-111465
Mysore Narayanan - Miami University

12:09PM
Implementing Augmented Reality in a First-Year Mechanical Engineering Course

Technical Paper Publication: IMECE2023-112643
Oziel Rios - The University of Texas at Dallas
Dani Fadda - The University of Texas at Dallas

09-05-01: APPLIED MECHANICS, DYNAMIC SYSTEMS, EXPERIMENTAL AND COMPUTATIONAL METHODS, ADVANCED MATERIALS, AND TESTING
10/30/2023
10:45AM–12:30PM – ROOM 268

10:45AM
Understanding Surface Form Error: Beyond the GD&T Circularity/Roundness or Cylindricity Callout

Technical Paper Publication: IMECE2023-109694
Chittaranjan Sahay - University of Hartford
Suhash Ghosh - University of Hartford

11:06AM
Introducing Machine Learning in Undergraduate Mechanical Engineering Mechatronics Classes

Technical Paper Publication: IMECE2023-112655
Jinki Kim - Georgia Southern University
Junghun Choi - Georgia Southern University
Jongyeop Kim - Georgia Southern University

11:06AM
TECHNICAL SESSIONS

11:27AM
Teaching Engineering Dynamics Using Interactive Pedagogies and Entrepreneurial Minded Learning
Technical Paper Publication: IMECE2023-113166
Vedang Chauhan - Western New England University

11:48AM
Leveraging Virtual Laboratory Modules for Digital Engagement and Active Learning in Mechanical Engineering
Technical Paper Publication: IMECE2023-113187
Can Uysalel - University of California, San Diego
Anshal Jain - University of California, San Diego
Maziar Ghazinejad - University of California, San Diego

09-01-02: CURRICULUM INNOVATIONS, PEDAGOGY, AND LEARNING METHODOLOGIES - II
10/30/2023
2:00PM–3:45PM – ROOM 267

2:00PM
Stimulating Critical Thinking Through Report Peer-Review in a Project-Based Learning by Engineering Freshman Students
Technical Paper Publication: IMECE2023-112542
Anabela C. Alves - University of Minho
Celina P. Leão - University of Minho
M. Florentina Abreu - University of Minho
Carina Pimentel - University of Minho
M. T. Malheiro - University of Minho
Sérgio Oliveira - University of Minho
M. Piedade Ramos - University of Minho
Jorge Miguel Oliveira - University of Minho

2:21PM
A Project-Based Pedagogical Approach for Mechanical Design Course in Extremely Small Classes
Technical Paper Publication: IMECE2023-113671
Guodong Guo - Texas A&M University
Jonathan Rodríguez - Texas A&M University
Dominga Guerrero - Texas A&M University
Omar Alejandro Tapia - Texas A&M University

2:42PM
Teaching a Developed First-Year Flipped Classroom
Technical Paper Publication: IMECE2023-113991
P.L. Stephan Thamban - The University of Texas at Dallas
Dani Fadda - The University of Texas at Dallas
Oziel Rios - The University of Texas at Dallas

3:03PM
Impact of Prior Design Experiences on Undergraduate Design Success
Technical Paper Publication: IMECE2023-114185
Cory Kado - Florida Polytechnic University
Alexander Murphy - Florida Polytechnic University
Matt Bohm - Florida Polytechnic University
Elisabeth Kames - Florida Polytechnic University

3:24PM
Mechanical Engineering Undergraduate Curriculum Improvement at the University of Iowa
Technical Presentation: IMECE2023-118638
Shaoping Xiao - University of Iowa
TECHNICAL SESSIONS

09-06-01: FLUID MECHANICS, AEROSPACE SYSTEMS, THERMODYNAMICS, HEAT TRANSFER, ENERGY SYSTEMS, AND RENEWABLE ENERGY APPLICATIONS
10/30/2023
2:00PM–3:45PM – ROOM 268

2:00PM

Design and Development of a 3D Printed Active Thermal Management System for Electromechanical Actuators (EMA) in Aircrafts

Technical Paper Publication: IMECE2023-114204
Hans Matthew Baes - University of the District of Columbia
Herve Sandja - University of the District of Columbia
Abdulbasit Telha - University of the District of Columbia
Hamza Abdelaziz - University of the District of Columbia
Jiajun Xu - University of the District of Columbia

2:21PM

A Sonic Throttle Body Characterization Flow Bench Adapted for Fluids Laboratory Instruction via Energy Engineering Laboratory Module Pedagogy

Technical Paper Publication: IMECE2023-114300
Carlo Wisniewski - University of Florida
Sean Niemi - University of Florida
Matthew Traum - University of Florida

2:42PM

Approximate Solutions to Governing Heat Conduction Equations With Uniform Heat Generation in Semi-Infinite Plates

Technical Paper Publication: IMECE2023-109419
Salim Haidar - Grand Valley State University
Alireza Mohammadzadeh - Grand Valley State University

3:03PM

Lunar Dust Tolerance and Mitigation of Space Suits Through Nano Fabricated Electrostatic Cleaning

Technical Paper Publication: IMECE2023-114192
Voss Harrigan - University of the District of Columbia
Korey Carter - University of the District of Columbia
Marcus Gilmore - University of the District of Columbia
Jiajun Xu - University of the District of Columbia

3:24PM

Students Difficulties in Understanding Limitation of Application of Thermal Resistance Relations in an Introductory Heat Transfer Course

Technical Presentation: IMECE2023-119858
Amir Karimi - The University of Texas at San Antonio

09-03-01: GENERAL TOPICS ON ENGINEERING EDUCATION
10/30/2023
4:00PM–5:45PM – ROOM 267

4:00PM

Teaching Design Justice Principles in Engineering Courses to Create a Broader Appreciation of Design

Technical Presentation: IMECE2023-113635
Shuvra Das - University of Detroit

4:21PM

Modeling Refrigeration Systems With Simscape and MATLAB: A Component-by-Component Approach

Technical Presentation: IMECE2023-119724
Andrew Greff - MathWorks
**4:42PM**

**Rules and Procedures in Academia: Do They Help or Hurt?**

Technical Paper Publication: IMECE2023-113587

Shuvra Das - University of Detroit
Darrell Kline - University of Detroit Mercy
David Pistru - Purdue University
Ron Bonnstetter - TTI Success Insights

**5:03PM**

**How to Accentuate Student Performance in an Online Environment**

Technical Presentation: IMECE2023-112295

Mysore Narayanan - Miami University

---

**09-07-01: ENGINEERING EDUCATION PROJECTS, NOVEL MANUFACTURING, AND ROBOTICS**

**10/30/2023**

**4:00PM–5:45PM – ROOM 268**

---

**4:00PM**

**3D Printing for Innovative Engineering Solutions “The Environmental Challenge”**

Technical Paper Publication: IMECE2023-112875

Yasser Al Hamidi - Texas A&M University
Marcin Kozusznik - Texas A&M University at Qatar
Mamoun Al-Rawashdeh - Texas A&M University at Qatar

**4:21PM**

**Effective Engineering Education With Open-Source Textbook on Bond Graph and Lagrangian Methods**

Technical Presentation: IMECE2023-118652

Mehrzad Tabatabaian - British Columbia Institute of Technology

---

**4:42PM**

**Four Purchasing Levels in Prototyping**

Technical Paper Publication: IMECE2023-112950

Dani Fadda - The University of Texas at Dallas
Oziel Rios - The University of Texas at Dallas
Joshua Summers - The University of Texas at Dallas

**5:03PM**

**Part 1: Gyroscopic Control of Robotic Smart Vehicles Using SO(3)**

Technical Paper Publication: IMECE2023-113518

Jason Chen - The Cooper Union
Eunkyu Kim - The Cooper Union
Calder Leppitsch - The Cooper Union
Benjamin Meiner - The Cooper Union
Daniel Zaretsky - The Cooper Union
Thorstein Rykkje - Western Norway University of Applied Sciences
Dirk M. Luchtenburg - The Cooper Union
Thomas Impelluso - Western Norway University of Applied Sciences

---

**5:24PM**

**Engineering Education Projects: Thermal Imaging for Robotic Joining Operations**

Technical Paper Publication: IMECE2023-114389

Michael Mauk - Drexel University
Arjuna Kartihikeyan Senthivel Kavitha - Drexel University
Nijanthan Vasudevan - Drexel University
Tzu-Liang (Bill) Tseng - The University of Texas at El Paso
Yunshun Chiou - Drexel University
TUESDAY, OCTOBER 31

09-01-03: CURRICULUM INNOVATIONS, PEDAGOGY, AND LEARNING METHODOLOGIES - III
10/31/2023
10:15AM–12:00PM – ROOM 272

10:15AM
Weaving Digital Storytelling in Introductory Design Thinking Course for Mechanical Engineers
Technical Paper Publication: IMECE2023-114559
Sridhar Condoor - Parks College

10:36AM
Ungrading in a Mechanics Curriculum: Identifying Gaps in Student Metacognition
Technical Paper Publication: IMECE2023-114972
Anne Schmitz - University of Wisconsin-Stout

10:57AM
Development of Interactive Teaching Aid Material for Engineering Courses:
Technical Paper Publication: IMECE 2023-116323, IMECE2023-116716
Dustin Higby - Texas A&M University Texarkana
Sulaman Pashah - Texas A&M University Texarkana

11:18AM
Modernizing Engineering Education in 2023: Minimizing Academic Honesty Policies, Treating Grades as Measurements, Individualizing Educational Experiences, and Incorporating More Project-Based Learning to Better Bridge the Gap Between High School and Career
Technical Paper Publication: IMECE2023-116716
Ivaylo Nedyalkov - University of New Hampshire

11:39AM
An Examination of Factors Effecting Student Success in Upper Division Engineering Courses
Technical Presentation: IMECE2023-120326
Amir Karimi - The University of Texas at San Antonio

09-08-01: DISTANCE/ONLINE ENGINEERING EDUCATION, MODELS, AND ENABLING TECHNOLOGIES
10/31/2023
10:15AM–12:00PM – ROOM 273

10:15AM
Implementation of an Artificial Intelligence (AI) Instructional Support System in a Virtual Reality (VR) Thermal-Fluids Laboratory
Technical Paper Publication: IMECE2023-112683
Dennis Ayre - California State Polytechnic University, Pomona
Carolyn Dougherty - California State Polytechnic University, Pomona
Yitong Zhao - California State Polytechnic University, Pomona

10:36AM
Ergonomic Design of a Virtual Proctor System With Reliable Face Recognition and Tracking
Technical Paper Publication: IMECE2023-112826
Zhou Zhang - Middle Tennessee State University
Yizhe Chang - California State Polytechnic University, Pomona
Sven Esche - Stevens Institute of Technology
10:57AM

Teaching Engineering Courses in the Digital Transformation Era

Technical Paper Publication: IMECE2023-114307
Miguel X. Rodriguez-Paz - Tecnologico de Monterrey
Jorge A. Gonzalez-Mendivil - Tecnologico de Monterrey
Israel Zamora-Hernandez - Tecnologico de Monterrey

11:18AM

Impact of Online Versus In-Person Group Work on Behavioral Peer Evaluations in Engineering Capstone Team Projects

Technical Paper Publication: IMECE2023-111718
Juliana Mishur - University of Florida
Sean Niemi - University of Florida
Janna Underhill - University of Florida
Matthew Traum - University of Florida

11:39AM

Online Development Plan for an Applied Thermodynamics Course

Technical Paper Publication: IMECE2023-112320
Dani Fadda - The University of Texas at Dallas
Roopa Vinay - The University of Texas at Dallas
Oziel Rios - The University of Texas at Dallas

2:00PM

Satisfaction and Intercultural Competence During an Erasmus Program: A Case With Industrial Engineering Undergraduate Students at the University of Minho, Portugal

Technical Paper Publication: IMECE2023-113730
Violeta Carvalho - University of Minho
Carla Rocha - University of Minho
Jorge Campinos - University of Minho
Senhorinha Teixeira - University of Minho
Filipa D. Viera - University of Minho
Cristina S. Rodrigues - University of Minho

2:21PM

Modular Teaching Materials for Flexible Mechanical Engineering Curriculum

Technical Presentation: IMECE2023-120210
Emma Smith Zbarsky - MathWorks
Valentin Boutrouche - MathWorks
Mehdi Vahab - MathWorks
Will Greenwood - MathWorks

2:42PM

Best Fits, Dark Horses, and Cognitive Style: Investigating Differences in Design Solution Perceptions

Technical Paper Publication: IMECE2023-111358
Daniel Henderson - The Pennsylvania State University
Krina Patel - University of California, Berkeley
Kathryn Jablokow - The Pennsylvania State University
Nil Klicyay-Ergin - The Pennsylvania State University
Neeraj Sonalkar - Stanford University

3:03PM
Development and Implementation of an Augmented Reality Introductory Experience for Mechanical Engineering Freshman Students

Technical Paper Publication: IMECE2023-112770
Danae Kay - Texas State University
Zachary Koenig - Texas State University
Karim Muci-Kuchler - Texas State University

Worldwide Lean Learning Factories

Technical Paper Publication: IMECE2023-112983
Gabriela R. Witeck - University of Minho
Anabela C. Alves - University of Minho

Heat Transfer Radiation Coefficient Measurements on Different Shaped Sections of a Piping System

Technical Paper Publication: IMECE2023-109833
Mahmoud Elsharafi - Midwestern State University
Ty Criss - Midwestern State University
Nevil Vora - Midwestern State University
Abdullah Alkathiri - Midwestern State University

An Inexpensive Multidisciplinary Teaching Lab Kit for Remote Dual Enrollment Introductory Engineering Courses

Technical Paper Publication: IMECE2023-111032
Alex Lacerna - University of Florida
Joel Parker - University of Florida
Matthew Traum - University of Florida

It's Curling Night in New Orleans!

Technical Paper Publication: IMECE2023-112436
Eric Stach - Duke University
Genevieve Lipp - Duke University
Pat Mcguire - Duke University
Sophia Santillan - Duke University

Using Low-Cost Hands-On Equipment and Virtual Lab for Teaching and Learning of Mechanical Vibrations

Technical Paper Publication: IMECE2023-112608
Kevin Tran - Kennesaw State University
Britt Walker - Kennesaw State University
Tris Utschig - Kennesaw State University
Ayse Tekes - Kennesaw State University

Electric and Pneumatic Regulation of a Dual Planetary Gearing System Using a Programmable Logic Controller

Technical Paper Publication: IMECE2023-112679
Gillian Achord - Midwestern State University
Kyle Hackett - Midwestern State University
Cahil Burton - Midwestern State University
Salim Azzouz - Midwestern State University
09-11-01: K-12 OUTREACH AND ENGINEERING INNOVATION
10/31/2023
4:00PM–5:45PM – ROOM 272

4:00PM
Young Engineers Summer Camp for K-12 Students: Stem Experiences and Lessons Learned
Technical Presentation: IMECE2023-109837
Pranaya Pokharel - Midwestern State University
Zeki Ilhan - Midwestern State University
Salim Azzouz - Midwestern State University
Sheldon Wang - Midwestern State University
Raj Desai - Midwestern State University
Jan Brink - Midwestern State University
Yu Guo - Midwestern State University
Mahmoud Elsharafi - Midwestern State University

4:21PM
Engineering Terms Into Elementary Matrix Format
Technical Presentation: IMECE2023-112864
Joseph Ufnal - Advanced Power & Energy Corp

5:03PM
Building Inclusive and Just Pathways to a Clean Energy Economy Through Youth Education of Clean Energy
Technical Presentation: IMECE2023-119678
Mark Mueller - The University of Alabama
Hyunjung Ji - The University of Alabama
Sally Shettles - The University of Alabama
Laurel Holmes - Energy Alabama
Hyun Jin Kim - The University of Alabama

5:24PM
Project-Based Cross-Disciplinary Learning Through the NEET (New Engineering Education Transformation) Living Machines Program at MIT
Technical Presentation: IMECE2023-120298
Mohammad Mehdi Salek - Massachusetts Institute of Technology
Babi Mitra - Massachusetts Institute of Technology
Linda Griffith - Massachusetts Institute of Technology

09-12-01: MECHATRONICS, AUTOMATION, ROBOTICS, AND CONTROL ENGINEERING
10/31/2023
4:00PM–5:45PM – ROOM 273

4:00PM
System Identification and Controller Design of Propeller Driven Pendulum (Bi-Copter)
Technical Paper Publication: IMECE2023-109757
Eniko T. Enikov - The University of Arizona
Qiuchen Zhang - The University of Arizona
Lucas Creery - The University of Arizona
4:21PM

Part 2: Gyroscopic Control of Robotic Smart Vehicles Using SE(3)
Technical Paper Publication: IMECE2023-111506
Thorstein Rykkje - Western Norway University of Applied Sciences
Kristian Johnsen - Western Norway University of Applied Sciences
Petter Skjelvik Hole - Western Norway University of Applied Sciences
Joakim Hernar Jacobsen - Western Norway University of Applied Sciences
Dirk Luchtenburg - The Cooper Union
Thomas Impelluso - Western Norway University of Applied Sciences

4:42PM

Interdisciplinary Design and Social Robotics
Technical Paper Publication: IMECE2023-112978
William D. Michael - University of Colorado Colorado Springs
Lynname George - University of Colorado Colorado Springs

5:03PM

Development of an Articulating Robot Arm Kit as an Educational Tool for Middle School Students
Technical Paper Publication: IMECE2023-112999
Ramitha Herath - University of Cincinnati
Kyle Balko - University of Cincinnati
Benjamin Pottmeyer - University of Cincinnati
John-Paul Williams - University of Cincinnati
Janet Dong - University of Cincinnati

5:24PM

Teaching the Reachable and Dexterous Workspace of Articulated Robotic Manipulators Using MATLAB Animation
Technical Paper Publication: IMECE2023-113471
Michael Kutzer - U.S. Naval Academy
Erick Rodriguez-Seda - U.S. Naval Academy
Track 10: Fluids Engineering

Topics:
10-1: Applications of Plasma Flows
10-2: CFD Applications for Optimization and Controls
10-3: DNS, LES, and Hybrid-RANS/LES Methods for CFD
10-4: Fluid Measurements and Instrumentation
10-5: Fundamental Issues and Perspectives in Fluid Mechanics
10-6: Microfluidics 2023 - Fluid Engineering in Micro- and Nanosystems
10-7: Fluid Mechanics and Rheology of Nonlinear Materials and Complex Fluids
10-8: Electric, Magnetic, and Thermal Phenomena in Micro and Nano-Scale Systems
10-9: Multiphase Flows and Applications
10-10: Industrial Flows
10-11: Young Engineer Paper (YEP) Contest Fluids Engineering Division
10-12: Novel Verification, Validation, and Uncertainty Quantification (VVUQ) Techniques and Approaches for Fluids Applications
10-13: Graduate Student Scholar (GSS) Competition
10-14: Flow Visualization Competition Image
10-15: Flow Visualization Competition Videos
10-16: Who's Who Video Competition

ACKNOWLEDGMENT

TRACK ORGANIZERS

Track Organizer: Marianne Francois, Los Alamos National Laboratory
Track Co-Organizer: Ning (Michael) Zhang, McNeese State University

TOPIC ORGANIZERS:

Aarthis Sekaran
Asif Salahuddin, General Motors
Bertrand Rollin, Lawrence Livermore National Laboratory
Boris Khusid, New Jersey Institute of Technology
Charlie Zheng
Daniel Garmann, Air Force Research Laboratory
Deify Law, California State University, Fresno
Dennis Siginer, Universidad de Santiago de Chile
Ernesto Primera, Chevron
Ivaylo Nedyalkov, University of New Hampshire
Jalal Ahamed
Jingsen Ma
Judith Bamberger, Pacific Northwest National Laboratory
Keith Walters, University of Arkansas
Kevin Dowding, Sandia National Laboratories
Leitao Chen, Tennessee State University
M’hamed Boutaous, CETHIL (Centre d’Énergétique et de Thermique de Lyon)
Marianne Francois, Los Alamos National Laboratory
Mehdi Salek, ETH Zurich
Michelle Pagano, ASME
Ning (Michael) Zhang, McNeese State University
Philipp Epple, Coburg University of Applied Sciences
Ravinder Yerram, General Electric
Robert Kunz, Penn State University
S.A. Sherif, University of Florida
Sangjin Ryu, University of Nebraska-Lincoln
Shanti Bhushan, Mississippi State University
Soroor Karimi, The University of Tulsa
Terry Beck
Yang Liu, The City College of New York
SESSION CHAIRS:
Aarthis Sekaran
Asif Salahuddin, General Motors
Bertrand Rollin, Lawrence Livermore National Laboratory
Boris Khusid, New Jersey Institute of Technology
Daniel Garmann, Air Force Research Laboratory
Deify Law, California State University, Fresno
Dennis A. Siginer, Universidad de Santiago de Chile
Ernesto Primera, Chevron
Ivaylo Nedyalkov, University of New Hampshire
Jingsen Ma
Judith Bamberger, Pacific Northwest National Laboratory
M’hamed Boutaous, CETHIL (Centre d’Énergétique et de Thermique de Lyon)
Marianne Francois, Los Alamos National Laboratory
Mohammad Mehdi Salek, ETH Zurich
Mohammed Jalal Ahamed, University of Windsor
Ning (Michael) Zhang, McNeese State University
Philipp Epple, Coburg University of Applied Sciences
Ravinder Yerram, General Electric
Robert Kunz, Penn State University
S.A. Sherif, University of Florida
Sangjin Ryu, University of Nebraska-Lincoln
Shanti Bhushan, Mississippi State University
Soroor Karimi, The University of Tulsa
Yang Liu, The City College of New York
Zhongquan Zheng, Utah State University

TECHNICAL SESSIONS

TRACK 10: FLUIDS ENGINEERING
MONDAY, OCTOBER 30

10-02-01: CFD APPLICATIONS FOR OPTIMIZATION AND CONTROLS
10/30/2023
10:45AM–12:30PM – ROOM 269

10:45AM

CFD-Based Optimization of the Kinematic Cycle of an Oscillating Foil Energy Harvesting Device
Technical Paper Publication: IMECE2023-116713
Nick Rovito - University of Arkansas
D. Keith Walters - University of Arkansas

11:06AM

Computational Fluid Dynamics and Heat Transfer for Maze Solving and Piping Applications
Technical Paper Publication: IMECE2023-110118
Kevin Zhang - Alfred M. Barbe High School
Puxuan Li - Kansas State University

11:27AM

Analytical and Numerical Investigations on the Stator Guide Vanes for Low-Pressure Axial Fans
Technical Paper Publication: IMECE2023-112080
Manuel Fritsche - Coburg University of Applied Sciences
Philipp Epple - Coburg University of Applied Sciences
Antonio Delgado - University Erlangen-Nürnberg

11:48AM

Optimization of Vane-Style Variable Area Flowmeter Calibration Through CFD Analysis
Technical Paper Publication: IMECE2023-112448
Syed Imran - Purdue University Northwest
Shilei Ma - Dwyer Instruments, Inc.
Armin Silaen - Purdue University Northwest
TECHNICAL SESSIONS

Peter Hackett - Dwyer Instruments, Inc.
Nicholas Walla - Purdue University Northwest
Xipeng Guo - Purdue University Northwest
Robert Moss - Dwyer Instruments, Inc.
Chenn Zhou - Purdue University Northwest

12:09PM

Flood Assessment and Modeling

Technical Paper Publication: IMECE2023-112590
Austin Thibodeaux - McNeese State University
Zhulien Monev - McNeese State University
Tabitha Tyler - McNeese State University
Abbie Decoursey - McNeese State University
Ning Zhang - McNeese State University

10:45AM–12:30PM – ROOM 270

10:45AM

Experimental Demonstration of a Novel Elastohydrodynamic Seal Concept for sCO2 Turbomachinery

Technical Paper Publication: IMECE2023-114172
Mohammad Fuad Hassan - Georgia Southern University
Hanping Xu - Ultool, LLC
Mohammad Towhidul Islam - Georgia Southern University
Sevki Cesmeci - Georgia Southern University
Shuangbiao Liu - Ultool, LLC
Aaron Harcrow - Ultool, LLC
Ali Akbar Topu - Georgia Southern University
Md Wasif Hasan - Georgia Southern University
Jonah Henry - Georgia Southern University
Joshua Bunting - Georgia Southern University
David Dewis - Independent Consultant
Jing Tang - Ultool, LLC

11:06AM

Experimental Characterization of a Centrifugal Compressor in Second Quadrant Operation

Technical Paper Publication: IMECE2023-112735
Alberto Serena - Norwegian University of Science and Technology
Lars Eirik Bakken - Norwegian University of Science and Technology

11:27AM

Investigation of Frequency Coupling in a Restricted Pulsatile Flow

Technical Paper Publication: IMECE2023-110625
Alexandra Barbosa Gonzalez - Trinity College
Felix Goldmann - Trinity College
Fadhil Ahmed - Trinity College
Clayton Byers - Trinity College

11:48AM

Spatially Resolved Ion Current Density Measurements With a Transient Insertion Langmuir Probe

Technical Paper Publication: IMECE2023-113535
Christopher Martin - Penn State Altoona
Jacob Orr - Penn State Altoona
S.M. Mahbobur Rahman - Virginia Tech
Alexandrina Untaroiu - Virginia Tech
10-07-01: FLUID MECHANICS AND RHEOLOGY OF NONLINEAR MATERIALS AND COMPLEX FLUIDS
10/30/2023
10:45AM–12:30PM – ROOM 271

10:45AM
Comparing Experimental Results for Large Particle Separation From Non-Newtonian Slurries Using Full and Tapered Bump Arrays

Technical Paper Publication: IMECE2023-110897
Judith Ann Bamberger - Pacific Northwest National Laboratory
Leonard F. Pease - Pacific Northwest National Laboratory
Jason E. Serkowski - Pacific Northwest National Laboratory
Michael J. Minette - Pacific Northwest National Laboratory
Carolyn A. Burns - Pacific Northwest National Laboratory

11:06AM
Effect of Water Cut and Temperature on the Stability of Emulsifier-Free Oil-Water Dispersion in Batch Separators at Various Stirrer Speeds

Technical Paper Publication: IMECE2023-111435
K. Alanazi - The University of Tulsa
R. Mohan - The University of Tulsa
S. S. Kolla - Oklahoma State University
O. Shoham - The University of Tulsa

11:27AM
Prediction of Pressure Distribution in a Magnetorheological Squeeze Film Damper With Short Bearing Approximation Under Slip Conditions

Technical Paper Publication: IMECE2023-112682
Juan. R. Gómez - Instituto Politécnico Nacional, SEPI-ESIME Unidad Azcapotzalco

Juan P. Escandón - Instituto Politécnico Nacional, SEPI-ESIME Unidad Azcapotzalco
René O. Vargas - Instituto Politécnico Nacional, SEPI-ESIME Unidad Azcapotzalco
Edson M. Jimenez - Instituto Politécnico Nacional, SEPI-ESIME Unidad Azcapotzalco

11:48AM
Experimental Study of Monovalent Salt and Hydrochloric Acid Solution Effects on the Stability of Blank Oil-Water Dispersion in Batch Separators

Technical Paper Publication: IMECE2023-112880
K. Alanazi - The University of Tulsa
R. Mohan - The University of Tulsa
S. S. Kolla - Oklahoma State University
O. Shoham - The University of Tulsa

12:09PM
The Limits to Bubble Capture Through Porous Aerophilic Membranes

Technical Presentation: IMECE2023-117082
Bert Vandereydt - Massachusetts Institute of Technology
Saurab Nath - Massachusetts Institute of Technology
Tal Joseph - Massachusetts Institute of Technology
Kripa Varanasi - Massachusetts Institute of Technology
10-02-02: CFD APPLICATIONS FOR OPTIMIZATION AND CONTROLS

10/30/2023
2:00PM–3:45PM – ROOM 269

2:00 PM

Analytical and Numerical Analysis of the De Haller Criterion for Low-Pressure Axial Fans

Technical Paper Publication: IMECE2023-113304
Manuel Fritsche - Coburg University of Applied Sciences
Philipp Epple - Coburg University of Applied Sciences
Antonio Delgado - University Erlangen-Nürnberg

2:21PM

Numerical Methods for Improving the Optimization Efficiency of Textured Surfaces

Technical Paper Publication: IMECE2023-111458
Yu Geng - Xi'an Jiaotong University
Li Chen - Xi'an Jiaotong University
Heng Liu - Xi'an Jiaotong University
Shemiao Qi - Xi'an Jiaotong University
Yi Liu - Xi'an Jiaotong University
Rui Zhou - Xi'an Jiaotong University
Rongfeng Zhang - Xi'an Jiaotong University
Bowen Fan - Xi'an Jiaotong University
Yinsi Chen - Xi'an Jiaotong University
Yuan Li - Xi'an Jiaotong University

3:03PM

Numerical Simulation of Flow Over a Car and the Effects of Rear Airfoil-Shaped Spoiler

Technical Paper Publication: IMECE2023-113102
Xingchuan Ma - Portsmouth Abbey School

3:24PM

Computational Study of Transport Phenomena Within a Poultry Incubator

Technical Paper Publication: IMECE2023-114175
Melvy Fernandes - Mississippi State University
Greg Burgreen - Mississippi State University
Jessica Drewery - Mississippi State University
Shanti Bhushan - Mississippi State University

10-04-02: FLUID MEASUREMENTS AND INSTRUMENTATION

10/30/2023
2:00PM–3:45PM – ROOM 270

2:00PM

Development and Integration of Continuous Load and Position Measurement for Quasi-Steady Flows

Technical Paper Publication: IMECE2023-113814
Quintin J. Cockrell - California Polytechnic State University
Nandeesh Hiremath - California Polytechnic State University
2:21PM

Measurements of Natural Ventilation Within a Model Sports Stadium Using Magnetic Resonance Imaging and Planar Laser Induced Fluorescence

Technical Paper Publication: IMECE2023-112397
Bryn Ellwein - United States Military Academy
Jack Gehl - United States Military Academy
Scott Iliff - United States Military Academy
Pierce Ederle - United States Military Academy
Michael Benson - United States Military Academy
Andrew Banko - United States Military Academy

2:42PM

Non-Linear Measurements of Roughness Effects in Pulsing Restricted Flows

Technical Paper Publication: IMECE2023-113907
Clayton Byers - Trinity College
Sandra Ofori - Trinity College
Lincoln Chapata - Trinity College
Taikang Ning - Trinity College

3:03PM

Studying Reultrasonication Effects on the Suspension Stability of Stored Nanofuels Based on Optical Measurements

Technical Paper Publication: IMECE2023-112467
Rahat Mollick - The University of Iowa
Nitin Nagarkar - The University of Iowa
Ford Loskill - Georgia Institute of Technology
Albert Ratner - The University of Iowa

3:24PM

Factors Affecting the Behavior of a Fixed Quantity Fuel Spill

Technical Paper Publication: IMECE2023-112890
Mehran Islam - Virginia Tech
Juliana Pacheco Duarte - University of Wisconsin-Madison
Brian Lattimer - Virginia Tech

2:00PM

Wall-Modeled Large Eddy Simulation of Flow Past an Ahmed Body With a 25° Slant Angle

Technical Paper Publication: IMECE2023-113847
Salvador Mayoral - California State University, Fullerton
Anthony Massis - California State University, Fullerton

2:21PM

The Hydrodynamic Benefits Achieved Through Lateral Spacing of Schooling Manta Rays

Technical Paper Publication: IMECE2023-115047
Zihao Huang - University of Virginia
Alec Menzer - University of Virginia
Jiacheng Guo - University of Virginia
Haibo Dong - University of Virginia

2:42PM

Grid Convergence Properties of Wall-Modeled Large-Eddy Simulations in the Asymptotic Regime

Technical Paper Publication: IMECE2023-116581
Xiang Yang - The Pennsylvania State University
Mahdi Abkar - Aarhus University

3:03PM

Large-Eddy Simulation of Separated Flows on Unconventionally Coarse Grids

Technical Paper Publication: IMECE2023-116879
Yuanwei Bin - The Pennsylvania State University
George Park - University of Pennsylvania
Yu Lv - Chinese Academy of Sciences
Xiang Yang - The Pennsylvania State University
3:24PM

Investigation of Dynamic Hybrid RANS-LES Turbulence Modeling for CFD Simulation of a Normal Jet in Crossflow

Technical Paper Publication: IMECE2023-117073
Cole Simmonds - University of Arkansas
D. Keith Walters - University of Arkansas
James Leylek - University of Arkansas

10-02-03: CFD APPLICATIONS FOR OPTIMIZATION AND CONTROLS
10/30/2023
4:00PM–5:45PM – ROOM 269

4:00PM

Numerical Investigation of an Ocean Brick System

Technical Paper Publication: IMECE2023-114285
Hari Bollineni - Purdue University Northwest
Xiuling Wang - Purdue University Northwest

4:21PM

Hydrodynamics of Metachronal Rowing at Intermediate Reynolds Numbers

Technical Paper Publication: IMECE2023-112572
Menglong Lei - Villanova University
Zhipeng Lou - Villanova University
Junshi Wang - Princeton University
Haibo Dong - University of Virginia
Chengyu Li - Villanova University

4:42PM

Numerical Investigation of Steady Blowing on Active Drag Reduction of a Truck Model

Technical Paper Publication: IMECE2023-114279
Cheng Zhang - University of West Florida
Haiwen Ge - Zhejiang Lab
Ezzat Bakhoum - University of West Florida

5:03PM

A Three-Dimensional Numerical Investigation of Taylor Cone Jets Instabilities Using VOF Method

Technical Paper Publication: IMECE2023-112763
Silvio Candido - University of Beira Interior
José Carlos Páscoa - University of Beira Interior

5:24PM

Recent Development and Limitations of Laser Patterned Riblet-Structures

Technical Paper Publication: IMECE2023-112075
Konrad Hartung - Jade University of Applied Sciences
Udo Löschner - Hochschule Mittweida, University of Applied Sciences
Stefan Maurerberger - Hochschule Mittweida, University of Applied Sciences
Karsten Oehlert - Jade University of Applied Sciences

4:00PM

Nanobubble-Induced Aggregation of Ultrafine Particles: A Molecular Dynamics Study

Technical Presentation: IMECE2023-119799
Zhi Liang - Missouri University of Science and Technology
Eric Bird - Missouri University of Science and Technology

4:21PM

Effect of Surfactants on Surface Wettability via Measurement of Droplet Contact Angle and Interfacial Tension

Technical Paper Publication: IMECE2023-112217
Kritik Saxena - Louisiana Tech University
Yun Chen - Louisiana Tech University
TECHNICAL SESSIONS

4:42PM
Facilitating Water Droplet Removal From Wind Turbine Blades Using Surface Wettability Gradients
Technical Paper Publication: IMECE2023-112445
Jacob Bertelsen - Miami University
Andrew Sommers - Miami University

5:03PM
Capillary Network for Fluid Access
Technical Paper Publication: IMECE2023-112565
Xuewei Zhang - Villanova University
Sylvie Lorente - Villanova University

5:24PM
Investigating the Impact of Nanoparticles and Nanofluids on the Surface Wettability
Technical Paper Publication: IMECE2023-113129
Negin Bahadori - Louisiana Tech University
Yun Chen - Louisiana Tech University

TUESDAY, OCTOBER 31

10:05-01: 29TH SYMPOSIUM ON FUNDAMENTAL ISSUES AND PERSPECTIVES IN FLUID MECHANICS - I
10/31/2023
10:15AM–12:00PM – ROOM 274

10:15AM
Laminar Drag Reduction in Microchannels With Slippery Polymer Brush Surfaces
Technical Paper Publication: IMECE2023-112638
Jayanta Sutradhar - Michigan State University
Bei Fan - Michigan State University

10:36AM
Investigation of Mixtures of Temperature Fields on Micro-Fin Enhanced Surfaces Using Large Eddy Simulations
Technical Paper Publication: IMECE2023-114040
Puxuan Li - Kansas State University
Hatim Alrifaai - Kansas State University
Steven Eckels - Kansas State University

10:57AM
Computational Study of Kelvin-Helmholtz Instabilities
Technical Paper Publication: IMECE2023-113446
Dehua Feng - North Carolina A&T State University
Frederick Ferguson - North Carolina A&T State University
Yang Gao - North Carolina A&T State University
Xinru Niu - North Carolina A&T State University
11:18AM

Experimental Investigation of Vortex Shedding Patterns Behind Tapered Cylinder Pairs

Technical Paper Publication: IMECE2023-111602
Christopher Barbera - Hofstra University
Matthew Hanson - Hofstra University
John Vaccaro - Hofstra University
David Rooney - Hofstra University

11:39AM

Analysis on Swirl Flows Induced in Origami-Based Spiral Deployable Cylinders

Technical Presentation: IMECE2023-119342
Ryoma Matsuda - Meiji University
Sachiko Ishida - Meiji University

10:08-01: ELECTRIC, MAGNETIC, AND THERMAL PHENOMENA IN MICRO AND NANO-SCALE SYSTEMS
10/31/2023
10:15AM–12:00PM – ROOM 275

10:15AM

Forming Colloidal Crystals in Microgravity

Technical Presentation: IMECE2023-112956
Qian Lei - New Jersey Institute of Technology
Boris Khusid - New Jersey Institute of Technology
Lou Kondic - New Jersey Institute of Technology
Andrew D. Hollingsworth - New York University
Paul Chaikin - New York University
William V. Meyer - Universities Space Research Association
Alton J. Reich - Streamline Automation LLC

10:36AM

A Low-Cost Electrowetting on Dielectric Semi-Continuous Pump for Microfluidic Reconfigurable Devices

Technical Presentation: IMECE2023-112814
Behzad Parsi - Brigham Young University
Daniel Maynes - Brigham Young University
Nathan Crane - Brigham Young University

10:57AM

Computational Fluid Dynamics (CFD) Modeling of Microchannel Filling Applications Utilized in Consumer Electronics Manufacturing

Technical Paper Publication: IMECE2023-112474
Santosh Konangi - Ansys Inc.
Sreenivas Viyyuri - Ansys Inc.
Harish Kanchi - Ansys Inc.

11:18AM

Corona Discharge Mediated Electrocoalescence of Nanoscale Water-in-Oil Emulsions

Technical Presentation: IMECE2023-117087
Simon Rufer - Massachusetts Institute of Technology
Sreedath Panat - Massachusetts Institute of Technology
Vishnu Jayaprakash - Massachusetts Institute of Technology
Kripa Varanasi - Massachusetts Institute of Technology
10-05-02: 29TH SYMPOSIUM ON FUNDAMENTAL ISSUES AND PERSPECTIVES IN FLUID MECHANICS - II
10/31/2023
2:00PM–3:45PM – ROOM 274

2:00PM
Numerical Analysis of Air Curtain Jet Blast Deflector
Technical Paper Publication: IMECE2023-117140
Stuart Fletcher - University of Arkansas
D. Keith Walters - University of Arkansas
James Leylek - University of Arkansas

2:21PM
Reynolds-Averaged Navier-Stokes CFD Simulation of High-Speed Boundary Layers
Technical Paper Publication: IMECE2023-117089
Michael Tullis - University of Arkansas
D. Keith Walters - University of Arkansas

2:42PM
An Additively Manufactured Small Footprint Wind Tunnel for Wall Jet and Particle Scavenging Studies
Technical Paper Publication: IMECE2023-116730
Jiaxuan Wang - The Pennsylvania State University
Abrar Ul Karim - The Pennsylvania State University
Tamy Guimarães - The Pennsylvania State University
Robert Kunz - The Pennsylvania State University

3:03PM
Calibration of the K-ω SST Turbulence Model for Backward Facing Step Problem Using Multi-Objective Optimization
Technical Paper Publication: IMECE2023-115019
Alperen Yıldızeli - Istanbul Technical University
Sertac Cadirci - Istanbul Technical University

3:24PM
Improvement of Standard K-Epsilon Turbulence Model for Round Free Jets by Adjusting Closure Coefficients
Technical Paper Publication: IMECE2023-115131
Cem Turutoglu - Istanbul Technical University
Sertac Cadirci - Istanbul Technical University

10-13-01: GRADUATE STUDENT SCHOLAR (GSS) COMPETITION
10/31/2023
2:00PM–3:45PM – ROOM 275

2:00PM
Investigation of Annular Gas Seal Performance With Combined Cavity Patterns Using Computational Fluid Dynamics
Technical Paper Publication: IMECE2023-112340
Saltuk Yildiz - Virginia Tech
Alexandrina Untaroiu - Virginia Tech

2:21PM
Wake Dynamics of Complex Turning Vanes Using Time-Resolved Particle Image Velocimetry Measurements
Technical Paper Publication: IMECE2023-113379
Andrew Hayden - Virginia Tech
John Gillespie - Virginia Tech
Cole Hefner - Virginia Tech
Todd Lowe - Virginia Tech
Alexandrina Untaroiu - Virginia Tech

2:42PM
The Effects of Balloon Thickness on the Viability of a Microfluidic Cell Compression Device
Technical Paper Publication: IMECE2023-113642
Carson Emeigh - University of Nebraska-Lincoln
Brennan Harms - University of Nebraska-Lincoln
Rose Pineda - University of Nebraska-Lincoln
Sangjin Ryu - University of Nebraska-Lincoln
3:03PM

A Multiphysics Approach to Understanding Chemoreception in Bio-Robotic Fish Schools
Technical Paper Publication: IMECE2023-114543
Alec Menzer - University of Virginia
Menglong Lei - Villanova University
Chengyu Li - Villanova University
Haibo Dong - University of Virginia

3:24PM

Investigation of Active Fluids’ Behavior in a Y-Shaped Microchannel
Technical Paper Publication: IMECE2023-116572
Zahra Samadi - Western University at Ontario
Reza Saifi - Western University at Ontario
Malihe Mehdizadeh Aliaf - Western University at Ontario
Mohammad Hossain - Western University at Ontario
Christopher Thomas Degroot - Western University at Ontario
Hassan Peerhossaini - Western University at Ontario

4:00PM

Flow and Heat Transfer in a Ribbed Converging-Diverging U-Duct Under Rotating and Non-Rotating Conditions
Technical Paper Publication: IMECE2023-112480
Wanjae Kim - Purdue University
Tom Shih - Purdue University
Sung Yong Chang - Korea Electric Power Research Institute
Hae Soo Kang - Korea Electric Power Research Institute
Kenneth Bryden - Iowa State University
Richard Dalton - DOE National Energy Technology Laboratory

5:03PM

Single Phase Study of an Oscillating Electrohydrodynamic Conduction Pump for Enhanced Heat Transfer
Technical Paper Publication: IMECE2023-113079
Alexander J. Castaneda - Worcester Polytechnic Institute

5:24PM

A Water Saving Device for Home Usage
Poster Paper Publication: IMECE2023-113413
Jose Antonio Romero - Queretaro Autonomous University
TECHNICAL SESSIONS

WEDNESDAY, NOVEMBER 1

10-09-01: MULTIPHASE FLOWS AND APPLICATIONS
11/1/2023
10:45AM–12:30PM – ROOM 276

10:45AM

Transpiration of Water in a 100-M Tall Simulated Tree
Technical Presentation: IMECE2023-120206
Sajag Poudel - Syracuse University
An Zou - Syracuse University
Shalabh Maroo - Syracuse University

11:06AM

Flow Characterization of Pure CO$_2$ and Impure CO$_2$ Under Varied Boundary Conditions in Pipes and Wellbores for Carbon Capture, Utilization, and Storage Projects
Technical Presentation: IMECE2023-116565
Muğan Güner - SLB
Yao Wang - SLB

11:27AM

Targeted Particle Fractionation Technologies: Proof of Concept
Technical Paper Publication: IMECE2023-110684
Michael Minette - Pacific Northwest National Laboratory
Carolyn Burns - Pacific Northwest National Laboratory
Nathan Phillips - Pacific Northwest National Laboratory
Casie Davidson - Pacific Northwest National Laboratory
Judith Bamberger - Pacific Northwest National Laboratory
Jason Serkowski - Pacific Northwest National Laboratory
Leonard Pease - Pacific Northwest National Laboratory

11:48AM

A Data-Driven Approach for Predicting the Onset of Entrainment in Two-Fluid Stratified Systems During Selective Withdrawal Process Using Machine Learning Techniques
Technical Paper Publication: IMECE2023-111411
Sabbir Hassan - Texas Tech University
Darryl James - Texas Tech University

12:09PM

Improving Efficiency of Automotive Coating and Curing Processes Through Deep Learning Algorithms and High-Fidelity CFD Modeling
Technical Paper Publication: IMECE2023-112373
Silvio Candido - University of Beira Interior
Mohammad-Reza Pendar - University of Beira Interior
José Carlos Pácoa - University of Beira Interior

10-10-01: INDUSTRIAL FLOWS
11/1/2023
10:45AM–12:30PM – ROOM 277

10:45AM

Determining the Physical Components of Resistance Acting on a Hydrofoil
Technical Paper Publication: IMECE2023-112475
Lev Chernyshev - University of Canterbury
Natalia Kabaliuk - University of Canterbury
Mark Jermy - University of Canterbury
Simon Corkery - Emirates Team New Zealand
Daniel Bernasconi - Emirates Team New Zealand
11:06AM

Energy Efficiency Improvement Through Pumping System Modeling and Analysis

Technical Paper Publication: IMECE2023-113588
Spencer Jones - Tennessee Technological University
Ethan Languri - Tennessee Technological University

11:27AM

Detailed Engineering of the Automation of a Test Bench for Drilling Fluids and Cuttings Transport of Ecopetrol – ICP

Technical Paper Publication: IMECE2023-114156
Julio Cesar Santiago Alvarez - Universidad Autónoma de Bucaramanga
Samuel David Jerez Perez - Universidad Autónoma de Bucaramanga
Sebastian Roa Prada - Universidad Autónoma de Bucaramanga
Gonzalo Andres Moreno Olano - Universidad Autónoma de Bucaramanga
Hernan Dario Mantilla Hernandez - Ecopetrol - ICP
Nestor Fernando Saavedra Trujillo - Ecopetrol - ICP

11:48AM

Systems Level Design and Simulation of a Supercritical Carbon Dioxide Polygon Engine Opposing Piston Expander

Technical Paper Publication: IMECE2023-108862
Frederick Mitri - California State Polytechnic University, Pomona
Kevin Anderson - California State Polytechnic University, Pomona

2:00PM

Effect of Different Inlet Structures on the Separation Efficiency of the Multiphase Flow Cyclone Separator: CFD–DEM Coupling Approach

Technical Presentation: IMECE2023-113236
Mahmoud A. El-Emam - Jiangsu University
Ling Zhou - Jiangsu University

2:21PM

Cavitating Flow in Dielectric Liquids Under Pulsed Electrical Excitation

Technical Presentation: IMECE2023-114236
Younes Tatari - Texas A&M University–Kingsville
Xuewei Zhang - Texas A&M University–Kingsville

2:42PM

Richardson-Zaki Exponents for Particles, Drops, and Bubbles

Technical Paper Publication: IMECE2023-109881
Eric Loth - University of Virginia

3:03PM

Numerical Study of the Friction Coefficient of an Incompressible Laminar Flow With Solid Particles Over a Flat Plate

Technical Paper Publication: IMECE2023-111962
Eliezer J. Gonzalez - Universidad de Oriente
Luis E. Navarrete - Universidad de Oriente
Orlando M. Ayala - Old Dominion University
Orlando F. Ayala - Universidad de Oriente
Manuel Ayala - Johns Hopkins University
3:24PM

Numerical Study of the Velocity Profiles in an Incompressible Laminar Flow With Particles Between Two Parallel Plates

Technical Paper Publication: IMECE2023-113888
Julio C. Marín B. - Universidad de Oriente
Carlos Amaya - Universidad de Oriente
Orlando M. Ayala H. - Old Dominion University
Orlando F. Ayala - Universidad de Oriente
Manuel Ayala - Johns Hopkins University

2:42PM

Computational Study on the Effect of Multiple Inlets in a Vacuum Membrane Distillation Module

Technical Paper Publication: IMECE2023-113048
Justin Caspar - Lehigh University
Guanyang Xue - Lehigh University
Alparslan Oztekin - Lehigh University

3:03PM

Hollow Fiber Vacuum Membrane Distillation Modules With Cross-Flow and Parallel Flow Arrangements

Technical Paper Publication: IMECE2023-113051
Justin Caspar - Lehigh University
Guanyang Xue - Lehigh University
Mohammed Asiri - Lehigh University
Alparslan Oztekin - Lehigh University

2:00PM

Curved Seawalls as an Erosion Management Tool for Saipan

Technical Paper Publication: IMECE2023-110631
Yoshihiro Yagi - University of Washington Tacoma
Yajun An - University of Washington Tacoma
Heather Dillon - University of Washington Tacoma

2:21PM

Virus Transmission Aboard a Transit Bus

Technical Paper Publication: IMECE2023-111308
Jeremy Banifaco - California State University, Long Beach
Hamid Rahal - California State University, Long Beach
Raymond Horstman - California State University, Long Beach

4:00PM

Predicting Drop Dynamics in Sub-Critical Weber Number Regime: High-Fidelity Simulation and Data-Driven Modeling

Technical Paper Publication: IMECE2023-116851
Taofiqhasan Mahmood - Baylor University
Md Amanullah Kabir Tonmoy - University of South Carolina
Chad Sevart - University of South Carolina
Yi Wang - University of South Carolina
Yue Ling - University of South Carolina
4:21PM

An Experimental Study of the Impinging and Freezing Dynamics of Colloidal Droplet on Solid Surfaces

Technical Paper Publication: IMECE2023-112762
Andro Abdelmalek - City College of New York
Xiaoxiao Zhang - City College of New York
Yang Liu - City College of New York

4:42PM

Rime Ice Accretion on an Airfoil Under Different Icing Conditions Using an Eulerian Approach

Technical Paper Publication: IMECE2023-117131
Arash Shad - University of Florida
S.A. Sherif - University of Florida

5:03PM

Simulation and Modeling for the Vaporization of a Freely Moving Drop at Moderate Weber Numbers

Technical Paper Publication: IMECE2023-117231
Bradley Boyd - University of Canterbury
Sid Becker - University of Canterbury
Yue Ling - University of South Carolina

5:24PM

Investigation of Kinetics of Crystallization From a Concentration Controlled Supersaturated Solution in a Two-Phase Microfluidic System

Technical Paper Publication: IMECE2023-114385
Selis Onel - Hacettepe University
Tijani Ahmed Ahmed - Hacettepe University
Anil Hatiboglu - Hacettepe University

10-10-03: INDUSTRIAL FLOWS

4:00PM–5:45PM – ROOM 277

4:00PM

A Numerical Study on Performance Enhancement of Locally Produced Axial-Flow Fans for Grain Drying

Technical Paper Publication: IMECE2023-112059
Ren Paulo Estaquio - University of the Philippines
Louis Angelo Danao - University of the Philippines
Julius Rhoan Lustro - University of the Philippines

4:21PM

Experimental Identification of Reduced Order Model Parameters for Hydrokinetic Energy System Design

Technical Presentation: IMECE2023-113489
Austin Griffin - The University of Memphis
Yong Hoon Lee - The University of Memphis

4:42PM

Improving CFD Simulations by Local Machine-Learned Corrections

Technical Paper Publication: IMECE2023-113724
Peetak Mitra - University of Massachusetts
Majid Haghshenas - University of Massachusetts Amherst
Niccolo Dal Santo - MathWorks
Conor Daly - MathWorks
David Schmidt - University of Massachusetts
### TECHNICAL SESSIONS

**Track 11: Heat Transfer and Thermal Engineering**

<table>
<thead>
<tr>
<th>Topic</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>11-1: Single-Phase Enhanced Heat Transfer Equipment</td>
<td></td>
</tr>
<tr>
<td>11-2: Multi-Scale Multi-Phase Heat Transfer Equipment</td>
<td></td>
</tr>
<tr>
<td>11-3: Heat and Mass Transfer in Porous Media</td>
<td></td>
</tr>
<tr>
<td>11-4: Advanced Heat Exchangers for Decarbonization</td>
<td></td>
</tr>
<tr>
<td>11-5: AI/ML Applications in Combustion Power and Propulsion Systems</td>
<td></td>
</tr>
<tr>
<td>11-6: Emissions Reduction Technologies and Decarbonization</td>
<td></td>
</tr>
<tr>
<td>11-7: Industrial and Applied Combustion Systems</td>
<td></td>
</tr>
<tr>
<td>11-8: Hypersonic Re-entry Heat Transfer Phenomena</td>
<td></td>
</tr>
<tr>
<td>11-9: Fundamentals of Single Phase Convection</td>
<td></td>
</tr>
<tr>
<td>11-10: Thermal Management in Aerospace Applications</td>
<td></td>
</tr>
<tr>
<td>11-11: Endothermic Fuels</td>
<td></td>
</tr>
<tr>
<td>11-12: Advances in Batteries</td>
<td></td>
</tr>
<tr>
<td>11-13: Terrestrial Application of Heat Transfer</td>
<td></td>
</tr>
<tr>
<td>11-14: Machine Learning/AI Applications in Aerospace Heat Transfer</td>
<td></td>
</tr>
<tr>
<td>11-15: Enhancements in Nano/Micro-to-Macroscale Condensation Heat Transfer</td>
<td></td>
</tr>
<tr>
<td>11-16: Passive and Active Two-Phase Cooling: Heat Pipes, Pumped Two-Phase Loops</td>
<td></td>
</tr>
<tr>
<td>11-17: Spray Impingement Heat Transfer for High Heat Flux Dissipation</td>
<td></td>
</tr>
<tr>
<td>11-18: Flow Boiling Studies in Mini- and Microscale Channels</td>
<td></td>
</tr>
<tr>
<td>11-19: Solid/Liquid Phase Change Processes With Applications</td>
<td></td>
</tr>
<tr>
<td>11-20: Gas Turbine Heat Transfer</td>
<td></td>
</tr>
<tr>
<td>11-21: Transport Phenomena in Manufacturing and Materials Processing</td>
<td></td>
</tr>
<tr>
<td>11-22: Transport Phenomena in Additive Manufacturing</td>
<td></td>
</tr>
<tr>
<td>11-23: Processing of Frontier Materials</td>
<td></td>
</tr>
<tr>
<td>11-24: Processing of Energy Materials</td>
<td></td>
</tr>
<tr>
<td>11-25: Heat Transfer in Electronic Equipment</td>
<td></td>
</tr>
<tr>
<td>11-26: Heat and Mass Transfer in Natural and Built Environments</td>
<td></td>
</tr>
<tr>
<td>11-27: Direct Carbon Removal From Ambient</td>
<td></td>
</tr>
<tr>
<td>11-28: Energy Recovery Systems: Fundamental and Applications</td>
<td></td>
</tr>
<tr>
<td>11-29: Inverse Problems in Heat Transfer</td>
<td></td>
</tr>
<tr>
<td>11-30: Computational Heat Transfer – Applications</td>
<td></td>
</tr>
<tr>
<td>11-31: Computational Methods for Materials Development</td>
<td></td>
</tr>
<tr>
<td>11-32: Heat Transfer in Hypersonic Flows</td>
<td></td>
</tr>
<tr>
<td>11-33: Applications of Machine Learning/Artificial Intelligence for Heat Transfer Problems</td>
<td></td>
</tr>
<tr>
<td>11-34: High Performance Computing for Heat Transfer</td>
<td></td>
</tr>
<tr>
<td>11-35: Student Competition Session</td>
<td></td>
</tr>
<tr>
<td>11-36: Photo Gallery for Heat and Mass Transfer</td>
<td></td>
</tr>
<tr>
<td>11-37: Production, Storage, and Transportation of Liquid Hydrogen</td>
<td></td>
</tr>
<tr>
<td>11-38: Ultrahigh Temperature Thermal Energy Recovery and Storage</td>
<td></td>
</tr>
<tr>
<td>11-39: Heat Transfer in Complex Thermochemical Conversion</td>
<td></td>
</tr>
<tr>
<td>11-41: Heat Transfer Optimization Leveraging Additive Manufacturing and Topology Optimization</td>
<td></td>
</tr>
<tr>
<td>11-43: Heat Transfer in Battery Management and Energy Storage Technology</td>
<td></td>
</tr>
<tr>
<td>11-44: Radiative Heat Transfer in Energy System</td>
<td></td>
</tr>
<tr>
<td>11-45: Technique Development for Thermophysical Characterization</td>
<td></td>
</tr>
<tr>
<td>11-46: Thermophysical Properties: From Macro Down to Micro- and Nanoscale</td>
<td></td>
</tr>
<tr>
<td>11-47: Fundamentals of Single-Phase Convection</td>
<td></td>
</tr>
<tr>
<td>11-48: Fundamentals of Thermal Transport in Porous Media</td>
<td></td>
</tr>
<tr>
<td>11-49: Fundamental of Thermal Transport With Applications to Atmospheric Processes</td>
<td></td>
</tr>
<tr>
<td>11-51: Fundamentals of Cryogenic Heat Transfer</td>
<td></td>
</tr>
<tr>
<td>11-52: Fundamentals of Adsorption/Absorption</td>
<td></td>
</tr>
<tr>
<td>11-54: Fundamentals of Machine Learning for</td>
<td></td>
</tr>
</tbody>
</table>
TECHNICAL SESSIONS

Heat Transfer

11-55: Fundamentals of Thermal/Fluid Processes at Reduced Gravity
11-56: Analytical Methods for Fundamental Studies in Thermal and Fluids
11-57: Fundamentals of Boiling/Condensation Including Micro/Nanoscale Effects [Includes Molecular Level Simulation of Phase Change]
11-58: Switchable/Nonlinear Nanoscale Thermal Transport
11-59: First Principles and Molecular Dynamics Simulations of Thermal Transport in Solids
11-60: Simulations of Thermal Transport in Nanostructures and Across Interfaces
11-61: Thermal Transport in Disordered and Complex Systems
11-62: Machine Learning for Thermal Transport
11-63: Dynamic Radiative Heat Control With Tunable Nanostructures
11-64: Radiative Thermal Devices With Nanostructured Emitters and Absorbers
11-65: Near-field Radiative Heat Transfer and Energy Conversion
11-67: Novel Verification, Validation, and Uncertainty Quantification (VVUQ) Techniques and Approaches for Heat Transfer Applications
11-68: Engineering Standards, Guidance, and Approaches for Verification, Validation, and Uncertainty Quantification (VVUQ)
11-69: Panel Session on the use of Verification, Validation, and Uncertainty Quantification (VVUQ) Engineering Standards in Academia, Gov't Laboratories, and Industry
11-70: Conference-Wide Symposium on Additive Manufacturing: Special Session on Additive Manufacturing of Heat Exchangers and Thermal Devices

ACKNOWLEDGMENT

TRACK ORGANIZERS

Track Organizer: Milind A. Jog, University of Cincinnati
Track Co-Organizer: Kevin Dowding, Sandia National Laboratories

TOPIC ORGANIZERS:

Aaron Wemhoff
Alex Rattner, The Pennsylvania State University
Amitabh Narain, Michigan Technological University
An Zou, Syracuse University
Andrey Kuznetsov
Ankur Jain, The University of Texas at Arlington
Arun Muley, Boeing Research and Technology
Ashwani Gupta, University of Maryland
Atul Kohli
Bakhtier Farouk, Drexel University
Bo Zhao
Chanwoo Park, University of Missouri
Darshan Pahinkar
Diana-Andra Borca-Tasciuc
Dion Anton
Ed Kinzel
Elio Merzari
Geoff Wehmeyer, Rice University
George Nelson, The University of Alabama in Huntsville
Hamidreza Najafi, Florida Institute of Technology
Heng Pan
Jihong Ma, University of Vermont
Jingru Benner
John Palmore
John Tencer, Sandia National Laboratories
Jorge Alvarado
Joseph Feser, University of Delaware
Jun Liu, Oakland University
Junjun Wu
Kashif Nawaz, Oak Ridge National Laboratory
Kevin Dowding, Sandia National Laboratories
Konrad Rykaczewski
Leitao Chen, Tennessee State University
Linxiao Zhu, The Pennsylvania State University
<table>
<thead>
<tr>
<th>Liping Wang</th>
<th>Xianglin Lin, Washington University in St. Louis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marc Hodes</td>
<td>Xinwei Wang, Iowa State University</td>
</tr>
<tr>
<td>Marc Polanka</td>
<td>Xiulin Ruan, Purdue University</td>
</tr>
<tr>
<td>Mathieu Francoeur, McGill University</td>
<td>Xueling Wang, Purdue University Northwest</td>
</tr>
<tr>
<td>Michael Pate, Texas A&amp;M University</td>
<td>Yanguang Zhou, The Hongkong University of Science and Technology</td>
</tr>
<tr>
<td>Michelle Pagano, ASME</td>
<td>Yuhao Xu</td>
</tr>
<tr>
<td>Ming Hu</td>
<td>Zhiguo Qu</td>
</tr>
<tr>
<td>Mohamed Abdelhady, University of Calgary</td>
<td>Zhuomin Zhang, Georgia Institute of Technology</td>
</tr>
<tr>
<td>Nehal Jajal</td>
<td></td>
</tr>
<tr>
<td>Nenad Miljkovic, University of Illinois at Urbana-Champaign</td>
<td></td>
</tr>
<tr>
<td>Nesrin Ozalp</td>
<td></td>
</tr>
<tr>
<td>Omid Askari, West Virginia University</td>
<td></td>
</tr>
<tr>
<td>Oronzio Manca, Università degli Studi della Campania</td>
<td></td>
</tr>
<tr>
<td>Prabhakar Marepalli</td>
<td></td>
</tr>
<tr>
<td>Prashant Singh, The University of Tennessee</td>
<td></td>
</tr>
<tr>
<td>Qiang Liao, Chongqing University</td>
<td></td>
</tr>
<tr>
<td>Ravi Annapragada</td>
<td></td>
</tr>
<tr>
<td>Richard Zhang, University of North Texas</td>
<td></td>
</tr>
<tr>
<td>Ridong Wang</td>
<td></td>
</tr>
<tr>
<td>Rydge Mulford, University of Dayton</td>
<td></td>
</tr>
<tr>
<td>Ryo Amano, University of Wisconsin-Milwaukee</td>
<td></td>
</tr>
<tr>
<td>S.A. Sherif, University of Florida</td>
<td></td>
</tr>
<tr>
<td>Sandip Mazumder</td>
<td></td>
</tr>
<tr>
<td>Sandra Boetcher, Embry-Riddle Aeronautical University</td>
<td></td>
</tr>
<tr>
<td>Sang Muk Kwark</td>
<td></td>
</tr>
<tr>
<td>Shima Hajimirza, Stevens Institute of Technology</td>
<td></td>
</tr>
<tr>
<td>Srikanth Rangarajan, Binghamton University</td>
<td></td>
</tr>
<tr>
<td>Stephen Akwaboa, Southern University and A&amp;M College</td>
<td></td>
</tr>
<tr>
<td>Sy-Bor Wen, Texas A&amp;M University</td>
<td></td>
</tr>
<tr>
<td>Tariq Shamim, Northern Illinois University</td>
<td></td>
</tr>
<tr>
<td>Tengfei Luo, University of Notre Dame</td>
<td></td>
</tr>
<tr>
<td>Tianli Feng, The University of Utah</td>
<td></td>
</tr>
<tr>
<td>Tim Fisher</td>
<td></td>
</tr>
<tr>
<td>Ting Wang, The University of New Orleans</td>
<td></td>
</tr>
<tr>
<td>Troy Munro, Brigham Young University</td>
<td></td>
</tr>
<tr>
<td>Van Carey</td>
<td></td>
</tr>
<tr>
<td>Vincent Oliveto</td>
<td></td>
</tr>
<tr>
<td>Vinod Srinivasan, University of Minnesota</td>
<td></td>
</tr>
<tr>
<td>Alexander Rattner, The Pennsylvania State University</td>
<td></td>
</tr>
<tr>
<td>Amitabh Narain, Michigan Technological University</td>
<td></td>
</tr>
<tr>
<td>Andrea Pickel, University of Rochester</td>
<td></td>
</tr>
<tr>
<td>Arun Muley, Boeing Research and Technology</td>
<td></td>
</tr>
<tr>
<td>Ashwani Gupta, University of Maryland</td>
<td></td>
</tr>
<tr>
<td>Chanwoo Park, University of Missouri</td>
<td></td>
</tr>
<tr>
<td>Dion S. Antao, Texas A&amp;M University</td>
<td></td>
</tr>
<tr>
<td>Geoff Wehmeyer, Rice University</td>
<td></td>
</tr>
<tr>
<td>George Nelson, The University of Alabama in Huntsville</td>
<td></td>
</tr>
<tr>
<td>Hamidreza Najafi, Florida Institute of Technology</td>
<td></td>
</tr>
<tr>
<td>Jihong Ma, University of Vermont</td>
<td></td>
</tr>
<tr>
<td>John Tencer, Sandia National Laboratories</td>
<td></td>
</tr>
<tr>
<td>Joseph Feser, University of Delaware</td>
<td></td>
</tr>
<tr>
<td>Kashif Nawaz, Oak Ridge National Laboratory</td>
<td></td>
</tr>
<tr>
<td>Kevin Dowding, Sandia National Laboratories</td>
<td></td>
</tr>
<tr>
<td>Michael Pate, Texas A&amp;M University</td>
<td></td>
</tr>
<tr>
<td>Michelle Pagano, ASME</td>
<td></td>
</tr>
<tr>
<td>Milind Jog, University of Cincinnati</td>
<td></td>
</tr>
<tr>
<td>Mohamed Abdelhady, University of Calgary</td>
<td></td>
</tr>
<tr>
<td>Mohammad Ghashami, University of Nebraska-Lincoln</td>
<td></td>
</tr>
<tr>
<td>Omid Askari, West Virginia University</td>
<td></td>
</tr>
<tr>
<td>Oronzio Manca, Università degli Studi della Campania</td>
<td></td>
</tr>
<tr>
<td>Prashant Singh, The University of Tennessee</td>
<td></td>
</tr>
<tr>
<td>Rydge Mulford, University of Dayton</td>
<td></td>
</tr>
<tr>
<td>Ryo Amano, University of Wisconsin-Milwaukee</td>
<td></td>
</tr>
<tr>
<td>S.A. Sherif, University of Florida</td>
<td></td>
</tr>
<tr>
<td>Sang Muk Kwark</td>
<td></td>
</tr>
</tbody>
</table>
TECHNICAL SESSIONS

Shankar Narayanan, Rensselaer Polytechnic Institute
Srikanth Rangarajan, Binghamton University
Srinath V. Ekkad, North Carolina State University
Stephen Akwaboa, Southern University and A&M College
Sy-Bor Wen, Texas A&M University
Tariq Shamim, Northern Illinois University
Tengfei Luo, University of Notre Dame
Tianli Feng, The University of Utah
Ting Wang, The University of New Orleans
Troy Munro, Brigham Young University
Vaibhav Bahadur, The University of Texas at Austin
Vinod Srinivasan, University of Minnesota
Wyatt Hodges, Sandia National Laboratory
Xianglin Li, Washington University in St. Louis
Xinwei Wang, Iowa State University
Xiulin Ruan, Purdue University
Xiuling Wang, Purdue University Northwest
Yi Zheng, Northeastern University
Zhuomin Zhang, Georgia Institute of Technology

TRACK 11: HEAT TRANSFER AND THERMAL ENGINEERING
MONDAY, OCTOBER 30

11-43-01: HEAT TRANSFER IN BATTERY MANAGEMENT AND ENERGY STORAGE TECHNOLOGY
10/30/2023
10:45AM–12:30PM – ROOM 272

10:45AM
Modeling Heat and Mass Transfer in Metal Hydride-Based Hydrogen Storage Systems Using the Finite Volume Method
Technical Paper Publication: IMECE2023-112874
Muhammad Hasnain - Georgia Southern University
Shehzad Khan - Georgia Southern University
M. Amin Ezazi - Georgia Southern University
Hayri Sezer - Georgia Southern University

11:06AM
Modeling Thermal Runaway in Prismatic Lithium-Ion Batteries
Technical Paper Publication: IMECE2023-113787
Shehzad Khan - Georgia Southern University
Sohail Anwar - Georgia Southern University
Jairo Casa - Georgia Southern University
Muhammad Hasnain - Georgia Southern University
Hossain Ahmed - Georgia Southern University
Hayri Sezer - Georgia Southern University

11:27AM
A System-Level Comparison of Active Battery Thermal Management Systems in Electric Vehicles
Technical Presentation: IMECE2023-120193
Samuel Tillma - North Dakota State University
Adam C. Gladen - North Dakota State University
TECHNICAL SESSIONS

11:48AM

Thermal Management System for Lithium-Ion Batteries Using Phase Change Material, Heat Pipes, and Fins

Technical Paper Publication: IMECE2023-113854
Nourouddin Sharifi - Tarleton State University
Dylan Roesler - Tarleton State University
Audrey Gold - Tarleton State University
Hamidreza Shabgard - The University of Oklahoma

11:06AM

Structured Illumination With Infrared Thermometry for Thermal Property Characterization

Technical Presentation: IMECE2023-119791
Ashwath Bhat - University of California, Berkeley
Chris Dames - University of California, Berkeley

11:27AM

Rapid Cross-Plane Thermal Conductivity Characterization From Data Automation and System Miniaturization

Technical Paper Publication: IMECE2023-11923
Matthew Nakamura - University of Hawaii at Manoa
Kailer Okura - University of Hawaii at Manoa
Andrea Murillo - University of Hawaii at Manoa
Joseph Brown - University of Hawaii at Manoa

11:48AM

Developing a Low-Cost Instrumented Heat Transfer Apparatus for Measuring Thermal Conductivity Using Steady-State Methods

Technical Paper Publication: IMECE2023-114015
Brandon Bunt - The Cooper Union
Kamau Wright - The Cooper Union
Benjamin Davis - The Cooper Union

12:09PM

Developing a Floating Calorimeter for in Situ Study of Microbial Activities Near Coral Reefs

Technical Paper Publication: IMECE2023-111701
Yuwei Zhang - Northeastern University
Gregory Kowalski - Northeastern University
### 11-07-01: Industrial and Applied Combustion Systems

**10/30/2023**

**2:00PM–3:45PM – ROOM 271**

**2:00PM**

**Two Color Pyrometry of Combustion for Colloidal Droplets of Carbon-Based Nanoparticles in Water-in-Oil Emulsions**

Technical Presentation: IMECE2023-118620

Mohsen Ghamari - Wilkes University

**2:21PM**

**Heat Transfer and Combustion Processes in the OSU Calorimeter for Rate of Heat Release Predictions**

Technical Paper Publication: IMECE2023-113674

Garrett Cappello - Drexel University

Bakhtier Farouk - Drexel University

**2:42PM**

**Investigation of High-Pressure Laminar Flame Speed Measurement**

Technical Paper Publication: IMECE2023-113441

James Shaffer - West Virginia University

Luis F. Alvarez - West Virginia University

Omid Askari - West Virginia University

**3:03PM**

**Combined Effect of Hydrogen-Enrichment and Stratification on the Stability and Structure of Premixed Swirl-Stabilized CH4/Air Flames**

Technical Paper Publication: IMECE2023-113230

Ahmed Abdelhalim - King Fahd University of Petroleum and Minerals

Ahmed Abdelhafiz - King Fahd University of Petroleum and Minerals

Medhat Nemitallah - King Fahd University of Petroleum and Minerals

### 11-26-01: Heat and Mass Transfer in the Natural and Built Environments

**10/30/2023**

**2:00PM–3:45PM – ROOM 272**

**2:00PM**

**Thermal Performance of Dovetail Fins Under Dehumidifying Operating Conditions: Analytical and Numerical Solutions**

Technical Paper Publication: IMECE2023-113201

Pornphiphat Saiboonchan - Texas A&M University Texarkana

Sulaman Pashah - Texas A&M University Texarkana

**2:21PM**

**Investigation of the Urban Microclimate Variations Based on the Measured Weather Data: A Case Study of Education City and Lusail City of Qatar**

Technical Paper Publication: IMECE2023-112927

Nahin Kabir - Texas A&M University at Qatar

Habiba Abdelhafez - Texas A&M University at Qatar

Nurettin Sezer - Texas A&M University at Qatar

Ibrahim Galal Hassan - Texas A&M University at Qatar

Liangzhu (Leon) Wang - Concordia University

Mohammad Azizur Rahman - Texas A&M University at Qatar

**2:42PM**

**Assessment of the Thermal Comfort and CO2 Distribution Within a Movie Theatre**

Technical Paper Publication: IMECE2023-113930

Ana Carolina Dias Da Costa - University of Minho

Nelson Rodrigues - University of Minho

Ana Marta Carneiro - University of Minho

Inês Teixeira - University of Minho

Lúcio Manuel Machado - University of Minho

Ana Cristina Ferreira - University of Minho

José Carlos Teixeira - University of Minho

Senhorinha Teixeira - University of Minho
3:03 PM

**A Study on the Moisture Barrier Performance of a Multilayer Polymeric Medical Packaging System**

Technical Paper Publication: IMECE2023-112197  
Salih Yildiz - Edwards Lifesciences  
Amrut Biswal - Edwards Lifesciences  
Arti Roth - Edwards Lifesciences  
Sakya Tripathy - Edwards Lifesciences  
Vipul Rajpara - Edwards Lifesciences  
Sam Upadhyaya - Edwards Lifesciences

---

3:24 PM

**Experimental Investigation of Radiative Cooling Potential in Mediterranean Basin Countries**

Technical Paper Publication: IMECE2023-113012  
Mohamed Farahat - Menofia University  
Shahd Elnaggar - Cortex Innovations  
Ahmad Kader - Alexandria University  
Shehab Ahmed - King Abdullah University of Science and Technology  
Muhammad Rashad - Alexandria University

---

**11-46-01: THERMOPHYSICAL PROPERTIES: FROM MACRO DOWN TO MICRO- AND NANOSCALE**

10/30/2023  
2:00 PM–3:45 PM – ROOM 273

2:00 PM

**Thermal Transport in GeTe PCM Based Reconfigurable Devices**

Technical Presentation: IMECE2023-119847  
Zexiao Wang - Carnegie Mellon University  
Xiu Liu - Carnegie Mellon University  
Hyeonggyun Kim - Carnegie Mellon University  
Sheng Shen - Carnegie Mellon University

---

2:21 PM

**Investigation of Nanofin Effect (nFE) for Investigating the Anomalous Properties of Nanofluids**

Technical Paper Publication: IMECE2023-117221  
Ritwik Bhattacharya - Texas A&M University  
Nandan Shettigar - Texas A&M University  
Ashok Thyagarajan - Texas A&M University  
Shahin Shafiee - Prairie View A&M University  
Debjyoti Banerjee - Texas A&M University

---

2:42 PM

**Characterization of Functionalized Nanodiamonds in Mineral Oils for Transformer Applications**

Technical Paper Publication: IMECE2023-113527  
Patrick Swiecichowski - Tennessee Technological University  
Miles Nevills - Tennessee Technological University  
Ethan Languri - Tennessee Technological University  
Jim Davidson - FemtoSci  
Lino Costa - University of Tennessee Space Institute  
David Kerns - FemtoSci

---

3:03 PM

**Thermal Characterization of Functionalized Nanodiamond Enhanced Phase Change Materials for Fast Response to Demand**

Technical Paper Publication: IMECE2023-113540  
Jared Oliver - Tennessee Technological University  
Ethan Languri - Tennessee Technological University  
Jim Davidson - FemtoSci  
Lino Costa - University of Tennessee Space Institute  
David Kerns - FemtoSci
3:24PM

Controlling Thermal Conductivity of Composite Material: Few Large and Many Small Approach

Technical Paper Publication: IMECE2023-112595
Meghana Athadkar - Villanova University
Sylvie Lorente - Villanova University

11-07-02: INDUSTRIAL AND APPLIED COMBUSTION SYSTEMS
10/30/2023
4:00PM–5:45PM – ROOM 271

4:00PM

Investigation of NH$_3$/Air Laminar Burning Speed and Flame Structure at High Pressures

Technical Paper Publication: IMECE2023-112269
Luis Alvarez - West Virginia University
James Shaffer - West Virginia University
Cosmin Dumitrescu - West Virginia University
Omid Askari - West Virginia University

4:21PM

Open-Source Heat Release Model for Internal Combustion Engines

Technical Presentation: IMECE2023-110803
Christopher Depcik - The University of Kansas

4:42PM

Thermal Behaviour of HYPROB DEMO-0A Oxygen/Methane Rocket Engine Demonstrator

Technical Paper Publication: IMECE2023-111867
Daniele Ricci - Centro Italiano Ricerche Aerospaziali
Francesco Battista - Centro Italiano Ricerche Aerospaziali
Manrico Fragiacomo - Centro Italiano Ricerche Aerospaziali
Michele Ferraiuolo - Centro Italiano Ricerche Aerospaziali

5:03PM

Modeling and Implementation of a Flamelet Based Model With Presumed Shaped Probability Distribution Function Integration in Fortran for Non-Premixed Flame Dynamics

Technical Paper Publication: IMECE2023-113566
Md Kamrul Hasan - Virginia Military Institute
Md Azazul Haque - Idaho State University
Rajib Mahamud - Idaho State University

5:24PM

Characterizing Drop-Wall Interactions of Engine Fuels at Engine-Relevant Conditions Using Smoothed Particle Hydrodynamics

Technical Paper Publication: IMECE2023-113917
Mohammad Fahim Faisal Patwary - Texas Tech University
Doruk Isik - Texas Tech University
Song-Charng Kong - Texas Tech University
Eric Mayhew - DEVCOM Army Research Laboratory Aberdeen Proving Ground
Kenneth S. Kim - DEVCOM Army Research Laboratory Aberdeen Proving Ground
Chol-Bum Mike Kweon - DEVCOM Army Research Laboratory Aberdeen Proving Ground
11-42-01: HEAT AND MASS TRANSFER IN HEATING, COOLING, AND POWER SYSTEMS
10/30/2023
4:00PM–5:45PM – ROOM 272

4:00PM
A Novel Solar Absorption Cogeneration System With an Adjustable Cooling-to-Power Ratio
Technical Paper Publication: IMECE2023-117128
Abdulmajeed M. Alghamdi - University of Florida
S.A. Sherif - University of Florida

4:21PM
Experimental Analysis of the Effect of Fluidic Oscillator Geometry on Heat Transfer Performance
Technical Paper Publication: IMECE2023-113638
Rita C.S. Gomes - University of Minho
Flavia V. Barbosa - University of Minho
Erany Constantino - University of Minho
Senhorinha C.F. Teixeira - University of Minho
José C.F. Teixeira - University of Minho

4:42 PM
Atmospheric Water Capture Potential in Arid Countries: An Experimental Investigation
Technical Paper Publication: IMECE2023-113015
Muhammad I. Rashad - Alexandria University
Nada Mourad - Alexandria University
Abdallah Mubarak - Alexandria University
Hend Faiad - Alexandria University
Shehab Ahmed - King Abdullah University of Science and Technology
Mohamed Farahat - Menofia University

5:03PM
Performance of a Forward Feed Multi-Effect (MED-FF) Thermal Desalination System With Feed Preheating
Technical Paper Publication: IMECE2023-113754
Azeez Qudah - King Fahd University of Petroleum and Minerals
Abdulsalam Hasan - King Fahd University of Petroleum and Minerals
Mohamed A. Antar - King Fahd University of Petroleum and Minerals

5:24PM
Static Conversion of a Salinity Difference Into a Temperature Difference: A Heat and Mass Transfer Investigation
Technical Presentation: IMECE2023-119316
Matteo Morciano - Politecnico di Torino
Matteo Fasano - Politecnico di Torino
Pietro Asinari - Politecnico di Torino
Eliodoro Chiavazzo - Politecnico di Torino

11-54-01: FUNDAMENTALS OF PHONONS, ELECTRONS AND THE TRANSPORT PROPERTIES
10/30/2023
4:00PM–5:45PM – ROOM 273

4:00PM
Surface Phonon Polariton-Mediated Heat Conduction in Silicon Carbide Nanowires
Technical Presentation: IMECE2023-120204
Zhiliang Pan - Vanderbilt University
Guanyu Lu - Vanderbilt University
Xun Li - Oak Ridge National Laboratory
Joshua Caldwell - Vanderbilt University
Lucas Lindsay - Oak Ridge National Laboratory
Deyu Li - Vanderbilt University
TECHNICAL SESSIONS

4:21PM
Thermal Transport Simulations of Lanthanum Zirconate at High Temperature
Technical Presentation: IMECE2023-116741
Hao Zhou - The University of Utah
Tianli Feng - The University of Utah

4:42PM
Thermal Transport Properties of Bilayer Graphene With Different Twist Angles
Technical Presentation: IMECE2023-114286
Yingtao Wang - Stevens Institute of Technology
Xian Zhang - Stevens Institute of Technology

5:03PM
Remarkable Effects of Inhomogeneous Strain on Thermal Transport
Technical Presentation: IMECE2023-112209
Lin Yang - Peking University
Yi Tao - Southeast University
Shengying Yue – Xi’an Jiaotong University
Yunfei Chen - Southeast University
Deyu Li - Vanderbilt University

5:24PM
Investigation of Temperature-Driven Knudsen Forces
Technical Presentation: IMECE2023-120131
Greg Acosta - University of Nebraska-Lincoln
Mohammad Ghashami - University of Nebraska-Lincoln

TUESDAY, OCTOBER 31

11:32-01: HEAT TRANSFER IN HYPERSONIC FLOWS
10/31/2023
10:15AM–12:00PM – ROOM 276

10:15AM
Integrated Multi-Mode, Multi-Phase Cooling of High-Speed Leading-Edge Surfaces
Technical Presentation: IMECE2023-117115
David B. Brown - University of California, Los Angeles
Timothy S. Fisher - University of California, Los Angeles

10:36AM
A Particle-in-Cell Model of Thermionic Cooling and Heat Spreading at a Hypersonic Leading Edge
Technical Presentation: IMECE2023-116910
Indronil Ghosh - University of California, Los Angeles
Timothy Fisher - University of California, Los Angeles

10:57AM
Heat Spreading by Thermionic Electron Emission From Sharp Leading Edge Surfaces
Technical Presentation: IMECE2023-117189
David Brown - University of California, Los Angeles
Indronil Ghosh - University of California, Los Angeles
Bryce Boyer - University of California, Los Angeles
Timothy Fisher - University of California, Los Angeles

11:18AM
Temperature Field Around a Space Vehicle Descending in Mars Atmosphere
Technical Paper Publication: IMECE2023-112724
Fahad Nizam Rhisat - Southern Illinois University Edwardsville
Majid Molki - Southern Illinois University Edwardsville
11:39AM

An Axisymmetric Computation of Thermal Field Around an Entry Vehicle Descending in the Martian Atmosphere

Technical Paper Publication: IMECE2023-111310
Fahad Nizam Rhisat - Southern Illinois University Edwardsville
Majid Molki - Southern Illinois University Edwardsville

11-47-01: PHASE CHANGE HEAT TRANSFER
10/31/2023
10:15AM–12:00PM – ROOM 277

10:15AM

Depleted Liquid Infused Surface With Dropwise Condensation Under Ambient Conditions

Technical Presentation: IMECE2023-120214
Durgesh Ranjan - Syracuse University
Maheswar Chaudhary - Syracuse University
An Zou - Syracuse University
Shalabh Maroo - Syracuse University

10:36AM

Development of Modified Perturbation Solutions to the One-Phase Stefan Problems With a Convective Boundary

Technical Paper Publication: IMECE2023-112575
Minghan Xu - McGill University
Mohammaderfan Mohit - McGill University
Saad Akhtar - National Renewable Energy Laboratory
Agus Sasmito - McGill University

10:57AM

Mechanistic Insight Into Micro-Structural Evolution of Porous Hygroscopic Hydrogels via Micro-CT

Technical Presentation: IMECE2023-120248
Joseph Phelim Mooney - Massachusetts Institute of Technology & University of Limerick
Carlos Díaz Marín - Massachusetts Institute of Technology
Gang Chen - Massachusetts Institute of Technology
Jeff Punch - University of Limerick
Vanessa Egan - University of Limerick

11:18AM

High-Performance and Wide Relative Humidity Passive Evaporative Cooling Utilizing Atmospheric Water

Technical Presentation: IMECE2023-120088
Guang Wang - The Hongkong University of Science and Technology
Yang Li - The Hongkong University of Science and Technology
Huihe Qiu - The Hongkong University of Science and Technology
He Yan - The Hongkong University of Science and Technology
Yanguang Zhou - The Hongkong University of Science and Technology

11:39AM

Achieving Durable Superhydrophobic Solar-Thermal Anti-Frosting by Controlling Frost Formation

Technical Presentation: IMECE2023-119641
Wei Ma - The Hong Kong University of Science and Technology
Shuhuai Yao - The Hong Kong University of Science and Technology
11-16-02: OSCILLATING HEAT PIPES AND THERMOSIPHONS
10/31/2023
2:00PM–3:45PM – ROOM 276

2:00PM

Thermal Analysis of Thermosyphon for Waste Heat Recovery From Auto Exhaust Using Limited Fluid Charge

Technical Paper Publication: IMECE2023-109452
Bin Xiao - Texas State University

2:21PM

Theoretical Study of Counter-Current Liquid-Vapor Flow Under Condensation Conditions Over Non-Isothermal Vertical Wall of Two-Phase Closed Thermosyphon

Technical Paper Publication: IMECE2023-112692
Mohammad Zolfagharras - McGill University
Minghan Xu - McGill University
Ahmad Zueter - Dalhousie University
Agus Sasmito - McGill University

2:42PM

An Experimental Investigation of the Relationship Between Evaporator and Condenser Sizes With Oscillating Heat Pipe Start-Up

Technical Paper Publication: IMECE2023-112416
Spencer Miesner - California State University, Los Angeles
Neyda Bautista - California State University, Los Angeles
Kieran Wolk - University of California, Los Angeles
Ben Furst - Jet Propulsion Laboratory
Takuro Daimaru - Jet Propulsion Laboratory
Eric Sunada - Jet Propulsion Laboratory
Scott Roberts - Jet Propulsion Laboratory
John Bellardo - California Polytechnic State University, San Luis Obispo
Jim Kuo - California State University, Los Angeles

3:03PM

Thermal Orbital Spacecraft Analysis of an Additively Manufactured Deployable Radiator Oscillating Heat Pipes (AMDOHP) CubeSat

Technical Paper Publication: IMECE2023-114220
Spencer Miesner - California State University, Los Angeles
Gabriela Shibata - California State University, Los Angeles
Neyda Bautista - California State University, Los Angeles
Kieran Wolk - University of California, Los Angeles
Ben Furst - Jet Propulsion Laboratory
Takuro Daimaru - Jet Propulsion Laboratory
Eric Sunada - Jet Propulsion Laboratory
Scott Roberts - Jet Propulsion Laboratory
John Bellardo - California Polytechnic State University, San Luis Obispo
Jim Kuo - California State University, Los Angeles

3:24PM

Thermal Testing of an AMDROHP (Additively Manufactured Deployable Radiator Oscillating Heat Pipes) for Use in High-Powered CubeSats

Technical Paper Publication: IMECE2023-114249
Spencer Miesner - California State University, Los Angeles
Kieran Wolk - University of California, Los Angeles
Ben Furst - Jet Propulsion Laboratory
Takuro Daimaru - Jet Propulsion Laboratory
Eric Sunada - Jet Propulsion Laboratory
Scott Roberts - Jet Propulsion Laboratory
John Bellardo - California Polytechnic State University, San Luis Obispo
Jim Kuo - California State University, Los Angeles
TECHNICAL SESSIONS

11-57-01: FUNDAMENTALS OF BOILING/CONDENSATION INCLUDING MICRO/NANO-SCALE EFFECTS
10/31/2023
2:00PM–3:45PM – ROOM 277

2:00PM

Coarsening Droplets Delay Frost Formation
Technical Presentation: IMECE2023-120327
Jyotirmoly Sarma - The University of Texas at Dallas
Deepak Monga - The University of Texas at Dallas
Zongqi Guo - The University of Texas at Dallas
Fangying Chen - The University of Texas at Dallas
Xianming Dai - The University of Texas at Dallas

2:21PM

Thermal and Mass Transfer Resistance at a Liquid-Gas Interface of an Evaporating Droplet: A Molecular Dynamics Study
Technical Presentation: IMECE2023-119798
Zhi Liang - Missouri University of Science and Technology
Eric Bird - Missouri University of Science and Technology

2:42PM

Experimental Investigation of the Nano-Fin Effect (nFE) During Thin Film Evaporation From Nanopores Using Temperature Nano-Sensors
Technical Paper Publication: IMECE2023-117183
Juliet Shafer - Texas A&M University
Jonghyun Lee - Texas A&M University
Debjyoti Banerjee - Texas A&M University

3:03PM

Collaborative Mechanisms Boost the Nanoscale Boiling Heat Transfer at Functionalized Gold Surfaces
Technical Presentation: IMECE2023-119972
Yixin Xu - The Hong Kong University of Science and Technology
Yanguang Zhou - The Hong Kong University of Science and Technology

3:24PM

Prediction of Critical Heat Flux in Tube Bundles With Crossflow
Technical Paper Publication: IMECE2023-110005
Mirza Mohammed Shah - Engineering Research Associates
**11-20-01: GAS TURBINE AND ENHANCED HEAT TRANSFER**

**10/31/2023**

**4:00PM–5:45PM – ROOM 276**

---

**4:00PM**

**Numerical Investigation of Broken V-Ribbed Turbulators in a Multi-Pass Turbine Channel Under Rotating Conditions**

Technical Paper Publication: IMECE2023-113885

Madhusudan Pallikaranai Thirumalai - North Carolina State University

Srinath Ekkad - North Carolina State University

---

**4:21PM**

**Combustor Wall Heat Transfer and Emission Characteristics of Premixed Ammonia/Methane/Air Blends in a Swirl Stabilized Gas Turbine Combustor**

Technical Paper Publication: IMECE2023-112466

Meghna Das Chaudhury - North Carolina State University

Abinash Sahoo - North Carolina State University

Srinath V. Ekkad - North Carolina State University

Venkateswaran Narayanaswamy - North Carolina State University

---

**4:42PM**

**Computational Analysis of Heat Recovery From Simple Cycle Gas Turbine Exhaust Stacks Through the Silencer Semi-Circular Sections**

Technical Paper Publication: IMECE2023-112921

Bouria Faqih - Heriot Watt University

Fadi Ghaith - Heriot Watt University

---

**5:03PM**

**Turbulent Heat Transfer From an Isothermal Half-Cylinder Positioned Parallel to Airflow**

Technical Paper Publication: IMECE2023-110279

Nathan A. Rarick - Southern Illinois University Edwardsville

Majid Molki - Southern Illinois University Edwardsville
5:24PM

Forced Convection Enhancement by a Two Stage EHD Gas Pump With an Emitting Electrode Installed on Each Walls

Technical Presentation: IMECE2023-113206
A.K.M. Monayem Mazumder - Saginaw Valley State University

11:02-01: multi-scale multi-phase heat transfer equipment
10/31/2023
4:00PM–5:45PM – ROOM 277

4:00PM

Hydrocarbon Condensation Heat Transfer Enhancement Using Silica Nanosprings and Slippery Liquid-Infused Porous Surfaces (SLIPS)

Technical Paper Publication: IMECE2023-112473
Adam Vuth - Miami University
Andrew Dillman - Miami University
Daniel Conway - Miami University
Joseph Chamberlin - Miami University
Giancarlo Corti - Miami University
Andrew Sommers - Miami University

4:21PM

Pool Boiling of Silicon With Multi-Length Scale Surface Structures

Technical Presentation: IMECE2023-120308
Fabian Medina - The University of Arizona
Qiyu Chen - The University of Arizona

4:42PM

Naturally-Circulated Waste Heat Recovery Equipment Driven by Flue Gas Dumped at a Stack and Performance Improvement

Technical Paper Publication: IMECE2023-111560
Jaedal Lee - Research Institute of Industrial Science and Technology
Junseok Yi - Research Institute of Industrial Science and Technology
Seongkuk Cho - Hyundai Engineering
Sooahwan Jeon - Research Institute of Industrial Science and Technology

5:03PM

Analysis of an Indirect Evaporative Cooling System With Mist Generation

Technical Presentation: IMECE2023-111033
Younggil Park - Florida Polytechnic University

5:24PM

Prediction of Heat Transfer During Condensation of Superheated Vapor Flowing Inside Channels

Technical Paper Publication: IMECE2023-110451
Mirza Mohammed Shah - Engineering Research Associates
WEDNESDAY, NOVEMBER 1

11-62-01: MACHINE LEARNING FOR THERMAL TRANSPORT
11/1/2023
10:45AM–12:30PM – ROOM 278

10:45AM

Physics-Informed Neural Networks for Solving Phonon Boltzmann Transport Equation

Technical Presentation: IMECE2023-119539
Tengfei Luo - University of Notre Dame
Jiahang Zhou - University of Notre Dame
Ruiyang Li - University of Notre Dame

11:06AM

Artificial Neural Networks as the Solution of Non-Linear Inverse Heat Conduction Problems

Technical Presentation: IMECE2023-120331
Hamidreza Najafi - Florida Institute of Technology

11:27AM

Enhanced Chaotic Transition Prediction Using Hierarchical Clustering for the Lorenz System

Technical Paper Publication: IMECE2023-112433
Sofiz Seyed Monir - University of Washington Tacoma
Juhua Hu - University of Washington Tacoma
Ben Tribelhorn - University of Portland
Heather Dillon - University of Washington Tacoma

11:48AM

Exploring Efficacy of Machine Learning (Artificial Neural Networks) for Enhancing Reliability and Resilience of Thermal Energy Storage Platforms Utilizing Phase Change Materials for Sustainability and Mitigating Food-Energy-Water (FEW) Nexus

Technical Paper Publication: IMECE2023-117109
Pinjala Sai Sudhir - Texas A&M University

Debijyoti Banerjee - Texas A&M University
12:09PM

A Fully-Dense Deep Neural Network Method for the Inverse Transient Heat Transfer Problem

Technical Paper Publication: IMECE2023-114272
Adib Bazgir - University of Missouri
Yuwen Zhang - University of Missouri

11-01-01: SINGLE-PHASE ENHANCED HEAT TRANSFER EQUIPMENT
11/1/2023
2:00PM–3:45PM – ROOM 278

2:00PM

Enhanced Forced Convection in Perforated Wavy Plate-Fin Cores

Technical Presentation: IMECE2023-119492
Shubham Sathe - University of Cincinnati
Mahima Kaushik - University of Cincinnati
Milind A. Jog - University of Cincinnati
Raj M. Manglik - University of Cincinnati

2:21PM

Air-Aluminum Foam Applications for Cooling Systems With Heat Generation

Technical Paper Publication: IMECE2023-117196
Gerardo Carbajal - Florida Polytechnic University
Comparative Analysis of Thermal and Hydraulic Performance of a Mini-Channel Heat Sink With Supercritical Carbon Dioxide and Water Coolants

Technical Paper Publication: IMECE2023-113484
Yamin Mansur - Bangladesh University of Engineering and Technology
Md. Ahosan Habib - Bangladesh University of Engineering and Technology
Titan Paul - University of South Carolina Aiken
Akm M. Morshed - Bangladesh University of Engineering and Technology

Louver Fin Design for Condensate Management in Dehumidifying Heat Exchangers

Technical Paper Publication: IMECE2023-110927
Alan Jones - The University of Texas Rio Grande Valley
Younggil Park - Florida Polytechnic University

Phonon Scattering Engineered Thermal Radiative Transport at Nanoscales

Technical Presentation: IMECE2023-120068
Dudong Feng - Purdue University
Xiulin Ruan - Purdue University

A Three-Terminal Magnetic Thermal Transistor

Technical Presentation: IMECE2023-119733
Lorenzo Castelli - Rice University
Qing Zhu - Rice University
Trevor Shimokusu - Rice University
Geoff Wehmeyer - Rice University

Machine Learning-Based Design Optimization of Aperiodic Multilayer Coatings for Enhanced Solar Reflection

Technical Presentation: IMECE2023-119845
Krutarth Khot - Purdue University
Prabudhya Roy Chowdhury - Purdue University
Xiulin Ruan - Purdue University

Dual-Mode Operando Thermometry and Reaction Monitoring for Probing Thermal Contributions to Plasmonic Photocatalysis

Technical Presentation: IMECE2023-119760
Andrea Pickel - University of Rochester

Thickness and Strain Dependent Cross-Plane Thermal Conductivity in ReS2 With Stacking Order

Technical Presentation: IMECE2023-119843
Zefang Ye - The University of Texas at Austin
Yaguo Wang - The University of Texas at Austin
TECHNICAL SESSIONS

11-01-02: SINGLE-PHASE ENHANCED HEAT TRANSFER EQUIPMENT
11/1/2023
4:00PM–5:45PM – ROOM 278

4:00PM

Lightweight Design of 3D Modeled Tubesheet of Heat Exchanger Using Finite Element Analysis

Technical Paper Publication: IMECE2023-113761
Usman Ali Akbar - King Fahad University of Petroleum and Minerals
Khurram Masood - Proactive Engineering Solutions
Syed Sohail Akhtar - King Fahad University of Petroleum and Minerals

4:21PM

Energy and Exergy Analysis of Coiled-Tube Heat Exchanger Operated With Al₂O₃ Nanofluid

Technical Paper Publication: IMECE2023-114217
Esam Jassim - Prince Mohammad Bin Fahd University
Bashar Jasem - Al-Hadba University College

4:42PM

Applied Experimental Work Designed to Evaluate the Fundamental Heat Transfer From Rotation Only and Rotation and Translation Motion due to Complex Shapes

Technical Paper Publication: IMECE2023-111610
Aklilu G. Giorges - Georgia Institute of Technology
Comas Haynes - Georgia Institute of Technology

5:03PM

Model of a Passive Solar Tracking System
Technical Presentation: IMECE2023-117106
Luke Butler - California State Polytechnic University, Pomona
Maryam Shafahi - California State Polytechnic University, Pomona

5:24PM

Model of a Passive Solar Tracking System
Technical Presentation: IMECE2023-120297
Maryam Shafahi - California State Polytechnic University, Pomona
Luke Butler - California State Polytechnic University, Pomona
11-65-01: NEAR-FIELD RADIATIVE HEAT TRANSFER AND ENERGY CONVERSION
11/1/2023
4:00PM–5:45PM – ROOM 279

4:00 PM
On-Chip Measurement of Near Field Heat Transfer Between Sub-Wavelength Structures
Technical Presentation: IMECE2023-119557
Xiao Luo - Carnegie Mellon University
Hakan Salihoglu - Carnegie Mellon University
Zexiao Wang - Carnegie Mellon University
Zhao Li - Carnegie Mellon University
Hyeonggyun Kim - Carnegie Mellon University
Jiayu Li - Carnegie Mellon University
Bowen Yu - Carnegie Mellon University
Shen Du - Carnegie Mellon University
Sheng Shen - Carnegie Mellon University

4:21PM
Discrete System Green’s Function Solver for Near-Field Radiative Heat Transfer
Technical Presentation: IMECE2023-119604
Lívia M. Corrêa - The University of Utah
Lindsay P. Walter - The University of Utah
Jan L. Cas - The University of Utah
Mathieu Francoeur - McGill University

4:42PM
Four-Phonon Dominated Near-Field Radiation in Boron Arsenide
Technical Presentation: IMECE2023-120208
Dudong Feng - Purdue University
Xiuin Ruan - Purdue University

5:03PM
Near-Field Radiative Heat Transfer Control in Multi-Body Systems
Technical Presentation: IMECE2023-120246
Sina Khayam - University of Nebraska-Lincoln
Vahid Hatamipour - The University of Utah
Mohammad Ghashami - University of Nebraska-Lincoln

5:24PM
Electro-Optic Tuning of Thermal Radiation With III-V Semiconductors
Technical Presentation: IMECE2023-120319
Alok Ghanekar - University of Southern California
Rehan Kapadia - University of Southern California
Michelle Povinelli - University of Southern California
TECHNICAL SESSIONS

11-30-01: COMPUTATIONAL HEAT TRANSFER - APPLICATIONS
11/1/2023
4:00PM–5:45PM – ROOM 289

4:00PM

Optimized Thermal Performance of CPU Coolers Using Different Working Fluids

Technical Paper Publication: IMECE2023-115305
Shuva Das - Southern Illinois University Edwardsville
Majid Molki - Southern Illinois University Edwardsville

5:03PM

Stress Cracking in Kiln Dried Wood

Technical Presentation: IMECE2023-112831
Enayat Mahajerin - Saginaw Valley State University

5:24PM

Heat Transfer Enhancement for Circular Cylinders Undergoing Flow-Induced Vibrations: Effect of Spacing Ratio and Stagger Angle

Technical Paper Publication: IMECE2023-112807
Ussama Ali - Khalifa University of Science and Technology
Md. Islam - Khalifa University of Science and Technology
Isam Janajreh - Khalifa University of Science and Technology

4:21PM

Thermal Characteristics of Computer CPU Coolers Operating With a Pressurized Working Fluid

Technical Paper Publication: IMECE2023-117104
Shuva Das - Southern Illinois University Edwardsville
Majid Molki - Southern Illinois University Edwardsville

4:42PM

Three-Dimensional Modeling of the Whiskey Evaporation Process in Oak Barrels

Technical Presentation: IMECE2023-119307
Christopher Depcik - The University of Kansas
THURSDAY, NOVEMBER 2

11-16-01: BOILING AND CONDENSATION
11/2/2023
10:15AM–12:00PM – ROOM 277

10:15AM

Bubble Nucleation in Water-Filled 59-nm Nanochannel
Technical Presentation: IMECE2023-120222
Sajag Poudel - Syracuse University
Shalabh Maroo - Syracuse University

10:36AM

Experimental Investigation of a Device-Scale Nanochannel Evaporator
Technical Presentation: IMECE2023-120174
Durgesh Ranjan - Syracuse University
Shalabh Maroo - Syracuse University

10:57AM

Study on Molecular Dynamics Simulation With Boiling Water and Copper for Different Nanostructured Surfaces
Technical Paper Publication: IMECE2023-116819
Tanjee Afreen - University of the District of Columbia
Fisseha Gebre - University of the District of Columbia
Jiajun Xu - University of the District of Columbia

11:18AM

Swept Length Limitations on Oscillating Heat Pipe Performance
Technical Presentation: IMECE2023-115073
Zachary Wong - University of California, Los Angeles
Timothy Fisher - University of California, Los Angeles

11-59-01: FIRST PRINCIPLES AND MOLECULAR DYNAMICS SIMULATIONS OF THERMAL TRANSPORT IN SOLIDS
11/2/2023
10:15AM–12:00PM – ROOM 278

10:15AM

First Principles Prediction of Thermal Conductivity of Aluminum Oxide at High Temperatures
Technical Presentation: IMECE2023-114831
Janak Tiwari - The University of Utah
Tianli Feng - The University of Utah

10:36AM

Phonon Transport Simulations in Boron Arsenide Under Irradiation
Technical Presentation: IMECE2023-116723
Hao Zhou - The University of Utah
Tianli Feng - The University of Utah

10:57AM

Heat Diffusion Process in the Nonlinear Motion in Scwnt and Its Bundle
Technical Presentation: IMECE2023-116461
Heeyuen Koh - Seoul National University
Shigeo Maruyama - The University of Tokyo
**TECHNICAL SESSIONS**

11:18AM

*Thermal Transport in Metal-Organic Frameworks: The Influence of Water Adsorbents and Mechanical Strain*

Technical Presentation: IMECE2023-119971
Yanguang Zhou - The Hong Kong University of Science and Technology

11:39AM

*Thermal Transport in Embedded Nanoparticle Composites: A Molecular Dynamics Study of the Optimal Size Distribution*

Technical Presentation: IMECE2023-119977
Theodore Maranets - University of Nevada, Reno
Yan Wang - University of Nevada, Reno

11:18AM

*The Beverli Hill Turbulence Model Validation Experiments for CFD*

Technical Presentation: IMECE2023-113644
Chris Roy - Virginia Tech
K. Todd Lowe - Virginia Tech
William Devenport - Virginia Tech
Aurelien Borgoltz - Virginia Tech
Agata Grzyb - Virginia Tech
Advait Patil - Virginia Tech
Advait Borole - Virginia Tech
Monica Shanmugam - Virginia Tech

10:15AM

*Model Validation and Simulation Error Extrapolation in Hypersonic Aerodynamics*

Technical Presentation: IMECE2023-119927
Blake Lance - Sandia National Laboratories
Jared Kirsch - Sandia National Laboratories

10:15AM

*Using Validation Metrics to Assess RANS Turbulence Models Performance at Full Scale Reynolds Numbers*

Technical Paper Publication: IMECE2023-113498
Luis Eca - University of Lisbon
Maarten Kerkvliet - Maritime Research Institute Netherlands
Serge Toxopeus - Maritime Research Institute Netherlands

10:36AM

*Nonintrusive Manufactured Solutions for Non-Decomposing Ablation in Two Dimensions*

Technical Presentation: IMECE2023-113478
Brian Freno - Sandia National Laboratories
Brian Carnes - Sandia National Laboratories
Victor Brunini - Sandia National Laboratories
Neil Matula - Sandia National Laboratories
11-19-01: SOLID/LIQUID PHASE CHANGE PROCESSES WITH APPLICATIONS
11/2/2023
2:00PM–3:45PM – ROOM 277

2:00PM
Analytical Modeling of Metal Foam Composite Phase Change Materials (PCM) in Thermal Energy Storage Using Asymptotic Analysis
Technical Paper Publication: IMECE2023-114094

2:21PM
Graphene Aerogels to Enhance the Effective Thermal Conductivity of Phase Change Materials
Technical Paper Publication: IMECE2023-114998
Jinho Park - Georgia Tech Research Institute
John Hankinson - Georgia Tech Research Institute
Hyun Ju - Georgia Tech Research Institute
Comas Haynes - Georgia Tech Research Institute

2:42PM
Study of the Thermal Performance of a Medical Device Packaging System Using Phase Change Material
Technical Paper Publication: IMECE2023-113176
Amrut Biswal - Edwards Lifesciences
Salih Yildiz - Edwards Lifesciences
Arti Roth - Edwards Lifesciences
Sam Upadhyaya - Edwards Lifesciences

3:03PM
The Effect of Packing Fraction on the Thermal Performance of Shell-and-Tube-Based Latent Heat Energy Storage Systems
Technical Paper Publication: IMECE2023-113041
Abhinay Soanker - Lehigh University
Alparslan Oztekin - Lehigh University

3:24PM
Technical Paper Publication: IMECE2023-113579
Bingzhou Zhao - Chongqing University
Junjun Wu - Chongqing University
Qian Fu - Chongqing University
Qiang Liao - Chongqing University
Min Cheng - Chongqing University

11-60-01: SIMULATIONS OF THERMAL TRANSPORT IN NANOSTRUCTURES AND ACROSS INTERFACES
11/2/2023
2:00PM–3:45PM – ROOM 278

2:00PM
Improvement of Thermal Transport Across Graphene/Polymer Interfaces With Hydrogen Bond and Polymer Brush
Technical Presentation: IMECE2023-120141
Md Mohaiminul Islam - Temple University
Ling Liu - Temple University

2:21PM
Phonon Thermal Transport Between Two-Dimensional Materials Separated by a Vacuum Gap
Technical Presentation: IMECE2023-119974
Md Jahid Hasan Sagor - University of Maine
Sheila Edalatpour - University of Maine
TECHNICAL SESSIONS

2:42PM
Near-Interface Effects on Interfacial Phonon Transport
Technical Presentation: IMECE2023-119969
Yanguang Zhou - The Hong Kong University of Science and Technology

3:03PM
Direct Observation of Tunable Thermal Conductance at Solid/Porous Crystalline Solid Interfaces Induced by Water Adsorbents
Technical Presentation: IMECE2023-119868
Hongzhao Fan - The Hongkong University of Science and Technology
Jiawang Li - The Hongkong University of Science and Technology
Zhigang Li - The Hongkong University of Science and Technology
Yanguang Zhou - The Hong Kong University of Science and Technology
Guang Wang - The Hong Kong University of Science and Technology

3:24PM
Interfacial Thermal Conductance Spectrum in Nonequilibrium Molecular Dynamics Simulations Considering Anharmonicity, Asymmetry, and Quantum Effects
Technical Presentation: IMECE2023-119812
Yixin Xu - Hong Kong University of Science and Technology
Lina Yang - Beijing Institute of Technology
Yanguang Zhou - Hong Kong University of Science and Technology

11-22-01 TRANSPORT PHENOMENA IN ADDITIVE MANUFACTURING
11/2/2023
2:00PM–3:45PM – ROOM 276

2:00PM
Liquid Crystal Display 3-D Printing of Microencapsulated Phase-Change Material Composites
Technical Presentation: IMECE2023-120271
Isabel Melendez - Embry-Riddle Aeronautical University
Sandra Boetcher - Embry-Riddle Aeronautical University

2:21PM
Transport Phenomena in Laser Micro/nano Additive Manufacturing With Phase Change in Aqueous Reacting Fluid
Technical Presentation: IMECE2023-119956
Ming-Tsang Lee - National Tsing Hua University

2:42PM
A Numerical Model of Microstructure Formation Considering Nanoparticle Distribution During Selective Laser Melting Process
Technical Paper Publication: IMECE2023-110694
Taosif Alam - The Ohio State University
M. Ruhul Amin - Montana State University

3:03PM
Metal Transfer Behavior and Droplet Characteristics of High-Frequency Induction Heating System Towards the Development of Additive Manufacturing Process
Technical Paper Publication: IMECE2023-112268
Avadh Kishore Prasad - Indian Institute of Technology Guwahati
Swarup Bag - Indian Institute of Technology Guwahati
Sajan Kapil - Indian Institute of Technology Guwahati
M. Ruhul Amin - Montana State University
3:24PM

Optical Characterization and Modeling of Polycrystalline Moo3 Films Fabricated by Pulsed Laser Deposition

Technical Presentation: IMECE2023-119899
Chiyu Yang - Georgia Institute of Technology
Zhuomin Zhang - Georgia Institute of Technology
Maria Cristina Larciprete - Sapienza Università di Roma
Marco Centini - Sapienza Università di Roma
Roberto Macaluso - Università degli Studi di Palermo
Mauro Antezza - University of Montpellier

11-68-01: ENGINEERING STANDARDS, GUIDANCE, AND APPROACHES FOR VERIFICATION, VALIDATION, AND UNCERTAINTY QUANTIFICATION (VVUQ)

11/2/2023
2:00PM–3:45PM – ROOM 288

2:00PM

Code-Verification Techniques for Integral Equations

Technical Presentation: IMECE2023-112410
Brian Freno - Sandia National Laboratories
Neil Matula - Sandia National Laboratories

2:21PM

Overview of ASME V&V 20-2009 Standard for Verification and Validation in Computational Fluid Dynamics and Heat Transfer

Technical Presentation: IMECE2023-119870
Kevin Dowding - Sandia National Laboratories

2:42PM

Demonstrating the Use of ASME V&V 20-2009 Standard for Verification and Validation in Computational Fluid Dynamics and Heat Transfer

Technical Presentation: IMECE2023-119871
Kevin Dowding - Sandia National Laboratories

3:03PM

Deterministic Methods for Verification, Validation, and Uncertainty Quantification in Engineering Code Applications

Technical Paper Publication: IMECE2023-114382
Bart Kemper - Kemper Engineering Services, LLC
Kaylie Williams - Lockheed Martin
TECHNICAL SESSIONS

11-25-01: HEAT TRANSFER IN ELECTRONIC EQUIPMENT
11/2/2023
4:00PM–5:45PM – ROOM 276

4:00 PM
Cold Plate Heat Sink With Different Fin Shapes Using Icepak Software
Technical Paper Publication: IMECE2023-116508
Pandiyan R - SRM Institute of Science and Technology
Gnanavel B K - SRM Institute of Science and Technology
Manikandan S - SRM Institute of Science and Technology
Indirani S - SRM Institute of Science and Technology
Vibha K - SRM Institute of Science and Technology

4:21PM
Simulation of Liquid Immersion Cooling System for Small-Scale Cryptocurrency Mining Rigs
Technical Presentation: IMECE2023-114968
Faris Almutairi - Penn State Harrisburg
Ahm Rahman - Penn State Harrisburg
Issam Abu-Mahfouz - Penn State Harrisburg
Brian Maicke - Penn State Harrisburg

4:42PM
Investigation of Thermal Metamaterial Designs to Harvest Energy by Guiding Heat Energy
Technical Paper Publication: IMECE2023-113827
Md Arif Iqbal Khan - Georgia Southern University
Asef Ishraq Sadaf - Georgia Southern University
Riaz Ahmed - University of Wisconsin-Green Bay
Hossain Ahmed - Georgia Southern University

5:03PM
Numerical Investigation on Laminar Forced Convection in Triangular Cross Section Mini Ducts With Nanofluids and Rectangular Ribs
Technical Paper Publication: IMECE2023-113949
Bernardo Buonomo - Università degli Studi della Campania “Luigi Vanvitelli”
Oronzio Manca - Università degli Studi della Campania
Sergio Nardini - Università degli Studi della Campania “Luigi Vanvitelli”

5:24PM
An Experimental Model Analysis on Aerofoil Shaped Pin Fin Arrays
Technical Presentation: IMECE2023-119593
Mainak Bhaumik - Mahatma Gandhi Mission’s College of Engineering and Technology
Track 12: Mechanics of Solids, Structures, and Fluids

Topics:
12-1: Manufacturing of Polymers and Polymer-Matrix Composites: Experiments and Simulations
12-2: Modeling of the Fracture, Failure and Fatigue in Solids
12-3: Data-Enabled Predictive Modeling, Scientific Machine Learning, and Uncertainty Quantification in Computational Mechanics
12-4: Peridynamic Modeling of Materials' Behavior
12-5: Multiphysics Simulations and Experiments for Solids
12-6: Multi-scale Computations in Fluids, Structures, and Materials
12-7: Mechanical Metamaterials
12-8: Committee on Computing in Applied Mechanics (CONCAM) Distinguished Lectures on Computational Mechanics
12-9: Drucker Medal Symposium
12-10: General: Mechanics of Solids, Structures, and Fluids
12-11 Fatigue and Fracture Evaluation and Quantification for Failure Analysis
12-12: Novel Verification, Validation, and Uncertainty Quantification Techniques and Approaches for Mechanics of Solids, Structures, and Fluids Applications
12-13: Adhesive Failure Between Distinct Materials
12-14: Fracture and Failure of Reinforced Polymer Matrix Composite Materials
12-15: Mechanics and Design of Cellular Materials
12-16: Multiscale Models and Experimental Techniques for Composite Materials and Structures
12-17: Data-Driven Modeling and Simulation for Computational Biomedicine
12-18: Mechanics of Soft Materials
12-19: Computational Methods in Heterogeneous Porous Media
12-20: Functional Origami and Kirigami-Inspired Structures and Metamaterials
12-21: Instabilities in Solids and Structures
12-22: Advances in Topology Optimization
12-23: Functional Soft Composites - Design, Mechanics, and Manufacturing
12-24: Congress-Wide Symposium on NDE & SHM: Fatigue and Fracture Evaluation and Quantification for Failure Analysis

ACKNOWLEDGMENT

TRACK ORGANIZERS

Track Organizer: Kenji Takizawa, Waseda University
Track Co-Organizer: Samantha Daly, University of California, Santa Barbara

TOPIC ORGANIZERS:

Adarsh Krishnamurthy
Aditya Kumar, Georgia Institute of Technology
Adrian Buganza
Alireza Tabarraei, The University of North Carolina at Charlotte
Ashfaq Adnan, The University of Texas at Arlington
Caglar Oskay, Vanderbilt University
Danial Faghihi, University at Buffalo
Dianyun Zhang, Purdue University
Dong Qian, University of Texas at Dallas
Evgueni Filipov, University of Michigan
Florin Bobaru, University of Nebraska-Lincoln
Glaucio Paulino, Georgia Institute of Technology
H. Jerry Qi, Georgia Institute of Technology
Hongkyu Yoon
Huanyu Cheng, The Pennsylvania State University
Huck Beng Chew
Huijuan Zhao, Clemson University
Jaehyung Ju, Shanghai Jiao Tong University
Jiaze He, The University of Alabama
Johannes Weickenmeier
Jonathan Russ
Jordan R. Raney, University of Pennsylvania
## TECHNICAL SESSIONS

<table>
<thead>
<tr>
<th>Name</th>
<th>Institution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jun Li</td>
<td>University of Massachusetts Dartmouth</td>
</tr>
<tr>
<td>Kathryn Maupin</td>
<td>Sandia National Laboratories</td>
</tr>
<tr>
<td>Kenji Takizawa</td>
<td>Waseda University</td>
</tr>
<tr>
<td>Kevin Dowding</td>
<td>Sandia National Laboratories</td>
</tr>
<tr>
<td>Lihua Jin</td>
<td></td>
</tr>
<tr>
<td>Lucia Mirabella</td>
<td></td>
</tr>
<tr>
<td>Lucy Zhang</td>
<td></td>
</tr>
<tr>
<td>M. Taher A. Saif</td>
<td>University of Illinois at Urbana-Champaign</td>
</tr>
<tr>
<td>Maryam Shakiba</td>
<td>University of Colorado Boulder</td>
</tr>
<tr>
<td>Michelle Pagano</td>
<td>ASME</td>
</tr>
<tr>
<td>Miguel Aguilu</td>
<td></td>
</tr>
<tr>
<td>Ming-Chen Hsu</td>
<td></td>
</tr>
<tr>
<td>Muhammad Ali</td>
<td>Ohio University</td>
</tr>
<tr>
<td>Nikolaos Bouklas</td>
<td>Cornell University</td>
</tr>
<tr>
<td>Pania Newell</td>
<td></td>
</tr>
<tr>
<td>Ruike Zhao</td>
<td></td>
</tr>
<tr>
<td>Ryan Elliott</td>
<td>University of Minnesota Twin Cities</td>
</tr>
<tr>
<td>Samantha Daly</td>
<td>University of California, Santa Barbara</td>
</tr>
<tr>
<td>SeonHong Na</td>
<td></td>
</tr>
<tr>
<td>Shank Kulkarni</td>
<td>Pacific Northwest National Laboratory</td>
</tr>
<tr>
<td>Stavros Gaitanaros</td>
<td>Johns Hopkins University</td>
</tr>
<tr>
<td>Victor Lefevre</td>
<td>Northwestern University</td>
</tr>
<tr>
<td>WaiChing Sun</td>
<td></td>
</tr>
<tr>
<td>Wanliang Shan</td>
<td>Syracuse University</td>
</tr>
<tr>
<td>Xiang Zhang</td>
<td>University of Wyoming</td>
</tr>
<tr>
<td>Yongjie Zhang</td>
<td></td>
</tr>
<tr>
<td>Yozo Mikata</td>
<td>Fluor</td>
</tr>
<tr>
<td>Yuan Gao</td>
<td>University of Illinois</td>
</tr>
<tr>
<td>Yuhang Hu</td>
<td>Georgia Institute of Technology</td>
</tr>
<tr>
<td>Yurius Dzenis</td>
<td>University of Nebraska-Lincoln</td>
</tr>
<tr>
<td>Evgueni Filipov</td>
<td>University of Michigan</td>
</tr>
<tr>
<td>Fei Song</td>
<td>Schlumberger Limited</td>
</tr>
<tr>
<td>Florin Bobaru</td>
<td>University of Nebraska-Lincoln</td>
</tr>
<tr>
<td>Glaucio Paulino</td>
<td>Georgia Institute of Technology</td>
</tr>
<tr>
<td>Guruswami Ravichandran</td>
<td>Caltech</td>
</tr>
<tr>
<td>Huanyu Cheng</td>
<td>The Pennsylvania State University</td>
</tr>
<tr>
<td>Huck Beng Chew</td>
<td></td>
</tr>
<tr>
<td>Huijuan Zhao</td>
<td>Clemson University</td>
</tr>
<tr>
<td>Jaehyung Ju</td>
<td>Shanghai Jiao Tong University</td>
</tr>
<tr>
<td>Jiaze He</td>
<td>The University of Alabama</td>
</tr>
<tr>
<td>Jordan R. Raney</td>
<td>University of Pennsylvania</td>
</tr>
<tr>
<td>Juner Zhu</td>
<td>Massachusetts Institute of Technology</td>
</tr>
<tr>
<td>Jungkyu Park</td>
<td>Kennesaw State University</td>
</tr>
<tr>
<td>Kathryn Maupin</td>
<td>Sandia National Laboratories</td>
</tr>
<tr>
<td>Kenji Takizawa</td>
<td>Waseda University</td>
</tr>
<tr>
<td>Kevin Dowding</td>
<td>Sandia National Laboratories</td>
</tr>
<tr>
<td>Lihua Jin</td>
<td></td>
</tr>
<tr>
<td>Maryam Shakiba</td>
<td>University of Colorado Boulder</td>
</tr>
<tr>
<td>Michelle Pagano</td>
<td>ASME</td>
</tr>
<tr>
<td>Muhammad Ali</td>
<td>Ohio University</td>
</tr>
<tr>
<td>Nikolaos Bouklas</td>
<td>Cornell University</td>
</tr>
<tr>
<td>Ryan Elliott</td>
<td>University of Minnesota Twin Cities</td>
</tr>
<tr>
<td>Samantha Daly</td>
<td>University of California, Santa Barbara</td>
</tr>
<tr>
<td>Shank Kulkarni</td>
<td>Pacific Northwest National Laboratory</td>
</tr>
<tr>
<td>Stavros Gaitanaros</td>
<td>Johns Hopkins University</td>
</tr>
<tr>
<td>Stewart Silling</td>
<td>Sandia National Laboratories</td>
</tr>
<tr>
<td>Suraj Ravindran</td>
<td>University of Minnesota</td>
</tr>
<tr>
<td>Victor Lefevre</td>
<td>Northwestern University</td>
</tr>
<tr>
<td>Xiang Zhang</td>
<td>University of Wyoming</td>
</tr>
<tr>
<td>Yongjie Jessica Zhang</td>
<td>Carnegie Mellon University</td>
</tr>
<tr>
<td>Yozo Mikata</td>
<td>Fluor</td>
</tr>
<tr>
<td>Yuan Gao</td>
<td>University of Illinois</td>
</tr>
<tr>
<td>Yuhang Hu</td>
<td>Georgia Institute of Technology</td>
</tr>
<tr>
<td>Yurius Dzenis</td>
<td>University of Nebraska-Lincoln</td>
</tr>
</tbody>
</table>

## SESSION CHAIRS:

- **Alireza Tabarraei**, The University of North Carolina at Charlotte
- Caglar Oskay, Vanderbilt University
- Danial Faghihi, University at Buffalo
- Dianyun Zhang, Purdue University
TECHNICAL SESSIONS

TRACK 12: MECHANICS OF SOLIDS, STRUCTURES, AND FLUIDS

MONDAY, OCTOBER 30

12-03-01: DATA-ENABLED PREDICTIVE MODELING, SCIENTIFIC MACHINE LEARNING, AND UNCERTAINTY QUANTIFICATION IN COMPUTATIONAL MECHANICS
10/30/2023
10:45AM–12:30PM – ROOM 274

10:45AM
Accelerated Discovery of Material Physics Using AI/ML Approaches

Technical Presentation: IMECE2023-111794
Surya Kalidindi - Georgia Institute of Technology

11:06AM
Full-Field Characterization of Shock Response in Particulate Composites

Technical Presentation: IMECE2023-120032
Barry Lawlor - California Institute of Technology
Suraj Ravindran - University of Minnesota
Vatsa Gandhi - California Institute of Technology
Guruswami Ravichandran - California Institute of Technology

11:27AM
Incorporating Experimental Neurite Features Into an IGA Neuron Growth Model and CNN-Based Prediction

Technical Presentation: IMECE2023-112548
Yongjie Jessica Zhang - Carnegie Mellon University

11:48AM
MetaNO: How to Transfer Your Knowledge on Learning Hidden Physics

Technical Presentation: IMECE2023-114321
Yue Yu - Lehigh University

12:09PM

Technical Presentation: IMECE2023-113178
Wei Li - Northeastern University
Martin Z. Bazant - Massachusetts Institute of Technology

10:45AM

12-09-01: DRUCKER MEDAL SYMPOSIUM
10/30/2023
10:45AM–12:30PM – ROOM 275

10:45AM
Full-Field Characterization of Shock Response in Particulate Composites

Technical Presentation: IMECE2023-120032
Barry Lawlor - California Institute of Technology
Suraj Ravindran - University of Minnesota
Vatsa Gandhi - California Institute of Technology
Guruswami Ravichandran - California Institute of Technology

11:06AM
Small-Scale Split Hopkinson Pressure Bar to Investigate Local Deformation Behavior in Materials Under Extreme Strain Rates

Technical Presentation: IMECE2023-120119
Suraj Ravindran - University of Minnesota Twin Cities
Mouliswar Ramapuram Ramakumaresan - University of Minnesota Twin Cities
Rick Marcusen - University of Minnesota Twin Cities

11:27AM
Loading-Unloading Compressive Response and Energy Dissipation of Liquid Crystal Elastomers and Their 3D Printed Lattice Structures at Low and Intermediate Strain Rates

Technical Presentation: IMECE2023-112275
Bo Song - Sandia National Laboratories
Dylan Landry - Sandia National Laboratories
Thomas Martinez - Sandia National Laboratories
Christopher Chung - University of Colorado Denver
Kevin Long - Sandia National Laboratories
Kai Yu - University of Colorado Denver
Chris Yakacki - University of Colorado Denver
<table>
<thead>
<tr>
<th>Time</th>
<th>Session Title</th>
<th>Presenter(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>11:48AM</td>
<td>Probing Material Damage After Violently Collapsing Cavitation in Soft Viscoelastic Materials</td>
<td>Jin Yang - The University of Texas at Austin</td>
</tr>
<tr>
<td>12:09PM</td>
<td>Physics-Informed Data-Driven Constitutive Modeling of Strain Rate Sensitive Soft Materials</td>
<td>Kshitiz Upadhyay - Louisiana State University, Jan Niklas Fuhg - Cornell University, Nikolaos Bouklas - Cornell University, K.T. Ramesh - Johns Hopkins University</td>
</tr>
<tr>
<td>2:42PM</td>
<td>Discovery of Multi-Functional Polyimides Through High-Throughput Screening Using Explainable Machine Learning</td>
<td>Ying Li - University of Wisconsin-Madison</td>
</tr>
<tr>
<td>3:03PM</td>
<td>Physics Informed Neural Networks for Uncertainty Propagation for Alleviating the Curse of Dimensionality</td>
<td>Kirubel Teferra - U.S. Naval Research Laboratory</td>
</tr>
<tr>
<td>2:00PM</td>
<td>Multi-Material Design Under Uncertainty of Building Envelopes Thermal Insulation</td>
<td>Danial Faghihi - University at Buffalo, Jingye Tan - University at Buffalo</td>
</tr>
<tr>
<td>2:21PM</td>
<td>Self-Directed Online Machine Learning</td>
<td>Wei Lu - University of Michigan</td>
</tr>
<tr>
<td>2:42PM</td>
<td>Identification of the Viscoelastic, Post-Necking Behavior of a Semicrystalline Thermoplastic Using Only Nominal Mechanical Measurements</td>
<td>Kenneth Cundiff - Sandia National Laboratories, Georges Ayoub - University of Michigan-Dearborn, Amine Benzerga - Texas A&amp;M University</td>
</tr>
</tbody>
</table>
**TECHNICAL SESSIONS**

**2:21PM**

**3D Auxetic Two-Phase Mechanical Metamaterial With High Impact Resistance**

Technical Presentation: IMECE2023-120066  
Tiantian Li - Northeastern University  
Ammar Batwa - Northeastern University  
Yaning Li - Northeastern University

**2:42PM**

**Convolution Finite Element Methods for Digital Image Correlation**

Technical Presentation: IMECE2023-116633  
Ye Lu - University of Maryland, Baltimore County

**3:03PM**

**Effects of Roller Shape of Enveloping Speed Reducer on Its Lubrication Performance**

Technical Presentation: IMECE2023-109847  
Yucheng Liu - South Dakota State University

**3:24PM**

**Cellulose-Hemicellulose-Lignin Interaction in Coconut Endocarp**

Technical Presentation: IMECE2023-120303  
Ning Zhang - Baylor University  
Sharmi Mazumder - Baylor University

**4:00PM onwards**

**12-03-03: DATA-ENABLED PREDICTIVE MODELING, SCIENTIFIC MACHINE LEARNING, AND UNCERTAINTY QUANTIFICATION IN COMPUTATIONAL MECHANICS**

10/30/2023  
4:00PM–5:45PM – ROOM 274

**4:00PM**

**Topology Optimization Using Neural Network for Stress Constrained Problems**

Technical Paper Publication: IMECE2023-109442  
Md Imrul Reza Shishir - The University of North Carolina at Charlotte  
Alireza Tabarraei - The University of North Carolina at Charlotte

**4:21PM**

**Feature Importance and Uncertainty Quantification of Machine Learning Model in Materials Science**

Technical Paper Publication: IMECE2023-112990  
Zhichen Liu - University of Illinois at Urbana-Champaign  
Akash Singh - University of Illinois at Urbana-Champaign  
Yumeng Li - University of Illinois at Urbana-Champaign
**TECHNICAL SESSIONS**

4:42PM

**Material Model Parameters Optimization in Liquid Mercury Target Dynamics Simulation With Machine Learning Surrogates**

Technical Paper Publication: IMECE2023-113604

Lianshan Lin - Oak Ridge National Laboratory  
Hoang Tran - Oak Ridge National Laboratory  
Majdi Radaideh - University of Michigan  
Sarma Gorti - Oak Ridge National Laboratory  
Srdjan Simunovic - Oak Ridge National Laboratory  
Hao Jiang - Oak Ridge National Laboratory  
Drew Winder - Oak Ridge National Laboratory  
Sarah Cousineau - Oak Ridge National Laboratory

---

4:00PM

**Solving Flows Across Rotor and Stator Cascades With Local Neural Operator for Computational Fluid Dynamics**

Technical Paper Publication: IMECE2023-116339

Ximeng Ye - Xi’an Jiaotong University  
Hongyu Li - Xi’an Jiaotong University  
Guoliang Qin - Xi’an Jiaotong University

---

5:03PM

**Multiphysics-Informed Machine Learning for Mechanical-Induced Degradation of Silicon Anode**

Technical Paper Publication: IMECE2023-113404

Parth Bansal - University of Illinois at Urbana-Champaign  
Yumeng Li - University of Illinois at Urbana-Champaign

---

4:21PM

**Investigation of the Structural Behavior of Countersunk Bolts Under Multi-Directional Loading**

Technical Paper Publication: IMECE2023-112150

Tuğrul Aksoy - Roketsan  
Başar Altıntaş - Roketsan  
Ahker Güneş Dilber - Roketsan

---

4:24PM

**Graphics Processing Units’ Accelerated Navier-Stokes Solvers for Unstructured Meshes: A Literature Review**

Technical Paper Publication: IMECE2023-112786

Christopher Morris - University of North Dakota  
Njiru Mwaura - University of North Dakota  
David Schneider - University of North Dakota  
Fnu Tabish - University of North Dakota  
Duncan Carpenter - University of North Dakota  
Nathan Clark - University of North Dakota  
Anjali Sandip - University of North Dakota
TECHNICAL SESSIONS

4:42PM

Mechanical, Structural, and Electronic Coupling During Metal-Insulator Transitions in VO₂ Thin Films

Technical Presentation: IMECE2023-113432
Matt Pharr - Texas A&M University
Yuwei Zhang - Texas A&M University

5:03PM

Weighted Mori-Tanaka Approach for Homogenization of Particulate Composites at High Filler Fractions

Technical Paper Publication: IMECE2023-112951
Mobashar Kabir - Sultan Qaboos University
Tasneem Pervez - Sultan Qaboos University
Sayyad Z. Qamar - Sultan Qaboos University
Farooq K.S. Al-Jahwari - Sultan Qaboos University

5:24PM

Bioinspired Toughening in Multiscale Two-Dimensional Lattices

Technical Presentation: IMECE2023-112680
Adam Brown - California State University, Northridge
Jamie Booth - California State University, Northridge

TUESDAY, OCTOBER 31

12-10-03: GENERAL: MECHANICS OF SOLIDS, STRUCTURES, AND FLUIDS

10/31/2023
10:15AM–12:00PM – ROOM 278

10:15AM

Characterizing High-Speed Impact Behavior of UHMWPE Through Molecular Dynamics Simulation

Technical Paper Publication: IMECE2023-112860
Guodong Guo - Texas A&M University
Shah Alam - Texas A&M University-Kingsville

10:36AM

In-Situ Calibration for Load Cells in 3D Printed Bipedal Robot Using 3D Modeling in Computer-Aided Design Environment

Technical Paper Publication: IMECE2023-116869
Tung Le - Virginia Polytechnic Institute and State University
Connor Herron - Virginia Polytechnic Institute and State University
Alexander Leonessa - Virginia Polytechnic Institute and State University

10:57AM

Friction Moments in Single and Double Contact Points in Deep Prerolling: Precision Positioning Under Oscillatory Motion Condition

Technical Paper Publication: IMECE2023-111322
Samir Mekid - King Fahd University of Petroleum and Minerals
N. Riznookaya - Belarusian National Technical University
11:18AM

Raster Angle and Infill Percentage Influence on Selected Mechanical Properties of 3D Printed Polyethylene Terephthalate Glycol (PETG) and High Impact Polystyrene (HIPS)

Technical Paper Publication: IMECE2023-113203
Aaron Adams - Kennesaw State University
Cameron Coates - Kennesaw State University
Eugene Carlson - Kennesaw State University
Andrew Tiller - Kennesaw State University

11:39AM

In-Situ Damage Progression Observations in Cross-Ply CFRP Composite Beams Under Low-Velocity Impact and Quasi-Static Indentation Loading

Technical Paper Publication: IMECE2023-112520
Onur Ali Batmaz - Middle East Technical University
Demirkan Coker - Middle East Technical University

10:57AM

Strain-Programmable Particle Transport in Hydrogels

Technical Presentation: IMECE2023-120173
Shaojie Lin - Michigan State University

11:18AM

Data-Driven Prediction of Steady State Waves in Viscoelastic Solids

Technical Presentation: IMECE2023-120292
(Amir) Hossein Salahshoor - Duke University

11:39AM

Uncovering Plant Mechanics Using a Micro-Mechanical Tensile Stage Coupled With Confocal Microscopy

Technical Presentation: IMECE2023-119784
Si Chen - Cornell University
Adrienne Roeder - Cornell University
Meredith Silberstein - Cornell University

12:00PM

Multiphysics Modeling of Grayscale Digital Light Processing Printing for Creating Multifunctional Composites

Technical Presentation: IMECE2023-120101
S. Macrea Montgomery - Georgia Institute of Technology
H. Jerry Qi - Georgia Institute of Technology
<table>
<thead>
<tr>
<th>Time</th>
<th>Session Title</th>
<th>Location</th>
<th>Presenters</th>
</tr>
</thead>
<tbody>
<tr>
<td>2:21PM</td>
<td>Relaxation Effects of Soft Artificial Fabric Muscle Actuators for Launch and Recovery Systems</td>
<td>Room 279</td>
<td>Michael Smith - Naval Undersea Warfare Center</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Paul Cavallaro - Naval Undersea Warfare Center</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Allison Redington - Naval Undersea Warfare Center</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Jacob O'Donnell - Naval Undersea Warfare Center</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Eric Warner - Naval Undersea Warfare Center</td>
</tr>
<tr>
<td>2:42PM</td>
<td>Mechanics of Piezo-Electrochemistry to Enable Li Metal Battery</td>
<td>Room 279</td>
<td>Wei Lu - University of Michigan</td>
</tr>
<tr>
<td>3:03PM</td>
<td>Discrete Element Method-Based Investigation of Settling Powder Packs in Thermally Damaged Detonators</td>
<td>Room 279</td>
<td>Ki Wolf - Sandia National Laboratories</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Joel Clemmer - Sandia National Laboratories</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Mike Hobbs - Sandia National Laboratories</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Dan Bolintineanu - Sandia National Laboratories</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Judith Brown - Sandia National Laboratories</td>
</tr>
<tr>
<td>12-18-02</td>
<td>MECHANICS OF SOFT MATERIALS</td>
<td>Room 279</td>
<td>Tina Ko - The University of Texas at Arlington</td>
</tr>
<tr>
<td>10/31/2023</td>
<td>Effect of Defect Geometry on the Tensile Failure of Polydimethylsiloxane (PDMS)</td>
<td>Room 279</td>
<td>Yukti Shinglot - The University of Texas at Arlington</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Ashfaq Adnan - The University of Texas at Arlington</td>
</tr>
<tr>
<td>2:21PM</td>
<td>Fully Water-Based, High-Temperature Thermoset Sealant Resin</td>
<td>Room 279</td>
<td>Elizabeth Contreras - Aramco Americas</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Thomas Heinold - Saudi Aramco</td>
</tr>
<tr>
<td>3:03PM</td>
<td>A Statistical Mechanics-Based Gradient-Enhanced Damage Model for Elastomeric Materials</td>
<td>Room 279</td>
<td>Mulderrig Jason - Cornell University</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Brandon Talamini - Lawrence Livermore National Laboratory</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Nikolaos Bouklas - Cornell University</td>
</tr>
<tr>
<td>3:03PM</td>
<td>Structural Rigidity Analysis of Inflatable Wing Designs Constructed With High-Performance Fabric Membranes</td>
<td>Room 279</td>
<td>Yuyang Song - Toyota Research Institute of North America,</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Paul Cavallaro - Next Gen Structures &amp; Technologies LLC</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Ali Sadegh - The City College of City University of New York</td>
</tr>
</tbody>
</table>
12-20-01: FUNCTIONAL ORIGAMI AND KIRIGAMI-INSPIRED STRUCTURES AND METAMATERIALS
10/31/2023
4:00PM–5:45PM – ROOM 278

4:00PM

3D Curvilinear Morphing of Origami by 4D Printed Panel Deformation

Technical Presentation: IMECE2023-119960
Zihe Liang - UM-SJTU Joint Institute, Shanghai Jiao Tong University
Sibo Chai - Tianjin University
Qinyun Ding - Southeast University
Jiayao Ma - Tianjin University
Jaehyung Ju - UM-SJTU Joint Institute, Shanghai Jiao Tong University

4:21PM

Collapsible Origami-Based, Drop-Deployable Micro Air Gliders

Technical Paper Publication: IMECE2023-109491
Hannah Kolano - Olin College of Engineering
Miranda Lao - Olin College of Engineering
Anil Patel - Olin College of Engineering
Maxmilian Wei - Olin College of Engineering
Jingyi Xu - Olin College of Engineering
Christopher Lee - Olin College of Engineering

4:42PM

Harnessing Origami Mechanics for Large-Scale Systems That Support Structural Loads

Technical Presentation: IMECE2023-120146
Evgueni Filipov - University of Michigan

5:03PM

Design of an Extendable Robot Arm Based on Origami Foldpatterns

Technical Paper Publication: IMECE2023-111586
Markus Huber - Technical University of Munich
Judith Merz - RWTH Aachen University
Christoph Rehekampff - Technical University of Munich
Franz Irlinger - Technical University of Munich
Tim C. Lueth - Technical University of Munich

12-18-03: MECHANICS OF SOFT MATERIALS
10/31/2023
4:00PM–5:45PM – ROOM 279

4:00PM

Thermomechanical Coupling in Monodomain and Polydomain Liquid Crystal Elastomers

Technical Presentation: IMECE2023-113070
Ruobing Bai - Northeastern University
## TECHNICAL SESSIONS

### WEDNESDAY, NOVEMBER 1

#### 12-15-01: MECHANICS AND DESIGN OF CELLULAR MATERIALS

**11/1/2023**

**10:45AM–12:30PM – ROOM 288**

### 10:45AM

**Energy Absorbing Analysis and Deformation Modes of Crush Tube With Tapered Geometry**

Technical Paper Publication: IMECE2023-112987

Sean Jenson - Ohio University  
Muhammad Ali - Ohio University

### 11:06AM

**Variable Geometry Crush Tube With Induced Folding Mechanisms**

Technical Paper Publication: IMECE2023-112996

Sean Jenson - Ohio University  
Muhammad Ali - Ohio University

### 11:27AM

**Investigation Into Mechanical Properties of Expanded Polystyrene Fresh Fish Boxes Using Finite Element Analysis and Experimental Methods**

Technical Paper Publication: IMECE2023-113480

Ziwei Lu - University of Iceland  
Fjóla Jónsdóttir - University of Iceland  
Sigurjón Arason - Matís ohf  
Björn Margeirsson - Sæplast Iceland ehf.

### 11:48AM

**Investigating the Role of Infill Geometry and Density on the Mode-I Fracture Toughness of Polymeric Materials Fabricated by Fused Filament Fabrication**

Technical Paper Publication: IMECE2023-114986

Denizhan Yavas - Lamar University

### 12:09PM

**Taro Nakayama - University of Tokyo  
Masato Kato - University of Tokyo  
Shinya Haga - University of Tokyo**

---

### 4:21PM

**Temperature-Switchable Adhesives Enabled by Thermo-Responsive Soft Active Materials**

Technical Presentation: IMECE2023-112619

Ruobing Bai - Northeastern University

### 4:42PM

**Adhesion Mechanics of Soft Hollow Pillars for Highly Tunable Dry Adhesion**

Technical Presentation: IMECE2023-120332

Wanliang Shan - Syracuse University

### 5:03PM

**Modeling of Rate Effects in Detachment of Mushroom-Shaped Adhesive Structures**

Technical Paper Publication: IMECE2023-112383

Ruozhang Li - Shanghai Jiao Tong University  
Dongwu Li - Northwestern Polytechnical University  
Wenming Zhang - Shanghai Jiao Tong University

### 5:24PM

**Geometry, Mechanics, and Design of Curved Woven Structures**

Technical Presentation: IMECE2023-113423

Tian Chen - University of Houston

**Technical Presentation:** IMECE2023-119926  
Francisco Lopez Jimenez - University of Colorado Boulder  
Golnar Gharooni Fard - University of Colorado Boulder  
Orit Peleg - University of Colorado Boulder, Santa Fe Institute

**12-14-01: Fracture and Failure of Reinforced Polymer Matrix Composite Materials**  
11/1/2023  
2:00PM–3:45PM – ROOM 280

**3:03PM**  
**Improving the Load Carrying Capacity of Highly Tapered Laminates**  
Technical Paper Publication: IMECE2023-111491  
Firat Ergin - Middle East Technical University  
Altan Kayran - Middle East Technical University

**3:24PM**  
**Investigating the Interlaminar Shear Strength of Short Carbon Fiber-Reinforced PEEK Composites Fabricated by Fused Filament Fabrication**  
Technical Paper Publication: IMECE2023-114936  
Denizhan Yavas - Lamar University  
Luis Sosa - Lamar University

### Crack Face Friction Effects on the Transverse Compressive Failure and Size Effect in Fiber Reinforced Composites

**Technical Presentation:** IMECE2023-119783  
Kedar Kirane - Stony Brook University  
Jing Xue - Stony Brook University

**2:21PM**  
**Inhibition of Crack Propagation of Polymer Reinforced Composites by Angular Orientations Against Impact Failure**  
Technical Presentation: IMECE2023-112587  
Md Salah Uddin - University of Texas Permian Basin

**2:42PM**  
**Buckling Analysis of Filament-Wound Cylindrical Shells Considering Pattern Effect**  
Technical Paper Publication: IMECE2023-111319  
Emre Özaslan - Repkon  
Ali Yetgin - Repkon  
Bülent Acar - Repkon

### 12-16-01: Multiscale Models and Experimental Techniques for Composite Materials and Structures Count

11/1/2023  
2:00PM–3:45PM – ROOM 288

**3:03PM**  
**Mesomechanics of Highly Filled Particle Reinforced Composites Using a Bonded Particle Method**  
Technical Presentation: IMECE2023-120080  
Joel Clemmer - Sandia National Laboratories  
Kevin Long - Sandia National Laboratories  
Judith Brown - Sandia National Laboratories

**3:21PM**  
**The Influence of Microstructure Models on the Mechanical Behavior of Nickel Coated Continuous Carbon Fiber Reinforced Aluminum Metal Matrix Composites**  
Technical Paper Publication: IMECE2023-114083  
Olanrewaju Aluko - University of Michigan-Flint  
Yasser Aboelkassem - University of Michigan-Flint
TECHNICAL SESSIONS

2:42PM

Photo Switchable Optical Property of Two-Dimensional Transition Metal Dichalcogenides
Poster Paper Publication: IMECE2023-111520
Connor Cunningham - University of St. Thomas
Srajan Pillai - University of St. Thomas
Jeong Ho You - University of St. Thomas
Jaehoon Ji - Purdue University
Jong Hyun Choi - Purdue University

3:03PM

The Failure Mechanism in Cfrp Cross-Ply Curved Composite Laminates
Technical Paper Publication: IMECE2023-112524
Ahmet Çevik - Middle East Technical University
Demirkan Çöker - Middle East Technical University

4:21PM

Quantifying the Impacts of Weather Year Selection on Power Sector Capacity Expansion Models
Technical Presentation: IMECE2023-120035
Braden Pecora - The University of Texas at Austin
Melina Katsiouroumba - The University of Texas at Austin
Joshua Rhodes - The University of Texas at Austin
Michael Webber - The University of Texas at Austin

4:42PM

Verification Process for Finite Element Modelling Technique Used in Biological Hard Tissue
Technical Paper Publication: IMECE2023-114061
Molly Townsend - University of California, Davis
Matthew Mills - University of California, Davis
Nesrin Sarigüllü-Klijn - University of California, Davis

5:03PM

Positioning Accuracy Evaluation Along Helical Paths Using a Telescoping Ballbar
Technical Paper Publication: IMECE2023-112143
Kanglin Xing - École de technologie supérieure
J.R.R. Mayer - Polytechnique Montreal
Ilian A. Bonnev - École de technologie supérieure
Henri Champliaud - École de technologie supérieure
Zhaoheng Liu - École de technologie supérieure
TECHNICAL SESSIONS

12-06-01: MULTI-SCALE COMPUTATIONS IN FLUIDS, STRUCTURES, AND MATERIALS
11/1/2023
4:00PM–5:45PM – ROOM 288

4:00PM
Advancing Understanding of Sliding Wear: A Multi-Scale Approach and Improvement of Archard’s Wear Law
Technical Presentation: IMECE2023-119853
Jamal Choudhry - Luleå University of Technology
Andreas Almqvist - Luleå University of Technology
Roland Larsson - Luleå University of Technology

4:21PM
Uniaxial Compression of Spherical Gold Nanoparticles: A Molecular Dynamics Study
Technical Presentation: IMECE2023-114240
Tanuj Gupta - Clemson University
Michael Cai Wang - University of South Florida
Huijuan Zhao - Clemson University

4:42PM
Investigating the Mechanics of Ti-TiB Interfaces at Multiple Scales
Technical Presentation: IMECE2023-112321
Shaoping Xiao - The University of Iowa

5:03PM
Numerical Investigation of the Effect of the Spark Plug Electrode Gap on Flame Propagation Under Engine-Like Conditions
Technical Paper Publication: IMECE2023-112015
Fernanda Pinheiro Martins - General Motors
Pedro Teixeira Laccava - Technological Institute of Aeronautics

5:24PM
Modeling Liquid Droplet Impact on a Micropillar-Arrayed Viscoelastic Surface via Mechanically Averaged Responses
Technical Paper Publication: IMECE2023-112171
Yang Li - Virginia Tech
Jiangtao Cheng - Virginia Tech
THURSDAY, NOVEMBER 2

12-02-01: MODELING OF THE FRACTURE, FAILURE, AND FATIGUE IN SOLIDS
11/2/2023
10:15AM–12:00PM – ROOM 288

10:15AM
Computational and Experimental Study on Effect of Increased Makeup Torque on Fatigue Life of Rotary Shouldered Connections
Technical Paper Publication: IMECE2023-113082
Fei Song - Schlumberger
Michael Du - Schlumberger
Ke Li - Schlumberger

10:36AM
Investigation of the Effect of Bolt Twisting Resulting From Fastening Process on Self-Loosening Behavior of Bolted Joint
Technical Presentation: IMECE2023-119802
Dongwon Kim - Hanyang University
Juhyun Nam - Hanyang University
Jiao Yixuan - Hanyang University
Je Hoon Oh - Hanyang University

10:57AM
Determine the Maximum Negative Operating and Collapse Pressure of Stocked Spiral Duct With and Without Corrugations
Technical Paper Publication: IMECE2023-112583
Justin Harvey - Tennessee Tech University
Charles D Walker - Tennessee Tech University
Venkata Avinash Paruchuri - University of Wisconsin-Platteville
Stephen Idem - Tennessee Tech University

11:18AM
Inferring Crack Path and Crack Growth Resistance Using Evolving Graphs
Technical Presentation: IMECE2023-119949
Ankit Srivastava - Texas A&M University

11:39AM
Smallest Feasible Statistical Volume Elements for Ductile Fracture of Metals With Non-Periodic Particle Morphology
Technical Presentation: IMECE2023-113595
Caleb Foster - Texas A&M University
Justin Wilkerson - Texas A&M University

12-11-01: FATIGUE AND FRACTURE EVALUATION AND QUANTIFICATION FOR FAILURE ANALYSIS
11/2/2023
10:15AM–12:00PM – ROOM 280

10:15AM
Failure Analysis of Transmission Components of Rail Transit Vehicles
Technical Paper Publication: IMECE2023-109922
Long Zhang - CRRC-Changchun
Yanbo Yin - CRRC MA Corporation
Zhenghui Shan - CRRC-Changchun
Zida Wang - CRRC MA
Yanping Zhang - CRRC MA
Lvxian Wu - CRRC-Changchun
Hang Lu - CRRC MA
Hong Zhang - CARRC MA
TECHNICAL SESSIONS

10:36AM

Acceleration of Creep-Fatigue Damage of Ni-Base Alloy by Viscoelasticity at Elevated Temperature

Technical Paper Publication: IMECE2023-112200
Hideo Miura - Tohoku University
Ayane Yasumura - Tohoku University
Takuma Yamawaki - Tohoku University
Takuto Kudo - Tohoku University
Hayato Matsuda - Tohoku University
Le Xu - Tohoku University

10:57AM

Machine Learning-Based Fatigue Life Evaluation of the Pump Spindle Assembly With Parametrized Geometry

Technical Paper Publication: IMECE2023-112245
Lizhe Wang - Xi’an Jiaotong-Liverpool University
Zhichao Zhang - Xi’an Jiaotong-Liverpool University
Min Chen - Xi’an Jiaotong-Liverpool University
Junyi Xie - Grundfos China Holding Co., Ltd.
Fuyuan Liu - Xi’an Jiaotong-Liverpool University
Hang Yuan - Xi’an Jiaotong-Liverpool University
Zhouyi Xiang - Xi’an Jiaotong-Liverpool University
Lingyun Yu - Xi’an Jiaotong-Liverpool University

11:18AM

Failure Analysis and Redesign of a 14th to 15th Century Replica Cannon Mount

Technical Paper Publication: IMECE2023-112305
Luke Barrow - United States Military Academy
Nathaniel Helminiak - United States Military Academy

11:39AM

On the Fatigue Capacity of a Subsea Intervention System Tool

Technical Paper Publication: IMECE2023-114416
Ali Sepehri - SLB
Gaurav Bansal - SLB
TECHNICAL SESSIONS

12-02-02: MODELING OF THE FRACTURE, FAILURE, AND FATIGUE IN SOLIDS  
11/2/2023  
2:00PM–3:45PM – ROOM 280

2:00PM
Impact on Wrinkled Graphene

Technical Paper Publication: IMECE2023-112670
Asher Flanagan - Kennesaw State University
Jungkyu Park - Kennesaw State University

2:21PM
Microstructure-Chemomechanics Relations of Polycrystalline Cathodes in Solid-State Batteries

Technical Presentation: IMECE2023-113196
Avtar Singh - National Renewable Energy Laboratory
Wei Li - Northeastern University
Trevor Martin - National Renewable Energy Laboratory
Donal P. Finegan - National Renewable Energy Laboratory
Juner Zhu - Northeastern University

2:42PM
Discrete, Meso-Scale Modeling of Fiber-Reinforced Composites (DM4C): Application to the Additive Manufacturing of Continuous Fibers

Technical Presentation: IMECE2023-113081
Marco Salviato - University of Washington
Antonio Deleo - University of Washington
Sean Phenisee - University of Washington
Daniele Pelessone - ES3 Inc.
Mark Flores - Air Force Research Laboratory

3:03PM
A Numerical and Experimental Investigation About Tensile Fracture in Epoxy Composite Grout Under Thermo-Mechanical Load

Technical Paper Publication: IMECE2023-112979
Nahri S. Waseetuddin - King Fahd University of Petroleum and Minerals
Abba A. Abubakar - King Fahd University of Petroleum and Minerals

3:24PM
A Numerical and Experimental Analysis of Compression-Induced Cracking in Epoxy Composite Grout Under Thermo-Mechanical Loading

Technical Paper Publication: IMECE2023-112962
Nahri S. Waseetuddin - King Fahd University of Petroleum and Minerals
Abba A. Abubakar - King Fahd University of Petroleum and Minerals
Khaled S. Al-Athel - King Fahd University of Petroleum and Minerals
Syed S. Akhtar - King Fahd University of Petroleum and Minerals

12-07-01: MECHANICAL METAMATERIALS  
11/2/2023  
2:00PM–3:45PM – ROOM 289

2:00PM
3D Axial-Bending Coupling Effect by Lattice Symmetry and Generalized Micropolar Homogenization

Technical Presentation: IMECE2023-120050
Jaehyung Ju - Shanghai Jiao Tong University
Dijia Zhong - Shanghai Jiao Tong University
12-21-01: INSTABILITIES IN SOLIDS AND STRUCTURES
11/2/2023
2:00PM–3:45PM – ROOM 279

2:00PM
Compressive Response and Vibration Frequencies of Crumpled Thin-Walled Structures
Technical Presentation: IMECE2023-120394
Vishwa Mohan Tiwari - University of Michigan
Avinkrishnan Ambika Vijayachandran - University of Michigan
Royan D’mello - University of Michigan
Anthony Waas - University of Michigan

2:21PM
Effects of Ply-Level Imperfections and Space Environments on Bistability of Ultrathin Composite Booms
Technical Presentation: IMECE2023-113534
Chloe Zarader - Pennsylvania State University
Xin Ning - Pennsylvania State University

2:42PM
Experimentally Probing the Stability of Thin-Shell Structures Under Pure Bending
Technical Presentation: IMECE2023-119440
Fabien Royer - Cornell University
Sergio Pellegrino - California Institute of Technology

3:03PM
Extraction of the Complete Underlying NiTi Response: Experiments and Numerical Implementation
Technical Presentation: IMECE2023-119731
Stelios Kyriakides - The University of Texas
Jacob Greenly - The University of Texas at Austin
Solon Tsipoukis - The University of Texas at Austin
3:24PM

Wrinkle-to-Crease Transformation on Unstable Deformation Path

Technical Presentation: IMECE2023-120097
Dai Okumura - Nagoya University
Tatsuya Ishida - Nagoya University
Seishiro Matsubara - Nagoya University
So Nagashima - Nagoya University

12-07-02: MECHANICAL METAMATERIALS
11/2/2023
4:00PM–5:45PM – ROOM 274

4:00PM

Magneto-Thermomechanically Reprogrammable Mechanical Metamaterials

Technical Presentation: IMECE2023-113341
Bihui Zou - Shanghai Jiao Tong University
Zihe Liang - UM-SJTU Joint Institute, Shanghai Jiao Tong University
Dijia Zhong - UM-SJTU Joint Institute, Shanghai Jiao Tong University
Zhiming Cui - UM-SJTU Joint Institute, Shanghai Jiao Tong University
Kai Xiao - UM-SJTU Joint Institute, Shanghai Jiao Tong University
Shuang Shao - UM-SJTU Joint Institute, Shanghai Jiao Tong University
Jaehyung Ju - UM-SJTU Joint Institute, Shanghai Jiao Tong University

4:21PM

Thermomechanical Architected Materials: Paving the Path to Future Venussian Flights With Vacuum Airships

Technical Presentation: IMECE2023-120224
Fakhreddin Emami - University of South Carolina
Rimah Al-Aridi - University of South Carolina
Mamdud Rahman - University of South Carolina
Andrew Gross - University of South Carolina

4:42PM

A New Family of 3D Auxetic Mechanical Metamaterials With High Resilience and Elastic Hysteresis

Technical Presentation: IMECE2023-119655
Tiantian Li - Northeastern University
Yaning Li - Northeastern University

5:03PM

Inverse Design of 3D Reconfigurable Curvilinear Modular Origami Structures Using Geometric and Topological Reconstructions

Technical Presentation: IMECE2023-113264
Jaehyung Ju - UM-SJTU Joint Institute, Shanghai Jiao Tong University
Kai Xiao - UM-SJTU Joint Institute, Shanghai Jiao Tong University
Zihe Liang - UM-SJTU Joint Institute, Shanghai Jiao Tong University
Bihui Zou - UM-SJTU Joint Institute, Shanghai Jiao Tong University

5:24PM

Line Waves in Elastic Metamaterials

Technical Paper Publication: IMECE2023-112379
Ankur Dwivedi - University of Exeter
S.A.R. Horsley - University of Exeter
12-08-01: COMMITTEE ON COMPUTING IN APPLIED MECHANICS (CONCAM) DISTINGUISHED LECTURES ON COMPUTATIONAL MECHANICS
11/2/2023
4:00PM–5:45PM – ROOM 275

4:00PM
Multiphysics Modeling of Frontal Polymerization of Thermoset Polymers and Composites: Part 1
Technical Presentation: IMECE2023-119874
Philippe Geubelle - University of Illinois at Urbana-Champaign

4:55PM
Predictive Modeling for Cardiovascular Diseases: Where the Rubber Hits the Road. Part 1
Technical Presentation: IMECE2023-119930
Hoda Hatoum - Michigan Technological University

5:20PM
Predictive Modeling for Cardiovascular Diseases: Where the Rubber Hits the Road. Part 2
Technical Presentation: IMECE2023-119933
Hoda Hatoum - Michigan Technological University

12-08-02: COMMITTEE ON COMPUTING IN APPLIED MECHANICS (CONCAM) DISTINGUISHED LECTURES ON COMPUTATIONAL MECHANICS
11/2/2023
4:00PM–5:45PM – ROOM 277

4:00PM
Technical Presentation: IMECE2023-119591
Yongjie Jessica Zhang - Carnegie Mellon University

4:28PM
Technical Presentation: IMECE2023-119592
Yongjie Jessica Zhang - Carnegie Mellon University

4:55PM
Physics-Based Finite Element and Data-Driven Modeling of Composites: Part I
Technical Presentation: IMECE2023-120168
Maryam Shakiba - University of Colorado Boulder
Reza Sepasdar - Virginia Tech

5:20PM
Physics-Based Finite Element and Data-Driven Modeling of Composites: Part II
Technical Presentation: IMECE2023-120352
Maryam Shakiba - University of Colorado Boulder
Marwa Yacouti - University of Colorado Boulder
TECHNICAL SESSIONS

12-21-02: INSTABILITIES IN SOLIDS
AND STRUCTURES
11/2/2023
4:00PM–5:45PM – ROOM 279

4:00PM
Prediction of Instabilities in Periodic Architected Materials to Actively Modify Wave Propagation Properties
Technical Presentation: IMECE2023-119953
Rachel Azulay - Arts et Metiers Institute of Technology
Christelle Combescure - Military Academy of Saint Cyr

5:03PM
Crushing of a Closed-Cell Polymeric Foam Under Triaxial Loading
Technical Presentation: IMECE2023-119785
Stelios Kyriokides - The University of Texas
Joe Skeens - The University of Texas at Austin

5:24PM
Multiple Equilibrium States of a Curved-Sided Hexagram: Elastic Stability and State Transitions
Technical Presentation: IMECE2023-120055
Lu Lu - Stanford University
Jize Dai - Stanford University
Sophie Leanza - Stanford University
John W. Hutchinson - Harvard University
Ruike Renee Zhao - Stanford University

12-02-03: MODELING OF THE FRACTURE, FAILURE, AND FATIGUE IN SOLIDS
11/2/2023
4:00PM–5:45PM – ROOM 280

4:00PM
Peridynamic Modeling of Dynamic Brittle Fracture Across an Interface and Around Perforations
Technical Presentation: IMECE2023-120347
Florin Bobaru - University of Nebraska-Lincoln
Longzhen Wang - University of Nebraska-Lincoln
Ziguang Chen - Huazhong University of Science and Technology
4:23PM
Peridynamic Model for Discrete Dislocation Dynamics Problems: Plasticity and Fracture
Technical Presentation: IMECE2023-119984
Florin Bobaru - University of Nebraska-Lincoln
Ziguang Chen - Huazhong University of Science and Technology
Wenbo Dong - Huazhong University of Science and Technology
Minsheng Huang - Huazhong University of Science and Technology

4:46PM
Peridynamics and Classical Fracture Mechanics
Technical Presentation: IMECE2023-120258
Stewart Silling - Sandia National Laboratories

5:22PM
Curvature Limiting Sprain Energy: Computational Leapfrog Smoothing the Crack Band Model
Technical Presentation: IMECE2023-113861
Zdenek Bazant - Northwestern University
Houlin Xu - Northwestern University
Anh Nguyen - Northwestern University
A. Abdullah Dönmez - Northwestern University

ACKNOWLEDGMENT

TRACK ORGANIZERS
Track Organizer: Uttam Chakravarty, The University of New Orleans
Track Co-Organizer: Annie Xian Zhang
Track Co-Organizer: In-Hyouk Song, Texas State University

TOPIC ORGANIZERS:
Ahsan Mian, Wright State University
Ali Ashraf, The University of Texas Rio Grande Valley
TECHNICAL SESSIONS

Amir Moghadam
Byungki Kim, Korea University of Technology and Education
Chang-Chun Lee, National Tsing Hua University
Daniel Kaplan, U.S. Army DEVCOM Armaments Center
Devanda Lek
Grzegorz Hader, U.S. Army DEVCOM Armaments Center
Heechang Alex Bae, Eastern Washington University
In-Hyouk Song, Texas State University
Ioana Voiculescu, The City College of New York
Istemi Ozsoy, Embry-Riddle Aeronautical University
Jalal Ahamed
Jeong Ok
Luis Fonseca, Universitat Autònoma de Barcelona
Mehdi Salek, ETH Zurich
Meng-Kai Shih
Namwon Kim, Texas State University
Nathan Jackson, The University of New Mexico
Nazmul Islam, The University of Texas Rio Grande Valley
Po-Hao Huang, University of Arkansas
Pratik Sarker, Embry-Riddle Aeronautical University
Seyedhamidreza Alaie, New Mexico State University
Uttam Chakravarty, The University of New Orleans
Wei Xue, Rowan University

SESSION CHAIRS:

Ahsan Mian, Wright State University
Ali Ashraf, The University of Texas Rio Grande Valley
Byungki Kim, Korea University of Technology and Education
Chang-Chun Lee, National Tsing Hua University
Daniel Kaplan, U.S. Army Combat Capabilities Development Command, Armaments Center
Devanda Lek, Texas State University
Grzegorz Greg Hader, U.S. Army DEVCOM-AC
Heechang Alex Bae, Eastern Washington University
In-Hyoek Song, Texas State
Ioana Voiculescu, The City College of New York
Jeong Tae Ok, Shawnee State University
**TECHNICAL SESSIONS**

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

**MONDAY, OCTOBER 30**

**13-13-01: SIMULATIONS OF MATERIAL MODELING AND BEHAVIOR ANALYSIS FOR MEMS APPLICATIONS**  
**10/30/2023**  
**10:45AM–12:30PM – ROOM 276**

10:45AM  
Electronic Packaging Interfacial Strength Measurement, Thermal-Moisture Induced Delamination Investigation and Structure Design Optimization  
Technical Presentation: IMECE2023-112885  
Mengkai Shih - National Formosa University  
Guan-Sian Lin - National Formosa University  
Eddie Hsu - Richtek Technology Corporation  
Jonny Yang - Richtek Technology Corporation  

11:06AM  
Numerical Investigation of Effective Parameters for Demolding of Nano Imprint Lithography (NIL) and Micro Injection Molding (μIM) of Poly Methyl Methacrylate (PMMA) Microdevices  
Technical Presentation: IMECE2023-114599  
Mohammad Derikvand - Louisiana State University  
Sunggook Park - Louisiana State University  
Steven A. Soper - The University of Kansas  
Michael C. Murphy - Louisiana State University  

11:27AM  
Tensile and Fatigue Response of Steel Parts Fabricated by the Additive Friction-Stir Deposition Process  
Technical Paper Publication: IMECE2023-113564  
Chowdhury Sadid Alam - Louisiana Tech University  
Radif Uddin Ahmed - Louisiana Tech University  
M. Shafiqur Rahman - Louisiana Tech University  

11:48AM  
A Comparative Study on Conductive Polyimide Composite Thin Films Containing Indium-Tin-Oxide and Silver Nanoparticles  
Technical Paper Publication: IMECE2023-113199  
Zeynel Guler - The University of New Mexico  
Nathan Jackson - The University of New Mexico  

12:09PM  
Characteristics of Input Signal of a XY and YX Cut LiNbO3 SAW Using Finite Element Modeling  
Technical Paper Publication: IMECE2023-110762  
Ranjith Janardhana - The University of New Mexico  
Nathan Jackson - The University of New Mexico
13-07-01: Packaging Technology in Heterogeneous Integration Applications & 13-12-01: MEMS Based Electrochemical Sensors in Biomedical Applications
10/30/2023
10:45AM–12:30PM – ROOM 277

10:45AM
Finite Element Analysis and Fatigue Life Prediction of a Laterally Conducting GaN-Based Power Package Under Thermal Cycling
Technical Paper Publication: IMECE2023-111682
Pouria Zaghari - North Carolina State University
Sourish S. Sinha - North Carolina State University
Jong Ryu - North Carolina State University
Paul D. Franzon - North Carolina State University
Douglas Hopkins - North Carolina State University

11:06AM
Integration of Printed Circuit Board (PCB) Interface to Quartz Crystal Microbalance (QCM) for Gas Adsorption Testbed
Technical Paper Publication: IMECE2023-112176
Thi Kieu Ngan Pham - University of Hawaii at Manoa
Matthew Nakamura - University of Hawaii at Manoa
Joseph Brown - University of Hawaii at Manoa

11:27AM
In-Vitro Detection of tRNA Fragments (tRFs) Using an Inkjet-Printed Graphene Electrochemical Aptasensor
Technical Presentation: IMECE2023-111975
Musa Mannan - Texas State University
Hong-Gu Kang - Texas State University
Yihong Maggie Chen - Texas State University
Gwan-Hyoung Lee - Seoul National University
Namwon Kim - Texas State University

11:48AM
A Three-Electrode Three-Dimensional Impedance-Based Biochemical Sensor for Food Safety Applications
Technical Paper Publication: IMECE2023-116977
Athena Zamiri - Southern Illinois University Edwardsville
Mohammad Shavezipur - Southern Illinois University Edwardsville

10/30/2023
2:00PM–3:45PM – ROOM 276

2:00PM
Structural Analysis of Additively Manufactured Polymeric Auxetic Metamaterials
Technical Paper Publication: IMECE2023-113839
Gazi Raihan - The University of New Orleans
Uttam Chakravarty - The University of New Orleans

2:21PM
An Investigation on the Aerodynamic Characteristics of An Electroactive Membrane
Technical Paper Publication: IMECE2023-113491
Oluwatosin Ojo - The University of New Orleans
Ji Su - NASA Langley Research Center
Uttam Chakravarty - The University of New Orleans

2:42PM
An Investigation of the Mechanical Properties of a Soft Metamaterial
Technical Paper Publication: IMECE2023-114080
Walter Loop - The University of New Orleans
Ji Su - NASA Langley Research Center
Uttam Chakravarty - The University of New Orleans
3:03PM

Dynamic Analysis of a Cracked Composite Beam

Technical Paper Publication: IMECE2023-113709
Pratik Sarker - Embry-Riddle Aeronautical University
Uttam K. Chakravarty - The University of New Orleans

3:24PM

Design Optimization of Piezoresistive Pressure Sensors for MEMs Applications

Technical Presentation: IMECE2023-115004
Awlad Hossain - Eastern Washington University
Ahsan Mian - Wright State University

2:00PM–3:45PM – ROOM 277

13-08-01: ENERGY HARVESTING AND STORAGE & 13-09-01: ADVANCED MANUFACTURING OF MICROSYSTEMS, MICROSTRUCTURES, AND MINIATURIZED ACTUATORS

2:00PM

Comparative Electrode Design for Piezoelectric MEMS Kinetic Energy Harvester

Technical Paper Publication: IMECE2023-111722
Ranjith Janardhana - The University of New Mexico
Nathan Jackson - The University of New Mexico

2:21PM

Passive Frequency Tuning Using Liquid Distributed Load

Technical Paper Publication: IMECE2023-113197
Rahul Adhikari - The University of New Mexico
Vahid Karimi - The University of New Mexico
Nathan Jackson - The University of New Mexico

2:42PM

An Improved Method for Determining the Thermal Conductivity of Supported Nanomaterials Using the Optothermal Raman Technique and Uses for Stress-Strain Dependence Measurements

Technical Presentation: IMECE2023-120334
Micah Vallin - University of North Texas/Los Alamos National Laboratory
Michael Pettes - Los Alamos National Laboratory
Richard Zhang - University of North Texas

3:03PM

Selective Etching Cu on Nitinol Wires and Its Effect on the Chemical and Elastic Properties of Nitinol

Technical Presentation: IMECE2023-120344
Hemanta Dulal - New Mexico State University
Seyedhamidreza Alaie - New Mexico State University

3:24PM

A Cost-Effective Environmental Chamber for Characterization of Microfabricated Devices Using Ultrasound in Aqueous Environments at Various Pressures

Technical Presentation: IMECE2023-120339
Seyedhamidreza Alaie - New Mexico State University
Subhi Al'aref - University of Arkansas for Medical Sciences
13-06-02: A P p l i e d M e c h a n i c s a n d M a t e r i a l s i n M i c r o- 
and Nano-Systems II
10/30/2023
4:00PM–5:45PM – Room 276

4:00PM
Multiscale Surface Force Models for Adhesive Metasurfaces
Technical Paper Publication: IMECE2023-112720
Corissa Heyes - University of Hawaii at Manoa
Joseph Brown - University of Hawaii at Manoa

4:21PM
Effects of Cooling Rate on the Stress-Strain Behavior of SAC305 Solder: An Atomistic Study
Technical Paper Publication: IMECE2023-114426
Sadib Fardin - Bangladesh University of Engineering and Technology
Md Jawarul Moresalein - Bangladesh University of Engineering and Technology
Mohammad Motalab - Bangladesh University of Engineering and Technology

4:42PM
Mechanical Properties of Stretchable Multifunctional Ecoflex Composites for E-Skin Applications
Technical Paper Publication: IMECE2023-117258
Zeynel Guler - The University of New Mexico
Nathan Jackson - The University of New Mexico

5:03PM
High-G Survivable Three-Axis Mems Accelerometer
Technical Paper Publication: IMECE2023-113784
Grzegorz (Greg) Hader - U.S. Army DEVCOM Armaments Center
Jeffrey Smyth - U.S. Army DEVCOM Armaments Center

13-10-01: M i c r o f l u i d i c s 2023
10/30/2023
4:00PM–5:45PM – Room 277

4:00PM
Design, Fabrication, and Evaluation of an Inertial Flow Microfluidic Device for Bacterial Characterization
Technical Presentation: IMECE2023-114672
Shaurya Prakash - The Ohio State University
Kevin Lei - The Ohio State University

4:21PM
Experimental Estimation and Validation of Disjoining Pressure of Water
Technical Presentation: IMECE2023-120134
An Zou - Syracuse University
Sajag Poudel - Syracuse University
Manish Gupta - Syracuse University
Shalabh Maroo - Syracuse University
4:42PM

Effect of EIS in a 3D Printed Non-Planer Array Patterned Microfluidic Devices

Technical Paper Publication: IMECE2023-111762
Shanzida Kabir - The University of Texas Rio Grande Valley
Hector Zepeda Saenz - The University of Texas Rio Grande Valley
Nazmul Islam - The University of Texas Rio Grande Valley

5:03PM

Separation of CTCs From Blood Cells Using Curved Contraction-Expansion Microchannel Equipped With DEP Force

Technical Paper Publication: IMECE2023-112803
Md Tanbir Sarowar - Washington State University Vancouver
Md Sadiqul Islam - Purdue University
Xiaolin Chen - Washington State University Vancouver

5:24PM

Investigation of Off-Centered Impact of Droplet on a Single Microhole

Technical Paper Publication: IMECE2023-112877
Sakib Sadat Shondhi - Washington State University Vancouver
Nur Alam - Washington State University Vancouver
Hua Tan - Washington State University Vancouver

TUESDAY, OCTOBER 31

10:15AM

Study of Off-Axis Translocation of DNMPs Through In-Plane Nanopores by 3D Comsol Simulation

Technical Presentation: IMECE2023-112332
Junseo Choi - Louisiana State University
Sunggook Park - Louisiana State University

10:36AM

Using Image Processing to Estimate Wound Area Post-Electroceutical Treatment of Chronic Dermal Injury

Technical Presentation: IMECE2023-113047
Colin Mack - The Ohio State University
Rachel Heald - The Ohio State University
Daria Bentley - The Ohio State University
Shaurya Prakash - The Ohio State University

10:57AM

Developing a Portable Nitrous Oxide Liquefying System for Cryoablation

Technical Presentation: IMECE2023-119776
Hailei Wang - Utah State University

11:18AM

Study of the Water-Responsive Material Strain With Piezoelectric Sensor

Technical Paper Publication: IMECE2023-111928
Shuo Fang - The City College of New York
Xi Chen - The City College of New York
Ioana Voiculescu - City College of New York
TECHNICAL SESSIONS

**13-05-01: MICRO AND NANO DEVICES**

**10/31/2023**

10:15AM–12:00PM – ROOM 288

**WE Extremely Durable Superhydrophobic Surface**

Technical Presentation: IMECE2023-120209

Durgesh Ranjan - Syracuse University

Shalabh Maroo - Syracuse University

An Zou - Syracuse University

10:36AM

**Phase Interface Dynamics and Heat Transfer for Subcooled Impacting Droplets on a Heated MEMs Microdevice**

Technical Presentation: IMECE2023-120006

Md Tanbin Hasan Mondal - Louisiana Tech University

Md Shafayet Alam - Louisiana Tech University

Rifat-E-Nur Hossain - Louisiana Tech University

Arden Moore - Louisiana Tech University

10:57AM

**Investigation of Transverse-Electric (TE) and Transverse-Magnetic (TM) Laser Modes in Hybrid Metal Optical Microlasers**

Technical Paper Publication: IMECE2023-112834

Md Nazmus Sakib - University of North Texas

Maurizio Manzo - University of North Texas

11:18AM

**In-Situ Shear Exfoliation of Graphene From Graphite Polymer Nanocomposites for Lung and Heart Motion**

Technical Paper Publication: IMECE2023-113676

Md Ashiqur Rahman - The University of Texas Rio Grande Valley

Md. Abdur Rahman Bin Abdus Salam - The University of Texas Rio Grande Valley

Ali Ashraf - The University of Texas Rio Grande Valley

**13-04-02: APPLICATIONS OF MICRO AND NANO SYSTEMS IN MEDICINE AND BIOLOGY II**

**10/31/2023**

2:00PM–3:45PM – ROOM 280

2:00PM

**Piezoelectric Blood Pressure Sensor for Implantable Devices**

Technical Paper Publication: IMECE2023-112273

Bright Katey - Virginia Polytechnic Institute and State University

Ioana Voiculescu - The City College of New York

Fang Li - New York Institute of Technology

Alexandrina Untaruoi - Virginia Polytechnic Institute and State University

Muhammad Mubashar Ashraf - Virginia Polytechnic Institute and State University

2:21PM

**Evaluation of Myotubes Orientation Cultured on Scaffold Film by Micromarkers Matrix**

Technical Paper Publication: IMECE2023-112503

Shigehiro Hashimoto - Kogakuin University

Shusei Sakai - Kogakuin University

Shunsuke Saito - Kogakuin University
TECHNICAL SESSIONS

2:42PM

Deformation of Cells Passing Through Gaps Between Microcylinders in Channel
Technical Paper Publication: IMECE2023-112515
Shigehiro Hashimoto - Kogakuin University
Shogo Uehara - Kogakuin University
Kota Yamamoto - Kogakuin University

3:03PM

Graphene Nanoparticle Modified Laser Engraved Kapton Sensor for Environmental Estrogen Detection
Technical Paper Publication: IMECE2023-114031
Dipannita Ghosh - University of Texas Rio Grande Valley
Saydur Rahman - University of Texas Rio Grande Valley
Ali Asharf - University of Texas Rio Grande Valley
Nazmul Islam - University of Texas Rio Grande Valley

13-03-01: COMPUTATIONAL STUDIES ON MEMS AND NANOSTRUCTURES
10/31/2023
2:00PM–3:45PM – ROOM 288

2:00PM

Parametric Study on the Nanoparticle Focusing in Thermophoresis Microfluidic Devices
Technical Paper Publication: IMECE2023-113968
Guanyang Xue - Lehigh University
Justin Caspar - Lehigh University
Xuanhong Cheng - Lehigh University
Alparslan Oztekin - Lehigh University

2:42PM

Design and Analysis of a Quantum Graphene Gyroscope
Technical Presentation: IMECE2023-113393
Aron Cummings - Catalan Institute of Nanoscience and Nanotechnology
Grzegorz Hader - U.S. Army DEVCOM Armaments Center
Eui-Hyeok Yang - Stevens Institute of Technology

3:03PM

Design of Photonic Crystals for Nanokelvin-Resolution Thermometry
Technical Presentation: IMECE2023-119324
Amin Reihani - Rutgers University

3:24PM

Electromechanically Reconfigurable Plasmonic Nanogap Cantilevers
Technical Presentation: IMECE2023-120110
Hyeong Seok Yun - Carnegie Mellon University
Xiu Liu - Carnegie Mellon University
Hakan Salihoglu - Carnegie Mellon University
Zhuo Li - Carnegie Mellon University
Sheng Shen - Carnegie Mellon University
13-02-01: Design and Fabrication, Analysis, Processes, and Technology for Micro and Nano Devices and Systems
10/31/2023
4:00PM–5:45PM – Room 280

4:00PM
Aharonov-Bohm Oscillations in Chemical Vapor Deposition-Grown Graphene Rings and Ribbons
Technical Presentation: IMECE2023-114208
Zitao Tang - Stevens Institute of Technology
Siwei Chen - Stevens Institute of Technology
Abdus Salam Sarkar - Stevens Institute of Technology
Cynthia Osuala - Stevens Institute of Technology
Stephan Strauf - Stevens Institute of Technology
Grzegorz Hader - U.S. Army DEVCOM Armaments Center
Aron Cummings - Catalan Institute of Nanoscience and Nanotechnology
Chunlei Qu - Stevens Institute of Technology
Eui-Hyeok Yang - Stevens Institute of Technology

4:21PM
Design and Manufacturing of a Modular, Mixed-Scale Fluidic System With a Universal Fluidic Motherboard and Modules for Molecular Assays
Technical Presentation: IMECE2023-114288
Daniel Park - Louisiana State University
Malgorzata Witek - The University of Kansas
Byoung Hee You - Texas State University
Mateusz Hupert - BioFluidica, Inc.
Steven Soper - The University of Kansas
Michael Murphy - Louisiana State University

4:42PM
Design of Capacitive Micromachined Ultrasonic Transducers (CMUTs) for Enhanced Mass-Loading Effect Resonant Sensing
Technical Presentation: IMECE2023-120238
Kendalle Howard - Texas State University
Sangchul Hwang - Texas State University
Byoung Hee You - Texas State University
In-Hyouk Song - Texas State University

5:03PM
Dielectric and Mechanical Characteristics of Polyamide-Silicon Dioxide Nanocomposites
Technical Paper Publication: IMECE2023-113011
Nicholas R. Mahon - Rowan University
Jared Ericksen - Rowan University
Sean F. Lawton - Rowan University
Max P. Coraggio - Rowan University
John P. Terifay - Rowan University
Michael Smith - Rowan University
Diana Martinez-Castro - Rowan University
Paul M. Maienza - Rowan University
Wei Xue - Rowan University

5:24PM
Novel Polysulfone-Iron Acetate Nanocomposite Membrane for Oil/Water Separation
Technical Presentation: IMECE2023-118710
Husain Alfadhel - Ministry of Public Works, Kuwait
Track 14: Safety Engineering, Risk, and Reliability Analysis

Topics:
14-1: General Topics on Risk, Safety, and Reliability
14-2: Reliability and Risk in Energy Systems
14-3: Reliability and Safety in Industrial Automation Systems
14-4: Reliability and Safety in Transportation Systems
14-5: Models and Methods for Probabilistic Risk Analysis
14-6: Machine Learning and Deep Learning in Safety, Reliability, and Maintenance
14-7: Crashworthiness, Occupant Protection, and Biomechanics
14-8: Congress-Wide Symposium on Prognostic and Health Management: NDE and Prognostics of Structures and Systems
14-9: Users, Technology, and Human Reliability in Safety Engineering
14-10: Developments in Design Theory for Component and System Safety and Reliability
14-11: Student Safety Innovation Challenge

ACKNOWLEDGMENT

Track Organizers
Track Organizer: William Paul Munsell, Jr., University of Oklahoma
Track Co-Organizer: Mihai A. Diaconeasa, North Carolina State University

TOPIC ORGANIZERS:

Akram Batikh
Andrey Morozov, University of Stuttgart
Bahadir Karba
Bill Munsell
Egemen Aras
Joachim Grimstad
John Homer

SESSION CHAIRS:

Arjun Earthperson, North Carolina State University
Jiaze He, The University of Alabama
Mihai Diaconeasa, North Carolina State University
Shweta Dabetwar
William Munsell, Munsell Consulting Services
Yahya Alzahrani, North Carolina State University
TECHNICAL SESSIONS

TRACK 14: SAFETY ENGINEERING, RISK, AND RELIABILITY ANALYSIS

MONDAY, OCTOBER 30

14-08-01: USERS, TECHNOLOGY, AND HUMAN RELIABILITY IN SAFETY ENGINEERING
10/30/2023
10:45AM–12:30PM – ROOM 279

10:45AM
Current Efforts to Rewrite the History of the Safety Hierarchy and Obviate Its Purpose
Technical Paper Publication: IMECE2023-113870
William Munsell - Munsell Consulting Services

11:06AM
Application of Sensor Technology for Firearm Safety Mechanism Reducing Human Errors
Technical Presentation: IMECE2023-118631
Masato Nakamura - New York City College of Technology

11:27AM
Health, Safety, and Environment Policy in an Organization
Technical Presentation: IMECE2023-116349
Anurag Gupta - Oil India Limited
Pankaj Kumar Goswami - Oil India Limited

11:48AM
Concerns With Risk Distribution in Environmental Justice
Technical Paper Publication: IMECE2023-114497
Kevin Nelson - Unaffiliated
Ernest Kee - University of Illinois at Urbana-Champaign

12:09PM
Engineering and Environmental Justice: Protections, Hazards, and Technological Systems
Technical Paper Publication: IMECE2023-111783
Riley Fisher - University of Illinois at Urbana-Champaign
Ernest Kee - University of Illinois at Urbana-Champaign
David Johnson - unaffiliated
Ha Bui - University of Illinois at Urbana-Champaign
Zahra Mohageghegh - University of Illinois at Urbana-Champaign

14-01-02: GENERAL TOPICS ON RISK, SAFETY, AND RELIABILITY
10/30/2023
10:45AM–12:30PM – ROOM 278

10:45AM
Slips, Trips, and Falls Associated With Floor Mats and Runners
Technical Paper Publication: IMECE2023-114028
Eugenia Kennedy - Exponent
Michelle Chen - Exponent
Mark Guttag - Consultant

11:06AM
A Performance-Based Reliability Approach
Technical Paper Publication: IMECE2023-112447
Diego Mandelli - Idaho National Laboratory
Congjian Wang - Idaho National Laboratory

11:27AM
Adjoint Tomography Theory Based Reverse-Time Migration Defect Imaging Through Impedance Gradient
Technical Presentation: IMECE2023-119657
Jiaze He - The University of Alabama
John Day - The University of Alabama
Jeffrey Shragge - Colorado School of Mines
11:48AM

A Comparative Study on Battery Remaining Useful Life Prediction Models

Technical Presentation: IMECE2023-111552
David Najera-Flores - University of California, San Diego
Zhen Hu - University of Michigan-Dearborn
Mayank Chadha - University of California, San Diego
Michael Todd - University of California, San Diego

14-01-01: RELIABILITY AND SAFETY IN TRANSPORTATION SYSTEMS
10/30/2023
2:00PM–3:45PM – ROOM 278

2:00PM

Vibration Anomaly Detection by Clustering in Unmanned Aerial Vehicles

Technical Presentation: IMECE2023-120008
Portia Banerjee - NASA Ames Research Center
Rajeev Ghimire - NASA Ames Research Center

2:21PM

Global Sensitivity Analysis Method for Model-Based System Safety Assessment on Aviation Piston Engine

Technical Paper Publication: IMECE2023-112737
Guo Li - Beihang University
Yida Teng - Beihang University
Tongge Xu - Beihang University
Zilu Wang - Beihang University
Shuiting Ding - Civil Aviation University of China

2:42PM

Real Time Tire Wear Detection Using Intelligent Tires

Technical Paper Publication: IMECE2023-112423
Utkarsh Gupta - Virginia Tech
Anish Gorantiwar - Virginia Tech
Saied Taheri - Virginia Tech

3:03PM

Review of the Reliability and Feasibility of Existing Databases for Automated Vehicle Safety

Technical Paper Publication: IMECE2023-112186
Eun Young Kim - George Mason University
Duminda Wijesekera - George Mason University
Cing-Dao Kan - George Mason University
Chung-Kyu Park - George Mason University

14-02-01: MODELS AND METHODS FOR PROBABILISTIC RISK ANALYSIS
10/30/2023
4:00PM–5:45PM – ROOM 278

4:00PM

Probabilistic Risk Assessment Study for Uncertainty Quantification of Spent Pebble-Bed Dry Cask Storage System Operation

Technical Paper Publication: IMECE2023-117024
Joomyung Lee - North Carolina State University
Mostafa M. Hamza - North Carolina State University
Havva Tayfur - North Carolina State University
Yahya Alzahrani - North Carolina State University
Mihai Diaconeasa - North Carolina State University

4:21PM

Introducing OpenPRA: A Web-Based Framework for Collaborative Probabilistic Risk Assessment

Technical Paper Publication: IMECE2023-111708
TUESDAY, OCTOBER 31

14-02-02: RELIABILITY AND RISK IN ENERGY SYSTEMS
10/31/2023
10:15AM–12:00PM – ROOM 289

10:15AM
Dependency of the Blast Wave Characteristics on the Rupture Mode of a Failed Pneumatic Test of a Pipe Segment
Technical Paper Publication: IMECE2023-111159
Kamal Botros - NOVA Chemicals
Andrew Hawryluk - NOVA Chemicals
Eric Clavelle - NOVA Chemicals
Michael Martens - TC Energy

10:36AM
Implementation Risk Indicator and Application of Reliability Management to Ensure the Success of LCM and Risk Management Integration
Technical Paper Publication: IMECE2023-110981
Didi Rooscote - PT PLN Indonesia Power
Danianto Hendragiri - PLN Indonesia Power
Agung Suharwanto - PLN Indonesia Power

10:57AM
Challenges of Purging Air With Natural Gas and Hydrogen Blends in Pipe Segments
Technical Paper Publication: IMECE2023-111150
Kamal K. Botros - Nova Husky Res Corp
Colin Hill - Think Solutions
Paul Ziade - Think Solutions
Craig Johansen - Think Solutions
Greg Van Boven - TC Energy

4:42PM
Technical Paper Publication: IMECE2023-114319
Molly Prins - North Carolina State University
Thomas O’Connell - North Carolina State University
Yahya Alzahrani - North Carolina State University
Mihai Diaconeasa - North Carolina State University

5:03PM
Leveraging Probabilistic Risk Assessment and Machine Learning for Safety and Cost Optimization in Hazmat Transportation
Technical Paper Publication: IMECE2023-114273
Molly Prins - North Carolina State University
Thomas O’Connell - North Carolina State University
Arjun Earthperson - North Carolina State University
Yahya Alzahrani - North Carolina State University
Mihai Diaconeasa - North Carolina State University

5:24PM
STPA Analysis of a Redundant Process Controllers in a Neutron Beam System in a Generic Nuclear Research Reactor
Technical Presentation: IMECE2023-110677
Liran Bar-Or - NRC-Negev
Daniel Hartmann - Freelance

Arjun Earthperson - North Carolina State University
Egemen M. Aras - North Carolina State University
Asmaa S. Farag - North Carolina State University
Mihai A. Diaconeasa - North Carolina State University

OCTOBER 29 – NOVEMBER 2, 2023

EVENT.ASME.ORG/IMECE

INTERNATIONAL MECHANICAL ENGINEERING CONGRESS & EXPOSITION
ONE GREAT LEARNING EXPERIENCE.
INTERNATIONAL MECHANICAL ENGINEERING CONGRESS & EXPOSITION
<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Technical Paper Publication ID</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>11:18AM</td>
<td>Construction of a Strain-Based Bayesian Network for Assessing Pipeline Risk due to Ground Movement</td>
<td>IMECE2023-113465</td>
<td>Colin Schell - University of Maryland, College Park</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Ernest Lever - GTI Energy</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Katrina Groth - University of Maryland, College Park</td>
</tr>
<tr>
<td>2:00PM</td>
<td>Application of Sparse Estimation for Best Estimate Plus Uncertainty Analysis of a Small Break LOCA in PWRs</td>
<td>IMECE2023-111094</td>
<td>Ikuo Kinoshita - Institute of Nuclear Safety System, Inc.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Akhilesh Jain - SparkCognition</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Michael Aman - SparkCognition</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Kevin Gullikson - SparkCognition</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Nkem Egboga - SparkCognition</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Marcus Horton - SparkCognition</td>
</tr>
<tr>
<td>2:42PM</td>
<td>Application of Sparse Estimation for Best Estimate Plus Uncertainty Analysis of a Small Break LOCA in PWRs</td>
<td>IMECE2023-111094</td>
<td>Ikuo Kinoshita - Institute of Nuclear Safety System, Inc.</td>
</tr>
<tr>
<td>3:03PM</td>
<td>Towards the Development of Material-Systems Intelligence</td>
<td>IMECE2023-119889</td>
<td>Christopher Rudolf - U.S. Naval Research Laboratory</td>
</tr>
<tr>
<td>2:00PM</td>
<td>Machine Learning Based Search for Access Points in Anomaly Detection Model</td>
<td>IMECE2023-113438</td>
<td>Vishnu Gangadhara Naik - University of Stuttgart</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Tagir Fabariso - University of Stuttgart</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Andrey Morozov - University of Stuttgart</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Fatih Karpat - Bursa Uludag University</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Esin Karpat - Bursa Uludag University</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Ahmet Emir Dirik - Bursa Uludag University</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Stephen Ekwaro-Osire - Texas Tech University</td>
</tr>
<tr>
<td>3:03PM</td>
<td>Towards the Development of Material-Systems Intelligence</td>
<td>IMECE2023-119889</td>
<td>Christopher Rudolf - U.S. Naval Research Laboratory</td>
</tr>
<tr>
<td>2:00PM</td>
<td>Machine Learning Based Search for Access Points in Anomaly Detection Model</td>
<td>IMECE2023-113438</td>
<td>Vishnu Gangadhara Naik - University of Stuttgart</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Tagir Fabariso - University of Stuttgart</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Andrey Morozov - University of Stuttgart</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Fatih Karpat - Bursa Uludag University</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Esin Karpat - Bursa Uludag University</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Ahmet Emir Dirik - Bursa Uludag University</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Stephen Ekwaro-Osire - Texas Tech University</td>
</tr>
<tr>
<td>4:00PM</td>
<td>Uncertainty of Thermodynamic-Entropy-Based Reliability and Remaining Useful Life Predictions Under Variable Amplitude Fatigue</td>
<td>IMECE2023-114109</td>
<td>Lance R. Curtis - University of Maryland</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Bilal M. Ayyub - University of Maryland</td>
</tr>
</tbody>
</table>
4:21PM

Numerical Analysis on Buckling of Ultrahigh Strength Steel Wheel

Technical Paper Publication: IMECE2023-112381
Jintao Luo - Beihang University
Zhengwen Li - Beihang University
Yingchun Shan - Beihang University
Xiaodong Liu - Beihang University
Yizhuo Wang - Beihang University
Erjiang - Xingmin Intelligent Transportation Systems (Group) Co.

4:42PM

Uncertainty Quantification in the Prediction of Remaining Useful Life Considering Multiple Failure Modes

Technical Paper Publication: IMECE2023-114086
Nazir Gandur - Texas Tech University
Stephen Ekwaro-Osire - Texas Tech University

5:03PM

Effects of Thermal Mechanical Fatigue on a 2.2Cr-1Mo Steam Header

Technical Paper Publication: IMECE2023-109395

Michael Zimnoch - The University of North Carolina at Charlotte
Elnaz Haddadi - The University of North Carolina at Charlotte
Ian Perrin - The University of North Carolina at Charlotte
Alireza Tabarraei - The University of North Carolina at Charlotte

Track 15: ASME International Undergraduate Research and Design Exposition

Track Organizer: Mohsen Ghamari, Wilkes University

Track 16: National Science Foundation

Track Organizer: Siddiq Qidwai
Dumitru Caruntu, University of Texas-Rio Grande Valley
Marriner Merrill
Po-Hao Adam Huang

Track 17: Research Posters

Track Organizer: Omid Askari, West Virginia University
Reuben Kraft, Penn State
Track Posters
TRACK 15: IMECE Undergraduate Research and Design Exposition

Track Organizer: Mohsen Ghamari – Wilkes University

IMECE Undergraduate Research and Design Exposition
10/29/2023
5:30PM–7:00PM - Exhibit Hall G

U1. Fresh Whole Blood Transfusion in Austere Environments - Warming Devices
Undergraduate Expo: IMECE2023-111927
Andrea Riddle - United States Military Academy
Drew Homan - United States Military Academy
Ludvig Emerick - United States Military Academy
Emine Foust - United States Military Academy
Andrew Banko - United States Military Academy
Rakesh Dubey - United States Military Academy

U2. Fluid Friction Dynamometer Senior Design
Undergraduate Expo: IMECE2023-113536
Andrew Jennings - Northern Michigan University
Seth Norberg - Northern Michigan University
Kollen Jansma - Northern Michigan University
Jaden Knapp - Northern Michigan University
Weilan Larose - Northern Michigan University

U3. The Effect of Heat Treatment on Physical and Mechanical Properties of PCL Flow Diveters
Undergraduate Expo: IMECE2023-114124
Mohammad Hossan - University of Central Oklahoma
Alex Matsayko - University of Central Oklahoma

U4. Impeller Blade Shape Effect on the Centrifugal Pump Performance Analysis
Undergraduate Expo: IMECE2023-114159
Orlando Limousin - Universidad Nacional de Asuncion
Atilio Nuñez - Universidad Nacional de Asuncion
Jose Duarte - Universidad Nacional de Asuncion
Lucas Laconich - Universidad Nacional de Asuncion
Juan Ovelar - Universidad Nacional de Asuncion
Cristhian Quintana - Universidad Nacional de Asuncion
Iván Yerutá - Universidad Nacional de Asuncion
Jorge Kurita - Universidad Nacional de Asuncion

U5. Thermal Performance of Dovetail Fins Under Dehumidifying Operating Conditions – Analytical and Numerical Solutions
Undergraduate Expo: IMECE2023-114189
Pornphiphat Saiboonchan - Texas A&M University Texarkana
Sulaman Pashah - Texas A&M University Texarkana

Undergraduate Expo: IMECE2023-114196
Colton Henry - Texas A&M University Texarkana
Sulaman Pashah - Texas A&M University Texarkana

U7. A Novel Artificial Pancreas System

Undergraduate Expo: IMECE2023-114275
Victor Buitimea - Georgia Southern University
Mohammad Towhidul Islam - Georgia Southern University
Sevki Cesmeci - Georgia Southern University

U8. Experimental Analysis of an Elastohydrodynamic Seal for sCO2 Turbomachinery

Undergraduate Expo: IMECE2023-114302
Jonah Henry - Georgia Southern University
Joshua Bunting - Georgia Southern University
Hanping Xu - Ultool, LLC
Mohammad Fuad Hassan - Georgia Southern University
Mohammad Towhidul Islam - Georgia Southern University
Sevki Cesmeci - Georgia Southern University
Shuangbiao Liu - Ultool, LLC
Aaron Harcrow - Ultool, LLC
Ali Akbor Topu - Georgia Southern University
Md Wasif Hasan - Georgia Southern University
David Dewis - Independent Consultant
Jing Tang - Ultool, LLC


Undergraduate Expo: IMECE2023-114796
Axel Ibañez - Universidad Nacional de Asunción
Santiago Schaerer - Universidad Nacional de Asunción
Veronica Correa - Universidad Nacional de Asunción
Enrique Gimenez - Universidad Nacional de Asunción
Matias Fernandez Ferreira - Universidad Nacional de Asunción
Marcos Lorenzo Vera Bower - Universidad Nacional de Asunción
Jorge Kurita - Universidad Nacional de Asunción

U10. Wind Power Distributed Generation Analysis in Urban Areas: A Case Study

Undergraduate Expo: IMECE2023-114808
Junior Velazquez - Universidad Nacional de Asuncion
Víctor Caballero - Universidad Nacional de Asuncion
Guadalupe Vázquez - Universidad Nacional de Asuncion
Fernando Martinez - Universidad Nacional de Asuncion
Ignacio Martinez - Universidad Nacional de Asuncion
Alejandro Silvero - Universidad Nacional de Asuncion
Yunior Díaz - Universidad Nacional de Asuncion
Jose Leguizamon - Universidad Nacional de Asuncion
Jorge Kurita - Universidad Nacional de Asuncion

TRACK POSTERS
U11. Residual Resistivity Ratio of Niobium and Copper
**Undergraduate Expo: IMECE2023-115192**
Sonya Smith - Howard University
Quentin Taylor - Howard University
Damon Gresham-Chisolm - Howard University

U12. Design of a Small Sized Bulb Turbine Applied to Distributed Hydropower Generation: A Case Study
**Undergraduate Expo: IMECE2023-115200**
Luis Gusto - Universidad Nacional de Asunción
Daniel Figueredo - Universidad Nacional de Asunción
Francisco Gómez - Universidad Nacional de Asunción
Aníbal Díaz - Universidad Nacional de Asunción
Jorge Molinas - Universidad Nacional de Asunción
Liz Esquivel - Universidad Nacional de Asunción
Jorge Kurita - Universidad Nacional de Asunción

U13. Lever-Based String-Driven Wheelchair With Speed Adjustment
**Undergraduate Expo: IMECE2023-113577**
Mahmood Khaja Muhieytheen - Guindy-Anna University
Seshaarajesh S - Guindy-Anna University
Jayanand B. Anna - Guindy-Anna University
Vickneshvari RM - Guindy-Anna University
Shanmuga Sundaram K - Guindy-Anna University
Nirmal AJLA - Guindy-Anna University

U14. Pipe Friction Demonstrator
**Undergraduate Expo: IMECE2023-116538**
Elijah Muxlow - Northern Michigan University
Benjamin Muxlow - Northern Michigan University
Joseph O’Dovero - Northern Michigan University
Seth Norberg - Northern Michigan University

U15. Development of Interactive Teaching Material for Engineering Education
**Undergraduate Expo: IMECE2023-116325**
Sulaman Pashah - Texas A&M University Texarkana
Dustin Higby - Texas A&M University Texarkana

U16. Design, Fabrication, and Analysis of a Modular Braiding Machine for Flow-Diverting Stents
**Undergraduate Expo: IMECE2023-116491**
Mohammad Hossan - University of Central Oklahoma
Zeb Jandt - University of Central Oklahoma

U17. A Novel Methodology for Traditional Aqua-Farming
**Undergraduate Expo: IMECE2023-118495**
Pabba Pavan Kumar - Hyderabad Institute of Technology and Management
Kowdodi Siva Prasad - Hyderabad Institute of Technology and Management
Vanamamala Girdhar - Hyderabad Institute of Technology and Management
Gajalajamgam Yuvaraj - Hyderabad Institute of Technology and Management
U18. Mechanical Behavior and Material Modeling of Additively Manufactured Architectured Lattices: A Comparative Study

Undergraduate Expo: IMECE2023-118722

Kunal Gide - George Mason University
Holly Fulcomer - George Mason University
Shaghayegh Bagheri - George Mason University

U19. Characterization of Biofouling on Thermal Bubble-Driven Micro-Pumps

Undergraduate Expo: IMECE2023-119419

Daimean Solis - University of Colorado Boulder
Brandon Hayes - University of Colorado Boulder
Robert Maccurdy - University of Colorado Boulder


Undergraduate Expo: IMECE2023-119888

Janeth Marquez Rubio - University of Colorado Boulder
Brandon Hayes - University of Colorado Boulder
Robert Maccurdy - University of Colorado Boulder
Cillian Murphy - University of Colorado Boulder, University College Dublin

U21. Development of 3D Printed Humanoid Robots

Undergraduate Expo: IMECE2023-120302

James Van Milligen - Worcester Polytechnic Institute
Emily Austin - Worcester Polytechnic Institute
Zenia Alarcon - Worcester Polytechnic Institute
Aashish Singh Alog - Worcester Polytechnic Institute
Tessa Lytle - Worcester Polytechnic Institute
Josh Fernandez - Worcester Polytechnic Institute
Finbarr O’Sullivan - Worcester Polytechnic Institute
Erin Lee - Worcester Polytechnic Institute
Casey Snow - Worcester Polytechnic Institute
Pradeep Radhakrishnan - Worcester Polytechnic Institute
Kaveh Pahlavan - Worcester Polytechnic Institute

U22. Continuum-Based Particle Model of Bone Morphogenesis Predicts Changes in Tissue Shape and Structure Due to Secondary Ossification

Undergraduate Expo: IMECE2023-120633

Jorik Stoop - Georgia Institute of Technology
Yuka Yokoyama - Kyoto University
Taiji Adachi - Kyoto University

U23. Replating of Carbon Fiber Composites Metallized Through Sacrificial Nanotransfer

Undergraduate Expo: IMECE2023-120878

Iris You - Rutgers University
Bryan Llumiquinga - Rutgers University
Jonathan Singer - Rutgers University
U24. Drag Force Analysis on South American River Fish: A Comparison Case Study

Undergraduate Expo: IMECE2023-113759
Leila Jimenez - Universidad Nacional de Asuncion
Daniel Ailo - Universidad Nacional de Asuncion
Elias Villalba - Universidad Nacional de Asuncion
Ana Leon - Universidad Nacional de Asuncion
Cristian Ortiz - Universidad Nacional de Asuncion
Diego Aquino - Universidad Nacional de Asuncion
Rodrigo Cantero - Universidad Nacional de Asuncion
Jonathan Ramirez - Universidad Nacional de Asuncion
Luis Martinez - Universidad Nacional de Asuncion
Jorge Kurita - Universidad Nacional de Asuncion

U25. Greening the Future: Rice Starch and Corn-Based Adhesives in Biodegradable Composite Production

Undergraduate Expo: IMECE2023-121015
Naveen Durga Prasad Prasad - Jawaharlal Nehru Technological University

U26. Image-Based Quantification and Identification of Live-Dead Cells Following Impact

Undergraduate Expo: IMECE2023-121066
Ashfaq Adnan - The University of Texas at Arlington
Akanksha Subbarao - Coppell High School, Summer Researcher at The University of Texas at Arlington
Raisa Akhtaruzzaman - The University of Texas at Arlington

U27. An Integrated Computational Framework for Process-Informed Analysis of 3D Printed Knee Assembly Components

Undergraduate Expo: IMECE2023-121089
Chloe Shirikjian - University of Massachusetts Dartmouth
Wenzhen Huang - University of Massachusetts Dartmouth
Alfa Heryudono - University of Massachusetts Dartmouth
Jun Li - University of Massachusetts Dartmouth

U28. Characterization of the Relationship Between Base Compliance and Cavitation Threshold Under Varying Dynamic Impacts

Undergraduate Expo: IMECE2023-121097
Jacob Navarro - The University of Texas at Arlington
Ashfaq Adnan - The University of Texas at Arlington


Undergraduate Expo: IMECE2023-121100
Neyton Baltodano Jr. - University of Miami
Chris Parisi - University of Miami
Emrah Celik - University of Miami

U30. Tensile Response of Lattice Structures Under Medium and Low Strain Rate Using Modified Drop Impact Tower

Undergraduate Expo: IMECE2023-121101
John Cross - The University of Texas at Arlington
Ashfaq Adnan - The University of Texas at Arlington
U31. The Effect of Process Parameters on Frontal Polymerization-Based Manufacturing of Composites
Undergraduate Expo: IMECE2023-121109
Gavin DeBrun - University of Illinois at Urbana-Champaign
Michael Zakoworotny - University of Illinois at Urbana-Champaign
Nadim Hmeidat - University of Illinois at Urbana-Champaign
Sameh Tawfick - University of Illinois at Urbana-Champaign
Nancy Sottos - University of Illinois at Urbana-Champaign
Philippe Geubelle - University of Illinois at Urbana-Champaign

U32. Deep Neural Networks Based Visual Odometry and Object Avoidance Using Stereo Vision
Undergraduate Expo: IMECE2023-121110
Neel Koney – Trinity Valley School
Aayan Adnan - Colleyville Heritage High School
Kamesh Subbarao - The University of Texas at Arlington
Rafi Chowdhury - Colleyville Heritage High School

U33. Development of Dry Electroencephalography Electrodes Using Soft Conductive Composites
Undergraduate Expo: IMECE2023-121125
Vi Pham - The University of Texas at Arlington
Richie Ranaisa Daru - The University of Texas at Arlington
Ashfaq Adnan - The University of Texas at Arlington

U34. How Engineering Self-Efficacy Develops Through Experiential Education
Undergraduate Expo: IMECE2023-121128
Evan Mock - Rochester Institute of Technology
Kathleen Lamkin-Kennard - Rochester Institute of Technology
Michael Schrlau - Rochester Institute of Technology

U35. Hypersonic Heat Transfer Correlations
Undergraduate Expo: IMECE2023-113826
Sonya Smith - Howard University
Jayson Johnson - Howard University
Chavonne Bowen - Howard University

U36. Tensile and Fatigue Behavior of Additively Manufactured Ti-6Al-4V Alloy
Undergraduate Expo: IMECE2023-121210
Ciara Morse - The University of New Orleans
Uttam Chakravarty - The University of New Orleans

U37. Preliminary Design of a Small Regenerative Bipropellant Liquid Rocket Engine Using Additive Manufacturing
Undergraduate Expo: IMECE2023-116686
Emmett Moore - University of California, Davis
Paul Erickson - University of California, Davis
U38. Building Emergency Indoor Stair Air Flow Analysis to Ensure Proper Positive Pressure: A Case Study

Undergraduate Expo: IMECE2023-116970

Jorge Portillo - Universidad Nacional de Asunción
Fabian Silguero - Universidad Nacional de Asunción
Willian Alvarez - Universidad Nacional de Asunción
Willian García - Universidad Nacional de Asunción
Jorge Lopez - Universidad Nacional de Asunción
Jorge Kurita - Universidad Nacional de Asunción

U39. Fresh Whole Blood Transfusion in Austere Environments – Effect of High Altitude

Undergraduate Expo: IMECE2023-113845

Andrea Riddle - United States Military Academy
Drew Homan - United States Military Academy
Ludvig Emerick - United States Military Academy
Emine Foust - United States Military Academy
Andrew Banko - United States Military Academy
Rakesh Dubey - United States Military Academy


Undergraduate Expo: IMECE2023-113881

Sonya Smith - Howard University
Sadlyah Anderson - Howard University

U41. CDF Analysis on Dispersion of Rural Agrochemicals in a Controlled Area: A Case Study (Work in Progress)

Undergraduate Expo: IMECE2023-113899

Jonathan Gutierrez - Universidad Nacional de Asunción
Enzo Benitez - Universidad Nacional de Asunción
Mathias Ramirez - Universidad Nacional de Asunción
Jorge Kurita - Universidad Nacional de Asunción

U42. Analysis of the Impact of Solar Radiation Through Windows on an Indoor Environment Air Thermal Performance: A Case Study

Undergraduate Expo: IMECE2023-113970

Marcos Benitez - Universidad Nacional de Asunción
Jose Osorio - Universidad Nacional de Asunción
Jose Lopez - Universidad Nacional de Asunción
Matias Vanuno - Universidad Nacional de Asunción
Arturo Machuca - Universidad Nacional de Asunción
Francisco Baez - Universidad Nacional de Asunción
Joel Irala - Universidad Nacional de Asunción
Jorge Kurita - Universidad Nacional de Asunción

U43. Analysis of Heat Transfer in a Hot Chamber of the Stirling Engine

Undergraduate Expo: IMECE2023-113997

Jonathan Amarilla - Universidad Nacional de Asunción
Jorge Kurita - Universidad Nacional de Asunción
TRACK 16: NSF Posters

Track Organizer: Po-Hao Huang – University of Arkansas

11/1/2023
12:00PM–2:00PM - Exhibit Hall G

Steam Co-Gasification of Biochar and Waste Mixed Plastic

NSF Poster Presentation: IMECE2023-110010
S.M. Khaled Khan - Georgia Southern University
Nnamdi Ofuani - Georgia Southern University
Prakash Bhoi - Georgia Southern University

N100. Numerical Model of Steam Co-Gasification of Waste Plastics and Biochar in a Fixed Bed Reactor to Predict Syngas Composition

NSF Poster Presentation: IMECE2023-112729
Nufile Ahmed - Georgia Southern University
Cameron Perry - Georgia Southern University
Marcel Ilie - Georgia Southern University
Prakash Bhoi - Georgia Southern University


NSF Poster Presentation: IMECE2023-118763
Brandon Hayes - University of Colorado Boulder
Robert Maccurdy - University of Colorado Boulder

N102. Coupling Loss Factor for Plate–Plate Structures

NSF Poster Presentation: IMECE2023-119405
Zahra Sotoudeh - California State Polytechnic University, Pomona
Stephie Soloarivony - California State Polytechnic Institute, Pomona
Angel Juarez - California State Polytechnic Institute, Pomona
John Vincent Cunanan - California State Polytechnic Institute, Pomona

N103. Studying Grain Boundary Regions in Polycrystalline Tantalum Using Spherical Nano-Indentation

Poster Presentation: IMECE2023-119576
Olajesu Olanrewaju - Iowa State University
Manish Kumar - Iowa State University
Kevin Jacob - Iowa State University
Curt Bronkhorst - University of Wisconsin-Madison
Nan Chen - University of Wisconsin
Marko Knezevic - University of New Hampshire
William Musinsky - Air Force Research Laboratory
Manny Gonzales - Air Force Research Laboratory
Sid Pathak - Iowa State University

N104. Roll-to-Roll Fabrication of Antimicrobial Textiles by Polydopamine-Assisted Electroless Plating

NSF Poster Presentation: IMECE2023-119667
Ho Kun Woo - University of Illinois at Urbana-Champaign
Aman Metha - University of Illinois at Urbana-Champaign
Alex Karrow - University of Illinois at Urbana-Champaign
Ronan Looney - University of Illinois at Urbana-Champaign
Lili Cai - University of Illinois at Urbana-Champaign
N105. Reliability Characteristics of Metals/Low-K Interconnect After Post-Annealing

**NSF Poster Presentation: IMECE2023-119680**

Rajib Chowdhury - University of Louisiana at Lafayette
Tom Poché - University of Louisiana at Lafayette
Seonhee Jang - University of Louisiana at Lafayette

N106. Design and Optimization of a Wheel Hub Incorporating Conic Curves to Mitigate Concentrated Stress Generated During Bump, Cornering, and Braking

**NSF Poster Presentation: IMECE2023-119682**

Yash Ashok Kumar Patel - National Institute of Technology Tiruchirappalli
Sedhumaadhavan Senthil Kumar Arummozhi - National Institute of Technology Tiruchirappalli
Manikanta Gudla - National Institute of Technology Tiruchirappalli


**NSF Poster Presentation: IMECE2023-119688**

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

N108. Study of Hydrogen Attacks on Boiler Components by Phase Field Modeling

**NSF Poster Presentation: IMECE2023-119729**

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


**NSF Poster Presentation: IMECE2023-119817**

Obed Tetteh - Southern University and A&M College
Munetaka Kubota - University of Delaware
Patrick Mensah - Southern University and A&M College
John Gillespie - University of Delaware
Guoqiang Li - Louisiana State University

N110. Frontal-Polymerization-Based Growth Printing: Modeling and Optimization

**NSF Poster Presentation: IMECE2023-119895**

Matthew Minjiang Zhu - University of Illinois at Urbana Champaign
Yun Seong Kim - University of Illinois at Urbana Champaign
Tanver Hossain - University of Illinois at Urbana Champaign
Randy Ewoldt - University of Illinois at Urbana Champaign
Sameh Tawfick - University of Illinois at Urbana Champaign
Yuan Gao - Huazhong University of Science and Technology
Philippe Geubelle - University of Illinois at Urbana Champaign

N111. Scalable Green Manufacturing of Microstructured Surfaces Using Viscoelastic Interfacial Instability

**NSF Poster Presentation: IMECE2023-113418**

Jon Ryu - North Carolina State University
Sipan Liu - North Carolina State University
Md Didarul Islam - North Carolina State University
Benjamin Black - North Carolina State University
Myers Harbinson - North Carolina State University
Michael Pudlo - North Carolina State University
N112. Soft–Hard Material Integration Enabled Mechanical Janus Structures

NSF Poster Presentation: IMECE2023-119901

Haozhe Zhang - University of Virginia

N113. Revolutionizing Biomedical Devices: From 2d to 3d Microfluidics for Enhanced Disease Monitoring and Drug Delivery

NSF Poster Presentation: IMECE2023-119905

Mengtian Yin - University of Virginia
Baoxing Xu - University of Virginia

N114. Role of Mechanics on Electrodeposition Stability in Solid-State Batteries

NSF Poster Presentation: IMECE2023-119908

Debanjali Chatterjee - Purdue University
Kaustubh Girish Naik - Purdue University
Bairav Sabarish Vishnugopi - Purdue University
Partha P. Mukherjee - Purdue University

N115. Analysis of Novel Slotted Microstrip Antenna With Defected Ground for Advanced Applications in Communication

NSF Poster Presentation: IMECE2023-119929

Daniel Yeboah - Southern University and A&M College
Fareed Dawan - Southern University and A&M College
Patrick Mensah - Southern University and A&M College

N116. High-Efficiency Refrigerator With Cold Thermal Energy Storage

NSF Poster Presentation: IMECE2023-119937

Samuel Amoafo-Yeboah - Southern University and A&M College
Stephen Akwaboa - Southern University and A&M College
Patrick Mensah - Southern University and A&M College

N117. Mitigation of Reaction-Front-Merger Induced Thermal Spike Using a Metal Strip

NSF Poster Presentation: IMECE2023-119979

Sagar Vyas - University of Illinois at Urbana-Champaign
Polette Centellas - University of Illinois at Urbana-Champaign
Nancy Sottos - University of Illinois at Urbana-Champaign
Philippe Geubelle - University of Illinois at Urbana-Champaign

N118. High Performance Shape Memory Regolith Composite Material for Extra-Terrestrial Application

NSF Poster Presentation: IMECE2023-119989

Kingsley Yeboah Gyabaah - Southern University and A&M College
Patrick Mensah - Southern University and A&M College
Maryam Jahan - Southern University and A&M College

N119. Harnessing Machine Learning for Efficient Prediction of Glassy Modulus in Thermoset Shape Memory Polymers

NSF Poster Presentation: IMECE2023-120011

Ama Darkwah - Southern University and A&M College
Cheng Yan - Southern University and A&M College
Patrick Mensah - Southern University and A&M College
N120. Predicting Thermal Conductivity of Additively Manufactured Alloys Using Machine Learning Based Models

**NSF Poster Presentation: IMECE2023-120013**

Evelyn Quansah - Southern University and A&M College  
Patrick Mensah - Southern University and A&M College

N121. Roll to Roll Dry Transfer Multilayer Graphene

**NSF Poster Presentation: IMECE2023-120039**

Enrique Velasquez Morquecho - The University of Texas at Austin  
Nan Hong - The University of Texas at Austin  
Qishen Zhao - The University of Texas at Austin  
Wei Li - The University of Texas at Austin

N122. In-Chip Cooling Technology Within Semiconductor Switches

**NSF Poster Presentation: IMECE2023-113749**

Samual Sisk - University of Missouri-Kansas City  
Sarvenaz Sobhansarbandi - University of Missouri-Kansas City

N123. Role of Rayleigh-Bénard Convection in Cloud Formation for the Planetary Cloud Aerosol Research Facility

**NSF Poster Presentation: IMECE2023-120040**

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

N124. Reconfiguration of Digital Light Projection 3D Printer to Print on the Micrometer Scale

**NSF Poster Presentation: IMECE2023-120054**

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

N125. Low Velocity Impact Characterization of Composite Laminates Reinforced With Agricultural Waste Fillers

**NSF Poster Presentation: IMECE2023-120073**

Emmanuel Aidoo - Southern University and A&M College  
Maryam Jahan - Southern University and A&M College  
Patrick Mensah - Southern University and A&M College

N126. Tuning Energy Transport in Helical Protein Nanotubes Through Side-Chain Modifications

**NSF Poster Presentation: IMECE2023-120083**

Jiayue Hu - Temple University  
Ling Liu - Temple University


**NSF Poster Presentation: IMECE2023-120087**

Lu Lu - Stanford University  
Jize Dai - Stanford University  
Sophie Leanza - Stanford University  
John W. Hutchinson - Harvard University  
Ruike Renee Zhao - Stanford University
N128. Modeling of Contact in Biphasic Soft Material

NSF Poster Presentation: IMECE2023-120143
Agnila Ghosh Surovi - The University of Tennessee Knoxville
Shank Kulkarni - The University of Tennessee Knoxville
Timothy Truster - The University of Tennessee Knoxville


NSF Poster Presentation: IMECE2023-120147
Austin Hayes - University of Colorado Boulder

N130. The Morphological Effect of Solvent Blends on Polymer Films Created via Self-Limiting Electrospay Deposition

NSF Poster Presentation: IMECE2023-120161
Isha Shah - Rutgers University
Robert Green-Warren - Rutgers University
Noah McAllister - Rutgers University
Andrew Huth - Rutgers University
Assimina Pelegri - Rutgers University
Jonathan Singer - Rutgers University

N131. Elephant Trunk Inspired Soft Robotic Arm via Liquid Crystal Elastomers

NSF Poster Presentation: IMECE2023-120202
Sophie Leanza - Stanford University
Juliana Lu-Yang - Stanford University
Shuai Wu - Stanford University
Ellen Kuhl - Stanford University
Renee Zhao - Stanford University

N132. Design and Fabrication of a Supercritical CO2 Fluid Extraction Chamber

NSF Poster Presentation: IMECE2023-120348
Jonesha Turner - Southern University and A&M College
Fareed Dawan - Southern University and A&M College
Patrick Mensah - Southern University and A&M College

N133. Performance Enhancement of PV/T Systems Integrated With Nanofluids

NSF Poster Presentation: IMECE2023-113807
Laura Munoz-Baroja - University of Missouri-Kansas City
Sarvenaz Sobhansarbandi - University of Missouri-Kansas City

N134. Experimental Investigation of the Nano-Fin Effect (NFE) During Thin Film Evaporation From Nanopores Using Temperature Nano-Sensors

NSF Poster Presentation: IMECE2023-120351
Juliet Shafer - Texas A&M University
Jonghyun Lee - Texas A&M University
Ashok Thyagarajan - Texas A&M University
Debijyoti Banerjee - Texas A&M University

N135. Harnessing Persistent Electrospinning Instabilities: One-Step Nanofabrication of Large Highly Aligned 3D Nanofiber Arrays

NSF Poster Presentation: IMECE2023-120392
Emmanuel Mensah - University of Nebraska-Lincoln
Benjamin Bashtovoi - University of Nebraska-Lincoln
Mikhail Karashov - University of Nebraska-Lincoln
Yuris Dzenis - University of Nebraska-Lincoln
<table>
<thead>
<tr>
<th>Poster Number</th>
<th>Title</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>N136</td>
<td>Effect of Heat Treatment on the Ultrasonic and Mechanical Response of Niti Shape Memory Alloys</td>
<td>Olivia J. Cook - Penn State University, Foster Feni - Penn State University, Mique Gonzales - Penn State University, Reginald Hamilton - Penn State University, Andrea P. Argüelles - Penn State University</td>
</tr>
<tr>
<td>N137</td>
<td>Acoustic Characterization of Damage in Multilayer Ceramic Capacitors</td>
<td>Haley N. Jones - Penn State University, Susan Trolier-Mckinstry - Penn State University, Andrea P. Argüelles - Penn State University</td>
</tr>
<tr>
<td>N138</td>
<td>Exploring Na+ and K+ Ion Storage Behavior of WS2 Nanosheet-Loaded SiOC Fiber Structures</td>
<td>Sonjoy Dey - Kansas State University, Gurpreet Singh - Kansas State University</td>
</tr>
<tr>
<td>N139</td>
<td>Development and Characterization of Designed Electrospun Nanofibers for Cardiovascular Application</td>
<td>Alexi Switz - Florida International University, Salman Jamal - Florida International University, Anamika Prasad - Florida International University</td>
</tr>
<tr>
<td>N140</td>
<td>Thermal Performance Evaluation of Parabolic Trough Collectors Integrated With a High Thermal Conductive Nanofluid</td>
<td>Michael Englert - University of Missouri-Kansas City, Sarvenaz Sobhansarbandi - University of Missouri-Kansas City</td>
</tr>
<tr>
<td>N141</td>
<td>Effect of Surface Curvature and Surface Tension on the Mechanics of Adhesion of Soft Materials</td>
<td>A. Derya Bakiler - The University of Texas at Austin, Berkin Dortdivanlioglu - The University of Texas at Austin</td>
</tr>
<tr>
<td>N142</td>
<td>Magnetic Tunnel Junction Molecular Spintronics Based Chemical Sensing Device</td>
<td>Pius Suh - University of The District of Columbia</td>
</tr>
</tbody>
</table>
TRACK 17: Research Posters

Track Organizer: Omid Askari – West Virginia University
Track Co-Organizer: Reuben Kraft – Pennsylvania State University

11/1/2023
12:00PM–2:00PM - Exhibit Hall G

R200. Double Solar Screens Installed on Window With Different Opening Sizes
Poster Presentation: IMECE2023-109096
Esam Alawadhi - Kuwait University

R201. Designing a Mechanism of Lifting Suspension in Wheeled Armoured Vehicles
Poster Presentation: IMECE2023-109361
Ahmet Cagkan Cevik - ASELSAN Inc.

R202. Designing a Protocol to Determine the Impacts of Fatigue on Suture Knots
Poster Presentation: IMECE2023-111960
Brandon Clumpner - United States Military Academy
Madeleine Suh - United States Military Academy
Benjamin Simonson - United States Military Academy
Michael Donohue - Keller Army Community Hospital

R203. An Educational Approach That Is in Conformity With the Enrolled-Audience and Their Acquainted Thoughts
Poster Presentation: IMECE2023-120255
Satya Prasad Paruchuru - VNRVJIET
Jashwitha Chowdary Nuthalapati - VNRVJIET

R204. Minerals From Seawater: A Case of Blue Economy for the Gulf of Mexico
Poster Presentation: IMECE2023-120257
Lea Der Chen - Texas A&M University–Corpus Christi
Jeffrey Zhu - The University of Texas at Austin

R205. Multifaceted and Dynamic Forecast of the Consumer Specific Requirements: Foresight for the Market Intelligence
Poster Presentation: IMECE2023-120262
Satya Prasad Paruchuru - VNRVJIET
Pratusha Bandla - VNRVJIET

R206. Structural Radiative Cooling in Highly Reflective White Snail Shells as Adaptation to Extreme Heat Environments
Poster Presentation: IMECE2023-120263
Andrea Felicelli - Purdue University
Emily Barber - Purdue University
Sultan Alnajdi - Purdue Mall
Xiulin Ruan - Purdue University
George Chiu - Purdue University
Dror Hawlena - Hebrew University of Jerusalem
Pablo Zavattieri - Purdue University
R207. The Preliminary Functions of a Living Structure and Subsystem: Capabilities of the Multi-Functional Mechanics

Poster Presentation: IMECE2023-120269
Satya Prasad Paruchuru - VNRVJIET
Gagan Paruchuru - Sri Chaitanya Junior College, KPHB

R208. Multiphase Modeling of Droplet-Based 3D Printing: Predicting Printability, Resolution, and Shape Fidelity in Additive Manufacturing Processes

Poster Presentation: IMECE2023-120272
Rauf Shah - North Carolina A&T State University
Ram Mohan - North Carolina A&T State University

R209. Effect of Particle Size Distribution on Voids in Metal Additive Manufacturing

Poster Presentation: IMECE2023-120279
Nikhil Ingle - North Carolina A&T State University
Ram Mohan - North Carolina A&T State University

R210. Rural Intervention for the Effective Revival of Socio-Economic Sufficiency: Awareness Specific Adaptability of Technology

Poster Presentation: IMECE2023-120281
Satya Prasad Paruchuru - VNRVJIET
Meghana Nidadavolu - VNRVJIET

R211. Resource Specific Technology for Food Processing and Hospitality Industry: Geographic and Life Specific Technology

Poster Presentation: IMECE2023-120287
Satya Prasad Paruchuru - VNRVJIET
Manjula Sri Rayudu - VNRVJIET

R212. From Lea...
R216. Need Based Multi-Functional Yield for the Effectively Customized Situation: An Exploratory and Feasibility Requisite

**Poster Presentation: IMECE2023-120296**

Satya Prasad Paruchuru - VNRVJIET  
Anuradha Kotapati - VNRVJIET  
Gagan Paruchuru - Sri Chaitanya Junior College, KPHB

R217. Foresights Into the Aging Research That Imparts the Essentials: A Way to Healthy Transformation

**Technical Presentation: IMECE2023-120301**

Satya Prasad Paruchuru - VNRVJIET  
Ramu Rathlavath - VNRVJIET

R218. Decisive Utilization of the Hr to Augment the Capabilities: Proposition for the Socio-Cultural Improvement

**Poster Presentation: IMECE2023-120306**

Satya Prasad Paruchuru - VNRVJIET  
Nareah Hazari - VNRVJIET


**Poster Presentation: IMECE2023-120309**

Satya Prasad Paruchuru - VNRVJIET  
Venu Yarlagadda - VNRVJIET

R220. Investigating the Influence of Nanoparticle Size and Loading on Printability of Polymer-Nanoparticle Composite Inks for Direct Ink Writing

**Poster Presentation: IMECE2023-120315**

Yun Li - Villanova University  
Aidan Flynn - Villanova University  
Christopher Masternick - Villanova University  
Brandon Kolanovic - Villanova University  
Bin Li - Wichita State University  
Liang Zhao - Villanova University  
Mingyuan Sun - Villanova University  
Bo Li - Villanova University

R221. Monolayer 2D Material-Polymer Nanohybrid Crystals

**Poster Presentation: IMECE2023-120325**

Mingyuan Sun - Villanova University  
Dong Zhou - Villanova University  
Akash Singh - University of Illinois at Urbana-Champaign  
Lu An - Villanova University  
Jan Michael Carrillo - Oak Ridge National Laboratory  
Jong Keum - Oak Ridge National Laboratory  
Miguel Fuentes-Cabrera - Oak Ridge National Laboratory  
Raymond Unocic - Oak Ridge National Laboratory  
Kunlun Hong - Oak Ridge National Laboratory  
Ilia Ivanov - Oak Ridge National Laboratory  
Christopher Rouleau - Oak Ridge National Laboratory  
Gang Feng - Villanova University  
Kai Xiao - Oak Ridge National Laboratory  
Jihua Chen - Oak Ridge National Laboratory  
Yumeng Li - University of Illinois at Urbana-Champaign  
Liang Zhao - Villanova University  
Yun Li - Villanova University  
Bo Li - Villanova University
R222. Anti-Corrosion Application of Graphene on Copper Electrodes in an Electrolyzer

Poster Presentation: IMECE2023-120338

Enrique Velasquez Morquecho - The University of Texas at Austin
Paul Kim - The University of Texas at Austin
Wei Li - The University of Texas

R223. Accelerated Molecular Dynamics Simulation for Large Conformational Changes in Proteins

Poster Presentation: IMECE2023-112240

Soon Woo Park - Sungkyunkwan University
Woo Kyun Kim - University of Cincinnati
Moon Ki Kim - Sungkyunkwan University

R224. Salt-Assisted Assembly of MXene on Arbitrary Polymers

Poster Presentation: IMECE2023-120340

Liang Zhao - Villanova University
Lingyi Bi - Drexel University
Jiayue Hu - Temple University
Guanhui Gao - Shared Equipment Authority, Rice University
Danzhen Zhang - Drexel University
Yun Li - Villanova University
Aidan Flynn - Villanova University
Teng Zhang - Drexel University
Ruocun Wang - Drexel University
Mingyuan Sun - Villanova University
Ling Liu - Temple University
Yury Gogotsi - Drexel University
Bo Li - Villanova University

R225. Experimental Investigation of the Nano-Fin Effect (NFE) During Thin Film Evaporation From Nanopores Using Temperature Nano-Sensors

Poster Presentation: IMECE2023-120356

Juliet Shafer - Texas A&M University
Jonghyun Lee - Texas A&M University
Ashok Thyagarajan - Texas A&M University
Debjyoti Banerjee - Texas A&M University

R226. Active Learning in an Online Environment

Poster Presentation: IMECE2023-119303

Mysore Narayanan - Miami University

R227. Wed-Machining With Molybdenum Wire of Inconel 718 Alloy Using Different Dielectric Fluids

Poster Presentation: IMECE2023-112247

Fred Amorim - Pontificia Universidade Catolica do Paraná
Giovani Conrado Carlini - Pontificia Universidade Católica do Paraná

R228. Finite Element Analysis of 3D Printed Stand-Alone Transforaminal Lumbar Interbody Fusion Cages Under Various Loadings

Poster Paper Publication: IMECE2023-112314

Yufei Zhang - California State University, Fullerton
Minjae Kang - California State University, Fullerton
Siheng Su - California State University, Fullerton

R229. Non Ice-Vehicles and Their Life Cycle: Value Analysis for Resource Investment and Integration of Circular Functionality for Battery 2nd Life Applications in Mobile Charging Infrastructure Setup for Remote Locations

Poster Presentation: IMECE2023-112364

Vaibhav Sanghvi - Technical University of Berlin
R230. On the Electromechanical Instability of Polar Elastomers

Poster Presentation: IMECE2023-112584

Masoud Olia - Wentworth Institute of Technology
Hamid Nayeb-Hashemi - Northeastern University
Yanhui Jiang - Nanjing University of Science and Technology
Yan Su - Nanjing University of Science and Technology

R231. Higher Order Sensitivity Analysis for Elastic Problems Using the Multidual Finite Element Method

Poster Paper Publication: IMECE2023-112622

David Avila - The University of Texas at San Antonio
Arturo Montoya - The University of Texas at San Antonio
Harry Millwater - The University of Texas at San Antonio

R232. Interactive Visualization Tools for the Study of Spherical and Spatial Kinematics

Poster Presentation: IMECE2023-112685

Pierre Larochelle - South Dakota School of Mines & Technology

R233. Sustainability Design Analysis; Topology Optimization of Automated Rotary Dryer Component

Poster Presentation: IMECE2023-112747

Rufus Chime - Institute of Management and Technology

R234. Investigation of the Mechanical Properties of Triply Periodic Minimal Surface Bone Scaffolds, Composed of Poly(lactic-Co-Glycolic Acid), Nanoclay, and Hydroxyapatite

Poster Presentation: IMECE2023-110406

Ethan O’Malley - Marshall University
Roozbeh (Ross) Salary - Marshall University

R235. Experiential Learning of Met Tower Instrumentation for Wind Energy Assessment

Poster Presentation: IMECE2023-112828

Ram Poudel - Appalachian State University
Brian Raichle - Appalachian State University

R236. Synthesis and Characterization of Polylactic Acid Microspheres via Emulsion Based Processing

Poster Presentation: IMECE2023-112967

Ransford Damptey - Joint School of Nanoscience and Nanoengineering
Sabrina Torres - Kansas City National Security Campus
Laura Cummings - Kansas City National Security Campus
Ram Mohan - Joint School of Nanoscience and Nanoengineering

R237. Analysis of Poultry Feed Mixing Machine Design; Management Approach

Poster Presentation: IMECE2023-112972

Rufus Chime - Institute of Management and Technology
Benedict Ugwu - Enugu State University of Science and Technology
Abdulraheem Ahmed Alagbed - Akanu Ibiam Federal Polytechnic, Unwana
R238. Development of a Rapid Manufacturable Microdroplet Generator With Pneumatic Control and Parallel Congruent Electrode Sensor to Detect and Characterize Droplets

Poster Presentation: IMECE2023-113035

Gnanesh Nagesh - University of Windsor
Mohammed Jalal Ahmed - University of Windsor
David Ting - University of Windsor

R239. The Morphological, Mechanical, and Thermal Properties of Polypropylene Reinforced With Graphene Nanoparticles Extracted From Paper Cups

Poster Presentation: IMECE2023-113039

Khiri Scott - Tuskegee University

R240. Squealer Tip Application and Aerodynamic Performance Prediction for Industrial Gas Turbine Axial Compressor

Poster Presentation: IMECE2023-113225

Hyeon-Jun Yang - Sungkyunkwan University
Hyun-Su Kang - Sungkyunkwan University
Youn-Jea Kim - Sungkyunkwan University

R241. In-Situ Observation on Crystallization Behaviors of Blast Furnace Slag in Variable Cooling Conditions

Poster Presentation: IMECE2023-113258

Bin Ding - China University of Petroleum (East China)

R242. Thermal Behavior of PCMs During Phase Transitions With Phase Change Hysteresis: Experimental Setup Development and Problems of Model Validation

Poster Paper Publication: IMECE2023-113269

Martin Zálešák - Brno University of Technology
Pavel Charvát - Brno University of Technology
Lubomír Klimeš - Brno University of Technology
Ondřej Pech - Brno University of Technology
Patrik Bouchal - Brno University of Technology


Poster Presentation: IMECE2023-113281

Vaibhav Sanghvi - Technical University Berlin

R244. A Solution to an Inverse Heat Transfer Problem With Phase Change by Means of Meta-Heuristics and Artificial Neural Networks: A Comparative Study

Poster Paper Publication: IMECE2023-113333

Lubomir Klimes - Brno University of Technology
Jakub Kudela - Brno University of Technology
Martin Zalesak - Brno University of Technology
Pavel Charvat - Brno University of Technology
R245. A Comparative Study on Insulation Materials in Tanks for the Storage of Cryogenic Fluids in Fire Incidents

**Poster Paper Publication: IMECE2023-110470**

Robert Eberwein - Bundesanstalt für Materialforschung und -prüfung
Aliasghar Hajhariri - Bundesanstalt für Materialforschung und -prüfung
Davide Camplese - Alma Mater Studiorum - Università di Bologna
Giordano Emrys Scarponi - Alma Mater Studiorum - Università di Bologna
Valerio Cozzani - Alma Mater Studiorum - Università di Bologna
Frank Otremba - Bundesanstalt für Materialforschung und -prüfung

R246. CFD Analysis of the Impacting Factors of Patients Varying Blood Conditions on the Artificial Heart’s Device Performance

**Poster Presentation: IMECE2023-113349**

Zheng Cao - Xi’an Jiaotong University
Qi Xia – Xi’an Jiaotong University
Jianqiang Deng - Xi’an Jiaotong University
Lin Lu - The Hong Kong Polytechnic University

R247. Multiscale Operational Methodology: An Overview

**Poster Presentation: IMECE2023-113420**

Satya Prasad Paruchuru - VNRVJET

R248. A Novel Multi-Scale Model for the Effect of Hydrogen on the Mechanical Behavior of Crystalline Materials

**Poster Presentation: IMECE2023-113462**

Tarek Hatem - University of Nevada, Las Vegas

R249. Atomistic Simulation of GaN/Diamond Interface Through Direct Bonding With Amorphous Interlayer and Novel Nanostructures

**Poster Presentation: IMECE2023-113737**

Yang Li - Massachusetts Institute of Technology
Luke Yates - Sandia National Laboratories
Asegun Henry - Massachusetts Institute of Technology

R250. Mechanical Property Characterizations of Woven Natural Fiber-Reinforced Biopolymers 3d Printed Through a Laminated Object Manufacturing Process

**Poster Presentation: IMECE2023-113800**

Lai Jiang - Prairie View A&M University

R251. Applying Heat Shrinking to Minimize Pillow Effect During Incremental Sheet Forming

**Poster Paper Publication: IMECE2023-113988**

Kevin Schmaltz - Western Kentucky University

R252. In-Depth Spectroscopic Study of Hafnium Carbide for Extreme Environments

**Poster Presentation: IMECE2023-114105**

Shakir Bin Mujib - Kansas State University
Mohammed Rasheed - Kansas State University
Saravanan Arunachalam - Spirit AeroSystems Inc.
Gurpreet Singh - Kansas State University
R253. Heterogeneous Self-Healing Mechanisms of Metals at Nano-Scale
Poster Presentation: IMECE2023-114108
Mohamed Ibrahim - Cairo University
Ahmed Shaker - The British University in Egypt
Abdulrahman Rabea Muhammad - Cairo University
Iman El-Mahallawi - Cairo University
Tarek Hatem - University of Nevada, Las Vegas

R254. Assessing the High-Temperature Suitability of SiC Fiber-Reinforced Quaternary Ceramic Matrix Composites
Poster Presentation: IMECE2023-114122
Shakir Bin Mujib - Kansas State University
Mohammed Rasheed - Kansas State University
Gurpreet Singh - Kansas State University

R255. Active Composites for Realizing Structural Self-Awareness
Poster Presentation: IMECE2023-114213
Shulong Zhou - University of Michigan–Shanghai Jiao Tong University Joint Institute
Yanfeng Shen - University of Michigan–Shanghai Jiao Tong University Joint Institute

R256. Online-NDE Technique for Industrial Fluid Measurements
Poster Presentation: IMECE2023-110474
Runye Lu - University of Michigan–Shanghai Jiao Tong University Joint Institute
Yanfeng Shen - University of Michigan–Shanghai Jiao Tong University Joint Institute

R257. Observation of Localized Modes in the Continuum-Based Waveguides in Architected Elastic Plates
Poster Presentation: IMECE2023-114284
Adib Rahman - Kansas State University
Sean Perkins - Kansas State University
Raj Kumar Pal - Kansas State University

R258. Photovoltaic Effect on Metal/Insulator/Semiconductor (MIS) Based Magnetic Tunnel Junction-Based Molecular Spintronics Devices
Poster Presentation: IMECE2023-114406
Pius Suh - University of the District of Columbia

R259. Analysis of Radiopaque Coatings of PCL Flow Diverters for Brain Aneurysms
Poster Presentation: IMECE2023-115038
Mohammad Hossan - University of Central Oklahoma
Noor Akour - University of Central Oklahoma
Alex Matsayko - University of Central Oklahoma
Melville Vaughan - University of Central Oklahoma

Poster Paper Publication: IMECE2023-116409
Paulina Capela - DEM, University of Minho
Flávia Barbosa - METRICs – The Mechanical Engineering and Resource Sustainability Center
Inês V. Gomes - University of Minho
Filipe Prior - Prifer - Fundição, S.A.
Hélder Puga - University of Minho
Delfim Soares - University of Minho
José Carlos Teixeira - METRICs – The Mechanical Engineering and Resource Sustainability Center
R261. Design and Optimization of Spring in Vibratory MEMS

**Poster Presentation: IMECE2023-117928**

Shahpour Alirezaee - University of Windsor
Ahmad Rahbar Ranji - University of Windsor
Mohammad Jalal Ahamed - University of Windsor

R262. Computational and Experimental Characterization of Functionally Gradient Tissue Scaffolds for Complex Loading Conditions

**Poster Presentation: IMECE2023-118567**

Ali Entezari - University of Technology Sydney
Chi Wu - University of Sydney
Qing Li - University of Sydney

R263. A Non-Invasive, Label-Free Acoustic Microfluidics Separation Device: An Experimental Study

**Poster Presentation: IMECE2023-118984**

Ozge Uyanik - University of South Florida
Rasim Guldiken - University of South Florida


**Poster Presentation: IMECE2023-119021**

Hafiz Muhammad Ali - King Fahd University of Petroleum and Minerals
Muhammad Asif - King Fahd University of Petroleum and Minerals

R265. Renewable Energy Driven Pure Oxygen-Based Membrane Aerated Biofilm Reactor for Wastewater Treatment

**Poster Presentation: IMECE2023-119166**

Abdallah Abdelfattah Mohammed Abdelfattah Abdelmoula - Tanta University

R266. Influence of Long-Term Operation on Creep Deformation and Rupture Strength of Mod.9Cr-1Mo Steel Welded Joint

**Poster Presentation: IMECE2023-119212**

Hayato Ikekami - Chiba Institute of Technology
Takashi Ogata - Chiba Institute of Technology

R267. Effectiveness of Short Lecture Videos During the Covid Pandemic and Beyond

**Poster Presentation: IMECE2023-110622**

Masoud Olie - Wentworth Institute of Technology

R268. Creep Void Nucleation and Growth Simulation Under Multiaxial Stress for Modified 9Cr-1Mo Forging Steel

**Poster Presentation: IMECE2023-119214**

Tepppei Noguchi - Chiba Institute of Technology
Takashi Ogata - Chiba Institute of Technology

R269. Carbon Fiber-Reinforced Plastics Machining Using the Industrial Robots

**Poster Presentation: IMECE2023-119268**

Hyung Wook Park - Ulsan National Institute of Science and Technology
R270. Apex-Shifted Radon Transform-Based Direct Arrival Removal for Ultrasonic Array Measurements

Poster Presentation: IMECE2023-119400
Augustine Loshelder - The University of Alabama
Jiaze He - The University of Alabama
John Day - The University of Alabama


Poster Presentation: IMECE2023-119402
Junsik Lee - Changshin University
Jun Ho Lee - J-Mecha Tech

R272. Defect Imaging With Adjoint Tomography Theory Based Reverse-Time Migration Through Impedance Gradient

Poster Presentation: IMECE2023-119648
John Day - The University of Alabama
Jiaze He - The University of Alabama
Jeffrey Shragge - Colorado School of Mines
Paul Sava - Colorado School of Mines
Erin Lanigan - NASA Marshall Space Flight Center
Delphine Duquette - NASA Marshall Space Flight Center
Gavin Dao - Advanced OEM Solutions

R273. Thermofluid Sciences for Elementary School Students via Flow Visualization Using Smartphones and Tablets

Poster Presentation: IMECE2023-119681
Shemai’ya Peak - The University of Alabama
Jale Ercan Dursun - The University of Alabama
Frances Buntain - The University of Alabama

R274. Effect of Multiaxial Stress State on Creep Rupture Strength of CC and DS Ni-Based Superalloy Rene80

Poster Presentation: IMECE2023-119690
Toshiki Kamada - Chiba Institute of Technology
Takashi Ogata - Chiba Institute of Technology


Poster Presentation: IMECE2023-119701
Darryl “Keith” Floyd - University of West Florida
Tiffany Jackman - University of West Florida

R276. A Comparative Study of Feature-Based and Image-Based Clustering Techniques for Laser Powder Bed Fusion Process Monitoring

Poster Presentation: IMECE2023-119720
Yande Ndiaye - National Institute of Standards and Technology
Jaehyuk Kim - National Institute of Standards and Technology
Zhuo Yang - National Institute of Standards and Technology
Yan Lu - National Institute of Standards and Technology
Mario Lezoche - Université de Lorraine
R277. A Deep Learning Based Approach to Improve Reconstruction of Time-Domain Full Waveform Inversion

**Poster Presentation:** IMECE2023-119747

Shoaib Anwar - The University of Alabama
Austin Yunker - Argonne National Laboratory
Rajkumar Kettimuthu - Argonne National Laboratory
Mark Anastasio - University of Illinois at Urbana-Champaign
Umberto Villa - The University of Texas at Austin
Jiaze He - The University of Alabama

R280. A Novel Experimental Setup for Characterizing the Bearing Failure Strain of Advanced Composite Materials Using 3D-Digital Image Correlation

**Poster Presentation:** IMECE2023-119818

Abdulaziz Alzurahi - The University of Sheffield
Zilei Chen - The University of Sheffield
Fatma Omrani - AMRC with Boeing, The University of Sheffield
Christophe Pinna - The University of Sheffield

R278. On the Relationship Between the Vibration Characteristics of an Automobile Wheel and Generated Road Noise in the Vehicle Cabin and Resonance Noise

**Poster Presentation:** IMECE2023-111270

Sho Kobayashi - Toyama Prefectural University
Ryo Kiyotaki - Toyama Prefectural University
Li Zhe - Toyama Prefectural University
Osamu Terashima - Toyama Prefectural University

R281. Vibration Analysis for Fault Detection in Fused Filament Fabrication Printing

**Poster Presentation:** IMECE2023-119823

Alexander Isiani - Louisiana Tech University
Kelly Crittenden - Louisiana Tech University
Leland Weiss - Louisiana Tech University

R279. Experimental Ultrasound Computed Tomography for Material Characterization Using a Linear Array Pair

**Poster Presentation:** IMECE2023-119762

Md Aktharuzzaman - The University of Alabama
Shoaib Anwar - The University of Alabama
Dmitry Borisov - The University of Kansas
Jiaze He - The University of Alabama


**Poster Presentation:** IMECE2023-119833

Mohammed Jalaal Ahamed - University of Windsor

R283. A Novel Simulation Framework to Model Shot Peening Using a Multiscale Approach

**Poster Presentation:** IMECE2023-119855

Satish Kumar Meenakshisundaram - ANSYS, Inc.
Sunil Acharya - ANSYS, Inc.
Ahmad Haghneaghdar - ANSYS, Inc.
R284. Experimental and Numerical Study of Energy Absorbing Layer on the Jet Formation in Laser-Induced-Forward-Transfer (LIFT) Printing

Poster Presentation: IMECE2023-119867
Shuqi Zhou - University of Houston
Ben Xu - University of Houston

R285. Experimental Assessment of Heat Transfer During Condensation of R32 Over Single Horizontal Plain, 2D and 3D Integral Finned Tubes

Poster Presentation: IMECE2023-119876
Ibrahim Mustefa Mohammed - Indian Institute of Technology Roorkee
Ravi Kumar - Indian Institute of Technology Roorkee

R286. Thickness and Strain Dependent Cross-Plane Thermal Conductivity in ReS2 With Stacking Order

Poster Presentation: IMECE2023-119922
Zefang Ye - The University of Texas at Austin
Yaguo Wang - The University of Texas at Austin

R287. Thermography With an Ultrasonic Transducer and Buffer Rod

Poster Presentation: IMECE2023-119965
Mustafa Demirci - University of South Florida
Rasim Guldiken - University of South Florida

R288. Experimental Investigation of Process Induced Effects on Surface Roughness Characteristics of 3D Printed Parts in a Polyjet Am Setup

Poster Presentation: IMECE2023-119975
Ram Mohan - North Carolina Agricultural & Technical State University
Vishwanath Khapper - North Carolina Agricultural & Technical State University
Nitin More - North Carolina Agricultural & Technical State University

R289. Water Vapor Based Artificial Muscles

Poster Presentation: IMECE2023-111622
Tan Hoang - The University of Texas at Dallas
Hootan Rahimi - The University of Texas at Dallas
Juan Godinez - The University of Texas at Dallas
Yonas Tadesse - The University of Texas at Dallas
Seung M. You - The University of Texas at Dallas
Dani Fadda - The University of Texas at Dallas

R290. Batch Aerobic Digestion Bioprocessing Using Numerical Analysis and Simulation

Poster Presentation: IMECE2023-119986
Zachary Dulany - Tarleton State University
Hoe Gil Lee - Tarleton State University

R291. Influence of Effective Length on the Directional Motion of Leidenfrost Droplets in Micro-Scale Ratchets

Poster Presentation: IMECE2023-119998
Jeong Tae Ok - Shawnee State University
Sunggook Park - Louisiana State University
Sheldon Wang - Midwestern State University
R292. Analysis of Electrochemical Capture of CO2 From Oceanwater Coupled With Hydrates-Based Seabed Sequestration

Poster Presentation: IMECE2023-120001
Mark Hamalian - The University of Texas at Austin
Awan Bhati - The University of Texas at Austin
Vaibhav Bahadur - The University of Texas at Austin

R293. Improving the Control of Fall Prevention Rehabilitation Device by Algorithmic Modification Through Testing

Poster Presentation: IMECE2023-120002
Devdas Shetty - University of the District of Columbia
Claudio Campana - University of Hartford
Lara Thompson - University of the District of Columbia
Pablo Sanchez - University of the District of Columbia


Poster Presentation: IMECE2023-120007
Titan Paul - University of South Carolina Aiken
Amitav Tikadar - Georgia Institute of Technology
Jamil Khan - University of South Carolina

R295. Investigating the Influence of Thermal Gradient on Mechanical Properties in FDM 3D Printing

Poster Presentation: IMECE2023-120030
Cori Yancy - Prairie View A&M University
Ethan Phillips - Prairie View A&M University
Rambod Rayegan - Prairie View A&M University
Jaejong Park - Prairie View A&M University

R296. Design and Optimization of a Cost-Effective Bioreactor for Biogas Production With Feedback Control System

Poster Presentation: IMECE2023-120046
Austen McKee - Tarleton State University

R297. Caterpillar-Inspired Soft Crawling Robot Driven by Distributed Programmable Thermal Actuation

Poster Presentation: IMECE2023-120048
Shuang Wu - North Carolina State University
Yaoye Hong - North Carolina State University
Yao Zhao - North Carolina State University
Jie Yin - North Carolina State University
Yong Zhu - North Carolina State University

R298. Multifunctional Sapphire Nanostructures Fabricated by Low RF Power ICP-RIE

Poster Presentation: IMECE2023-120061
Kun-Chieh Chien - The University of Texas at Austin
Chih-Hao Chang - The University of Texas at Austin
R299. Synthesis and Characterization of Sic-Mullite Thermal Material

Poster Presentation: IMECE2023-120065

Farjana Sultana - University of North Carolina at Charlotte
Ahmed El-Ghannam - University of North Carolina at Charlotte

R300. Leveraging in Vitro Model Systems to Assess Uterine Mechanobiology During Pregnancy

Poster Presentation: IMECE2023-111690

Isabella Claure - Boston University
Anika Joglekar - Boston University
Catherine Klapperich - Boston University
Joyce Wong - Boston University

R301. Optical Characterization and Modeling of Polycrystalline MoO3 Films Fabricated by Pulsed Laser Deposition

Poster Presentation: IMECE2023-120069

Chiyu Yang - Georgia Institute of Technology
Zhuomin Zhang - Georgia Institute of Technology
Maria Cristina Larciprete - Sapienza Università di Roma
Marco Centini - Sapienza Università di Roma
Roberto Macaluso - Università degli Studi di Palermo
Mauro Antezza - University of Montpellier

R302. Design for Manufacturing of Cemented Carbide Coated Components Toward High Wear and Impact Resistance Performance

Poster Presentation: IMECE2023-120106

M.K. Lei - Dalian University of Technology
X.P. Zhu - Dalian University of Technology
S.J. Zhang - Dalian University of Technology


Poster Presentation: IMECE2023-120130

Manish Neupane - The University of Maine
Yingchao Yang - The University of Maine

R304. Investigation of Particle Aggregation Behavior in Anti-Dust Nanostructures

Poster Presentation: IMECE2023-120145

Andrew Tunell - The University of Texas at Austin
Chih-Hao Chang - The University of Texas at Austin
Stephen Furst - Smart Material Solutions Inc.
Nichole Cates - Smart Material Solutions Inc.
Lauren Micklow - Smart Material Solutions Inc.
<table>
<thead>
<tr>
<th>Poster Number</th>
<th>Title</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Poster Presentation: IMECE2023-120162</strong></td>
<td></td>
</tr>
<tr>
<td>R306</td>
<td>Thermal Transport in Embedded Nanoparticle Composites: A Molecular Dynamics Study of the Optimal Size Distribution</td>
<td>Theodore Maranets - University of Nevada, Reno, Yan Wang - University of Nevada, Reno</td>
</tr>
<tr>
<td></td>
<td><strong>Poster Presentation: IMECE2023-120164</strong></td>
<td></td>
</tr>
<tr>
<td>R307</td>
<td>Review of the Customized Test Methods for the Biological-Materials: Conformity With the Laboratory Essentials</td>
<td>Satya Prasad Paruchuru - VNRVJIET, Tejaswi Chilukuri - VNRVJIET</td>
</tr>
<tr>
<td></td>
<td><strong>Poster Presentation: IMECE2023-120165</strong></td>
<td></td>
</tr>
<tr>
<td>R308</td>
<td>Multi-Functional Load Resistant Framework for the Unpredictably Worthy Applications: Manufacturing With Controlled Discontinuity Degree</td>
<td>Satya Prasad Paruchuru - VNRVJIET, Tapaswi Velamati - VNRVJIET</td>
</tr>
<tr>
<td></td>
<td><strong>Poster Presentation: IMECE2023-120170</strong></td>
<td></td>
</tr>
<tr>
<td>R309</td>
<td>A Construct for the Inter-Scientific Application and the Bioengineering-Structures: A Facilitating Means to Explore</td>
<td>Satya Prasad Paruchuru - VNRVJIET, Tejaswi Chilukuri - VNRVJIET</td>
</tr>
<tr>
<td></td>
<td><strong>Poster Presentation: IMECE2023-120186</strong></td>
<td></td>
</tr>
<tr>
<td>R310</td>
<td>Monitoring of Schedule Sensitive Industrial, Expedition, and Exploratory Systems: Perceptive Analysis, Evaluation, and Validation</td>
<td>Satya Prasad Paruchuru - VNRVJIET</td>
</tr>
<tr>
<td></td>
<td><strong>Poster Presentation: IMECE2023-120199</strong></td>
<td></td>
</tr>
<tr>
<td>R311</td>
<td>Multibody Dynamics Analysis of Lightweight Manipulators for Automated Ropeway Structure Inspection</td>
<td>Geunsu Song - Hanbat National University, Kwangbok Shin - Hanbat National University</td>
</tr>
<tr>
<td></td>
<td><strong>Poster Presentation: IMECE2023-111915</strong></td>
<td></td>
</tr>
<tr>
<td>R312</td>
<td>A Preventive Maintenance System for an Emerging Novel Industry: Requisites for an Effective Implementation</td>
<td>Satya Prasad Paruchuru - VNRVJIET, Gagan Paruchuru - Sri Chaitanya Junior College, KPHB</td>
</tr>
<tr>
<td></td>
<td><strong>Poster Presentation: IMECE2023-120205</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Poster Presentation: IMECE2023-120215</strong></td>
<td></td>
</tr>
</tbody>
</table>
R314. Lightweight Conductive Composite Network for Aircraft Lightning Strike Protection

**Poster Presentation:** IMECE2023-120221

Mohammad Uddin - North Carolina A&T State University
Israt Jahan - North Carolina A&T State University
Ram Mohan - North Carolina A&T State University
Ajit Kelkar - North Carolina A&T State University

R315. On-Chip Measurement of Near Field Heat Transfer Between Sub-Wavelength Structures

**Poster Presentation:** IMECE2023-120226

Xiao Luo - Carnegie Mellon University
Hakan Salihoglu - Carnegie Mellon University
Zexiao Wang - Carnegie Mellon University
Zhao Li - Carnegie Mellon University
Hyeonggyun Kim - Carnegie Mellon University
Jiayu Li - Carnegie Mellon University
Bowen Yu - Carnegie Mellon University
Sheng Shen - Carnegie Mellon University

R316. Essential Processes That Elevate Humans Into Super-Humans With Conduct: Life Systems as the Means

**Poster Presentation:** IMECE2023-120227

Satya Prasad Paruchuru - VNRVJET


**Poster Presentation:** IMECE2023-120232

Satya Prasad Paruchuru - VNRVJET
Aruna Prabha Kolluri - VNRVJET
Siva Kalyani Koneti - VNRVJET

R318. Thermal Transport in Gete PCM Based Reconfigurable Devices

**Poster Presentation:** IMECE2023-120235

Zexiao Wang - Carnegie Mellon University
Xiu Liu - Carnegie Mellon University
Hyeonggyun Kim - Carnegie Mellon University
Sheng Shen - Carnegie Mellon University


**Poster Presentation:** IMECE2023-120243

Satya Prasad Paruchuru - VNRVJET
Nidhi Saxena - VNRVJET


**Poster Presentation:** IMECE2023-120250

Satya Prasad Paruchuru - VNRVJET
Siva Kalyani Koneti - VNRVJET
Deepthi Jammula - VNRVJET

R321. Femtosecond Laser Sintering of Ti Nanoparticles

**Poster Presentation:** IMECE2023-120240

Janghan Park - The University of Texas at Austin
Yaguo Wang - The University of Texas at Austin
# COMMITTEE MEETINGS

## CONVENTION CENTER – IMECE 2023

<table>
<thead>
<tr>
<th>DATE</th>
<th>LOCATION</th>
<th>MEETING TITLE</th>
<th>START TIME</th>
<th>END TIME</th>
<th>ROOM#</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monday, October 30, 2023</td>
<td>Convention Center</td>
<td>Committee of Past Presidents</td>
<td>10:30 AM</td>
<td>1:30 PM</td>
<td>Room 188</td>
</tr>
<tr>
<td>Monday, October 30, 2023</td>
<td>Convention Center</td>
<td>Ethics of AI and Machine Learning – Interactive Workshop</td>
<td>10:30 AM</td>
<td>12:00 PM</td>
<td>Room 186</td>
</tr>
<tr>
<td>Monday, October 30, 2023</td>
<td>Convention Center</td>
<td>Fluids Engineering Division Townhall Meeting</td>
<td>1:00 PM</td>
<td>2:00 PM</td>
<td>Room 197</td>
</tr>
<tr>
<td>Monday, October 30, 2023</td>
<td>Convention Center</td>
<td>Management Division Executive Committee Meeting</td>
<td>1:00 PM</td>
<td>3:30 PM</td>
<td>Room 384</td>
</tr>
<tr>
<td>Monday, October 30, 2023</td>
<td>Convention Center</td>
<td>Material Division Technical Committee on Materials for Biometric and Medical Applications Meeting</td>
<td>3:00 PM</td>
<td>4:00 PM</td>
<td>Room 383</td>
</tr>
<tr>
<td>Monday, October 30, 2023</td>
<td>Convention Center</td>
<td>JTEA Editorial Meeting</td>
<td>4:00 PM</td>
<td>5:00 PM</td>
<td>Room 386</td>
</tr>
<tr>
<td>Monday, October 30, 2023</td>
<td>Convention Center</td>
<td>Women in ME and ASME</td>
<td>5:00 PM</td>
<td>7:00 PM</td>
<td>Room 396</td>
</tr>
<tr>
<td>Monday, October 30, 2023</td>
<td>Convention Center</td>
<td>Applied Mechanics Division - Fracture and Failure Mechanics Technical Committee</td>
<td>4:00 PM</td>
<td>5:30 PM</td>
<td>Room 391</td>
</tr>
<tr>
<td>Monday, October 30, 2023</td>
<td>Convention Center</td>
<td>CFD Technical Committee Meeting</td>
<td>6:00 PM</td>
<td>7:00 PM</td>
<td>Room 391</td>
</tr>
<tr>
<td>Monday, October 30, 2023</td>
<td>Convention Center</td>
<td>Biomedical and Biotechnology Track Organizers</td>
<td>6:00 PM</td>
<td>7:00 PM</td>
<td>Room 392</td>
</tr>
<tr>
<td>Monday, October 30, 2023</td>
<td>Convention Center</td>
<td>Material Division Technical Committee Meeting on Composites and Heterogeneous Materials</td>
<td>6:00 PM</td>
<td>7:00 PM</td>
<td>Room 383</td>
</tr>
<tr>
<td>Monday, October 30, 2023</td>
<td>Convention Center</td>
<td>ASME Aerospace Division Reception</td>
<td>6:00 PM</td>
<td>7:00 PM</td>
<td>Rooms 398-399</td>
</tr>
<tr>
<td>Monday, October 30, 2023</td>
<td>Convention Center</td>
<td>HTD K-23 Diversity, Equity, and Inclusion Committee Meeting</td>
<td>6:00 PM</td>
<td>7:30 PM</td>
<td>Room 393</td>
</tr>
<tr>
<td>Monday, October 30, 2023</td>
<td>Convention Center</td>
<td>HTD K-6 Heat Transfer in Energy Systems Committee Meeting</td>
<td>6:00 PM</td>
<td>7:30 PM</td>
<td>Room 388</td>
</tr>
<tr>
<td>Monday, October 30, 2023</td>
<td>Convention Center</td>
<td>HTD K-12 Aerospace Heat Transfer Technical Committee Meeting</td>
<td>6:00 PM</td>
<td>7:30 PM</td>
<td>Room 394</td>
</tr>
<tr>
<td>Monday, October 30, 2023</td>
<td>Convention Center</td>
<td>JHMT Editorial Meeting</td>
<td>6:00 PM</td>
<td>8:00 PM</td>
<td>Room 386</td>
</tr>
</tbody>
</table>
## COMMITTEE MEETINGS

<table>
<thead>
<tr>
<th>DATE</th>
<th>LOCATION</th>
<th>MEETING TITLE</th>
<th>START TIME</th>
<th>END TIME</th>
<th>ROOM#</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>MONDAY</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mon., October 30, 2023</td>
<td>Convention Center</td>
<td>ASME MEMS Division Meeting</td>
<td>6:00 PM</td>
<td>7:30 PM</td>
<td>Room 389</td>
</tr>
<tr>
<td>Mon., October 30, 2023</td>
<td>Convention Center</td>
<td>ASME X-20 committee in Computational Heat Transfer</td>
<td>6:00 PM</td>
<td>8:00 PM</td>
<td>Room 390</td>
</tr>
<tr>
<td>Mon., October 30, 2023</td>
<td>Convention Center</td>
<td>ASME Structures and Materials TC meeting</td>
<td>6:30 PM</td>
<td>9:00 PM</td>
<td>Room 395</td>
</tr>
<tr>
<td>Mon., October 30, 2023</td>
<td>Convention Center</td>
<td>Materials Division Technical Committee Meeting on Advanced Materials for Energy</td>
<td>7:00 PM</td>
<td>8:00 PM</td>
<td>Room 397</td>
</tr>
<tr>
<td>Mon., October 30, 2023</td>
<td>Convention Center</td>
<td>Multiphase Flow Technical Committee Meeting</td>
<td>7:00 PM</td>
<td>8:00 PM</td>
<td>Room 384</td>
</tr>
<tr>
<td>Mon., October 30, 2023</td>
<td>Convention Center</td>
<td>Fluid Measurement and Instrumentation Technical Committee Meeting</td>
<td>8:00 PM</td>
<td>9:00 PM</td>
<td>Room 384</td>
</tr>
<tr>
<td><strong>TUESDAY</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tue., October 31, 2023</td>
<td>Convention Center</td>
<td>Executive Committee of the Applied Mechanics Division</td>
<td>9:00 AM</td>
<td>12:00 PM</td>
<td>Room 383</td>
</tr>
<tr>
<td>Tue., October 31, 2023</td>
<td>Convention Center</td>
<td>Heat Transfer Division Awards Luncheon</td>
<td>12:00 PM</td>
<td>1:30 PM</td>
<td>Room 391-92</td>
</tr>
<tr>
<td>Tue., October 31, 2023</td>
<td>Convention Center</td>
<td>Award Meeting of the Applied Mechanics Division</td>
<td>12:00 PM</td>
<td>4:30 PM</td>
<td>Room 386</td>
</tr>
<tr>
<td>Tue., October 31, 2023</td>
<td>Convention Center</td>
<td>Technical Committee Meeting for &quot;Mechanics of Soft Materials&quot;</td>
<td>1:00 PM</td>
<td>2:00 PM</td>
<td>Room 384</td>
</tr>
<tr>
<td>Tue., October 31, 2023</td>
<td>Convention Center</td>
<td>Fluid Mechanics Technical Committee Meeting</td>
<td>1:00 PM</td>
<td>2:00 PM</td>
<td>Room 383</td>
</tr>
<tr>
<td>Tue., October 31, 2023</td>
<td>Convention Center</td>
<td>AMD Committee on Computing in Applied Mechanics (CONCAM)</td>
<td>1:00 PM</td>
<td>2:00 PM</td>
<td>Room 388</td>
</tr>
<tr>
<td>Tue., October 31, 2023</td>
<td>Convention Center</td>
<td>Fluids Engineering Division Honors &amp; Awards Committee Meeting</td>
<td>2:00 PM</td>
<td>3:00 PM</td>
<td>Room 383</td>
</tr>
<tr>
<td>Tue., October 31, 2023</td>
<td>Convention Center</td>
<td>Advanced Energy Systems Division Lecture &amp; Reception</td>
<td>4:00 PM</td>
<td>5:30 PM</td>
<td>Room 389</td>
</tr>
<tr>
<td>Tue., October 31, 2023</td>
<td>Convention Center</td>
<td>Materials Division Technical Committee Meeting on Electronic Materials</td>
<td>4:30 PM</td>
<td>5:30 PM</td>
<td>Room 384</td>
</tr>
<tr>
<td>Tue., October 31, 2023</td>
<td>Convention Center</td>
<td>ASME Nanotechnology Group Annual Meeting</td>
<td>5:00 PM</td>
<td>6:00 PM</td>
<td>Room 386</td>
</tr>
</tbody>
</table>
## COMMITTEE MEETINGS

<table>
<thead>
<tr>
<th>DATE</th>
<th>LOCATION</th>
<th>MEETING TITLE</th>
<th>START TIME</th>
<th>END TIME</th>
<th>ROOM#</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tuesday, October 31, 2023</td>
<td>Convention Center</td>
<td>Noise Control and Acoustics Division: General Committee Meeting</td>
<td>7:30 PM</td>
<td>8:30 PM</td>
<td>Room 398</td>
</tr>
<tr>
<td>Tuesday, October 31, 2023</td>
<td>Convention Center</td>
<td>Advanced Energy Systems Division Executive Committee Meeting</td>
<td>8:00 PM</td>
<td>9:00 PM</td>
<td>Room 388</td>
</tr>
<tr>
<td>Wednesday, November 1, 2023</td>
<td>Convention Center</td>
<td>Fluid Application and System Technical Committee Meeting</td>
<td>1:00 PM</td>
<td>2:00 PM</td>
<td>Room 383</td>
</tr>
<tr>
<td>Wednesday, November 1, 2023</td>
<td>Convention Center</td>
<td>Panel: Frontiers of Manufacturing: In-Process Nondestructive Evaluation</td>
<td>2:00 PM</td>
<td>6:00 PM</td>
<td>Room 388</td>
</tr>
<tr>
<td>Wednesday, November 1, 2023</td>
<td>Convention Center</td>
<td>Micro-Nano-Fluid Dynamics Technical Committee Meeting</td>
<td>2:00PM</td>
<td>3:00 PM</td>
<td>Room 383</td>
</tr>
<tr>
<td>Wednesday, November 1, 2023</td>
<td>Convention Center</td>
<td>Fluids Engineering Division Graduate Student Scholar Committee Meeting</td>
<td>3:00PM</td>
<td>4:00 PM</td>
<td>Room 383</td>
</tr>
<tr>
<td>Wednesday, November 1, 2023</td>
<td>Convention Center</td>
<td>Materials Division Awards Symposium and Reception</td>
<td>3:00 PM</td>
<td>6:00 PM</td>
<td>Room 395</td>
</tr>
<tr>
<td>Wednesday, November 1, 2023</td>
<td>Convention Center</td>
<td>AMD/MD Joint Technical Committee Meeting on Constitutive Equations</td>
<td>4:00 PM</td>
<td>5:00 PM</td>
<td>Room 384</td>
</tr>
<tr>
<td>Wednesday, November 1, 2023</td>
<td>Convention Center</td>
<td>Noise Control and Acoustics Division: Rayleigh Lecture</td>
<td>4:00 PM</td>
<td>5:30 PM</td>
<td>Room 389</td>
</tr>
<tr>
<td>Wednesday, November 1, 2023</td>
<td>Convention Center</td>
<td>VVUQ 20 Subcommittee on Verification, Validation, and Uncertainty Quantification in Computational Fluid Dynamics and Heat Transfer</td>
<td>6:00 PM</td>
<td>9:00 PM</td>
<td>Room 383</td>
</tr>
<tr>
<td>Wednesday, November 1, 2023</td>
<td>Convention Center</td>
<td>Material Division Technical Committee Meeting on Design of Engineering Materials</td>
<td>6:00 PM</td>
<td>7:30 PM</td>
<td>Room 384</td>
</tr>
<tr>
<td>Wednesday, November 1, 2023</td>
<td>Convention Center</td>
<td>HTD K-15 Transport Phenomena in Manufacturing and Material Processing Committee Meeting</td>
<td>6:00 PM</td>
<td>7:30 PM</td>
<td>Room 390</td>
</tr>
<tr>
<td>Wednesday, November 1, 2023</td>
<td>Convention Center</td>
<td>Fluids Engineering Division Advisory Committee Meeting</td>
<td>6:00 PM</td>
<td>7:00 PM</td>
<td>Room 194</td>
</tr>
<tr>
<td>Wednesday, November 1, 2023</td>
<td>Convention Center</td>
<td>HTD K-9 Nanoscale Thermal Transport Technical Committee Meeting</td>
<td>6:00 PM</td>
<td>7:30 PM</td>
<td>Room 196</td>
</tr>
<tr>
<td>Wednesday, November 1, 2023</td>
<td>Convention Center</td>
<td>BDPD Executive Committee Meeting</td>
<td>6:00 PM</td>
<td>8:00 PM</td>
<td>Room 393</td>
</tr>
<tr>
<td>Wednesday, November 1, 2023</td>
<td>Convention Center</td>
<td>Track 3 Advanced Manufacturing Meeting</td>
<td>6:00 PM</td>
<td>8:00 PM</td>
<td>Room 186</td>
</tr>
<tr>
<td>Wednesday, November 1, 2023</td>
<td>Convention Center</td>
<td>Fluids Engineering Division Executive Committee Meeting with Technical Committee Chairs</td>
<td>7:00 PM</td>
<td>8:00 PM</td>
<td>Room 394</td>
</tr>
</tbody>
</table>
## COMMITTEE MEETINGS

<table>
<thead>
<tr>
<th>DATE</th>
<th>LOCATION</th>
<th>MEETING TITLE</th>
<th>START TIME</th>
<th>END TIME</th>
<th>ROOM#</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wednesday, November 1</td>
<td>Convention Center</td>
<td>with Technical Committee Chairs</td>
<td>7:00 PM</td>
<td>8:00 PM</td>
<td>Room 394</td>
</tr>
<tr>
<td>Wednesday, November 1</td>
<td>Convention Center</td>
<td>Fluids Engineering Division Executive Committee Meeting</td>
<td>8:00 PM</td>
<td>9:00 PM</td>
<td>Room 394</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>THURSDAY</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thursday, November 2</td>
<td>Convention Center</td>
<td>Materials Division Joint Executive Committee and Technical Committee Meeting (Open Meeting)</td>
<td>10:30 AM</td>
<td>12:00 PM</td>
<td>Room 388</td>
</tr>
<tr>
<td>Thursday, November 2</td>
<td>Convention Center</td>
<td>Industry at IMECE: Benefits and Involvement</td>
<td>10:30 AM</td>
<td>11:30 AM</td>
<td>Room 389</td>
</tr>
<tr>
<td>Thursday, November 2</td>
<td>Convention Center</td>
<td>Noise Control and Acoustics Division: Executive Committee Meeting (Closed)</td>
<td>12:30 PM</td>
<td>2:00 PM</td>
<td>Room 388</td>
</tr>
<tr>
<td>Thursday, November 2</td>
<td>Convention Center</td>
<td>Materials Division Executive Committee Meeting (Closed)</td>
<td>2:00 PM</td>
<td>3:30 PM</td>
<td>Room 390</td>
</tr>
<tr>
<td>DATE</td>
<td>LOCATION</td>
<td>MEETING TITLE</td>
<td>START TIME</td>
<td>END TIME</td>
<td>ROOM NAME</td>
</tr>
<tr>
<td>--------------------------</td>
<td>----------------</td>
<td>------------------------------------------------------------------------------</td>
<td>------------</td>
<td>------------</td>
<td>----------------------------</td>
</tr>
<tr>
<td>Saturday, October 28, 2023</td>
<td>Hilton</td>
<td>Registration</td>
<td>7:00 AM</td>
<td>5:00 PM</td>
<td>Jefferson Foyer, Third Fl.</td>
</tr>
<tr>
<td>Saturday, October 28, 2023</td>
<td>Hilton</td>
<td>Technical Committee on Publications &amp; Communications (TCPC)</td>
<td>8:00 AM</td>
<td>12:00 PM</td>
<td>Parish, Third Fl.</td>
</tr>
<tr>
<td>Saturday, October 28, 2023</td>
<td>Hilton</td>
<td>TEC Sector Council Meeting</td>
<td>9:00 AM</td>
<td>5:00 PM</td>
<td>Durham, Third Fl.</td>
</tr>
<tr>
<td>Saturday, October 28, 2023</td>
<td>Hilton</td>
<td>Joint Editors-in-Chief (EIC) / Technical Committee on Publications &amp; Communications (TCPC)</td>
<td>12:00 PM</td>
<td>5:00 PM</td>
<td>Parish, Third Fl.</td>
</tr>
<tr>
<td>Sunday, October 29, 2023</td>
<td>Hilton</td>
<td>Registration</td>
<td>7:00 AM</td>
<td>5:00 PM</td>
<td>Jefferson Foyer, Third Fl.</td>
</tr>
<tr>
<td>Sunday, October 29, 2023</td>
<td>Hilton</td>
<td>Board of Governors Meeting</td>
<td>8:00 AM</td>
<td>3:00 PM</td>
<td>Jefferson Ballroom, Third Fl.</td>
</tr>
<tr>
<td>Sunday, October 29, 2023</td>
<td>Hilton</td>
<td>TEC Sector Council Meeting (CLOSED)</td>
<td>9:00 AM</td>
<td>12:30 PM</td>
<td>Durham, Third Fl.</td>
</tr>
<tr>
<td>Sunday, October 29, 2023</td>
<td>Hilton</td>
<td>Journal Editor-in-Chief Workshop</td>
<td>9:30 AM</td>
<td>12:00 PM</td>
<td>Ascot/Newberry, Third Fl.</td>
</tr>
<tr>
<td>Sunday, October 29, 2023</td>
<td>Hilton</td>
<td>Heat Transfer Division Executive Committee Meeting (Closed)</td>
<td>12:30 PM</td>
<td>2:30 PM</td>
<td>Ascot/Newberry, Third Fl.</td>
</tr>
<tr>
<td>Sunday, October 29, 2023</td>
<td>Hilton</td>
<td>TEC Townhall Meeting (OPEN)</td>
<td>1:00 PM</td>
<td>3:00 PM</td>
<td>Durham, Third Fl.</td>
</tr>
<tr>
<td>Sunday, October 29, 2023</td>
<td>Hilton</td>
<td>Heat Transfer Division Executive Committee Meeting (Open)</td>
<td>3:00 PM</td>
<td>5:00 PM</td>
<td>Ascot/Newberry, Third Fl.</td>
</tr>
<tr>
<td>Sunday, October 29, 2023</td>
<td>Hilton</td>
<td>Fluids Engineering Division Executive Committee Meeting</td>
<td>3:00 PM</td>
<td>4:00PM</td>
<td>Norwich, Third Fl.</td>
</tr>
<tr>
<td>Sunday, October 29, 2023</td>
<td>Hilton</td>
<td>Fluids Engineering Division Executive Committee meeting with Technical Committee Chairs</td>
<td>4:00PM</td>
<td>5:00PM</td>
<td>Norwich, Third Fl.</td>
</tr>
<tr>
<td>Sunday, October 29, 2023</td>
<td>Hilton</td>
<td>Business Meeting</td>
<td>4:00 PM</td>
<td>4:30 PM</td>
<td>Jefferson Ballroom, Third Fl.</td>
</tr>
<tr>
<td>Tuesday - Thursday</td>
<td>Hilton</td>
<td>ASME Information Desk</td>
<td>6:30 AM</td>
<td>11:00 AM</td>
<td>On first floor opposite the escalator</td>
</tr>
</tbody>
</table>
Sponsors & Exhibitor Program
THANK YOU SPONSORS FOR THE SUPPORT OF THE CONFERENCE

(GOLD SPONSOR)

(DASSAULT SYSTEMES)

(SILVER SPONSOR)

(MathWorks®)

(LANYARD SPONSOR)

(VOYEUR...

(COLLEGE OF ENGINEERING MECHANICAL ENGINEERING VIRGINIA TECH)

(NAME BADGE INSERT SPONSOR)

(FAMU-FSU College of Engineering)

(ATTENDEE BAG INSERT SPONSOR)

(SCHOTT)

(POSTER SESSION SPONSOR)
<table>
<thead>
<tr>
<th>Exhibitor</th>
<th>Booth #</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASME Louisiana Section</td>
<td>421</td>
</tr>
<tr>
<td>Blockpad</td>
<td>422</td>
</tr>
<tr>
<td>Cambridge University Press</td>
<td>706</td>
</tr>
<tr>
<td>Clemson University</td>
<td>613</td>
</tr>
<tr>
<td>Colorado School of Mines</td>
<td>617</td>
</tr>
<tr>
<td>Dassault Systems</td>
<td>423</td>
</tr>
<tr>
<td>Drexel University</td>
<td>323</td>
</tr>
<tr>
<td>George Mason University</td>
<td>620</td>
</tr>
<tr>
<td>MathWorks</td>
<td>607</td>
</tr>
<tr>
<td>More Than Engineering</td>
<td>319</td>
</tr>
<tr>
<td>New York University Tandon School of Engineering</td>
<td>518</td>
</tr>
<tr>
<td>North Carolina State University</td>
<td>523</td>
</tr>
<tr>
<td>PTC</td>
<td>521</td>
</tr>
<tr>
<td>Rochester Institute of Technology</td>
<td>418</td>
</tr>
<tr>
<td>TecQuipment, Ltd</td>
<td>623</td>
</tr>
<tr>
<td>Texas A&amp;M University</td>
<td>611</td>
</tr>
<tr>
<td>The Ohio State University</td>
<td>622</td>
</tr>
<tr>
<td>The University of Tennessee – Oak Ridge Innovation Institute</td>
<td>520</td>
</tr>
<tr>
<td>University of the District of Columbia</td>
<td>419</td>
</tr>
<tr>
<td>University of Wisconsin – Platteville</td>
<td>619</td>
</tr>
<tr>
<td>USC Viterbi School of Engineering</td>
<td>615</td>
</tr>
<tr>
<td>Virginia Commonwealth University</td>
<td>707</td>
</tr>
<tr>
<td>Virginia Tech Mechanical Engineering</td>
<td>522</td>
</tr>
</tbody>
</table>
EXHIBIT SPONSORS

ASME Section (Booth 421)
www.asme.org

ASME Professional Sections provide an avenue for all members to connect at the local level. Sections augment and further Society-level programs and activities, including professional development programs, networking opportunities, and communicating the excitement of engineering through awards, recognitions and other activities. Each ASME member is assigned to a local section (if available), based on their geographic location. If you are in the Louisiana area, stop by for information on your Section.

Blockpad (Booth 422)
blockpad.net

Blockpad is calculation document software for engineering. It features spreadsheet-like functionality in a word processing environment, with named variables, units intelligence, and math notation display. Blockpad enables engineers to create professional calculation deliverables in an intuitive and familiar way.

Cambridge University Press (Booth 706)
https://www.cambridge.org/us/universitypress

Cambridge University Press is a not-for-profit publisher that dates from 1534. We are part of the University of Cambridge and our mission is to unlock people’s potential with the best learning and research solutions. Visit our stand to discuss publishing with us, browse our publications and get a 30% discount.
**Clemson University (Booth 613)**  **HIRING**
https://www.clemson.edu/cecas/

Clemson University’s College of Engineering, Computing, and Applied Sciences (CECAS), Department of Mechanical Engineering, and Department of Industrial Engineering are innovators in graduate education for industry professionals, engaged in cutting edge research, and form a robust network of students and scholars across multiple campuses. Together we engage with industry, collaborate with other institutions, and partner with government agencies to develop and disseminate new knowledge related to 21st century challenges.

**Colorado School of Mines (Booth 617)**
https://www.mines.edu/graduate-admissions/

If you are ready to continue your education, enhance your research experiences and connect with world-class faculty and industry experts, Colorado School of Mines offers an extensive list of graduate programs to help you achieve your academic and professional goals. You’ll be inspired to further enhance your skills as an innovator, expert and entrepreneur, and to address the greatest challenges that face our planet and beyond.

**Dassault Systems (Booth 423)**
https://www.3ds.com/

Dassault Systèmes provides business and people with virtual universes to imagine sustainable innovations capable of harmonizing product, nature and life.
Drexel University (Booth 323)
https://drexel.edu/engineering/academics/departments/mechanical-engineering/

A Carnegie R1 comprehensive research institution founded in 1891 & a leader in experiential learning through its cooperative educational model. Mechanical Engineering and Mechanics is home to innovation in biomechanics, machine learning, biological controls, & battery technologies, to plasma science, & materials for energy-efficient devices and infrastructure. With support of industry partnerships, MEM is fostering a highly engaged educational ecosystem for the next generation of mechanical engineers.

George Mason University (Booth 620)
https://mechanical.gmu.edu

The Department of Mechanical Engineering at George Mason University was founded in 2015 and has rapidly grown to an undergraduate enrollment of 400 students. Faculty and graduate students pursue research in a range of disciplines, including microfabrication, quantum engineering, robotics, additive manufacturing, materials science, tribology, computational and experimental fluids, etc. Through instruction, research, and service, we use mechanical engineering to make contributions beneficial to our communities and society at large.
**MathWorks (Booth 607)**
https://www.mathworks.com/

The MATLAB and Simulink product families are fundamental applied math and computational tools adopted by more than 6,500 universities and colleges. MathWorks products help prepare students for careers in industry, where the tools are widely used for data analysis, mathematical modeling, and algorithm development in collaborative research and new product development.

**More Than Engineering (Booth 319)**
jeff-perry.com

Jeff Perry is a leadership and career expert known for helping individuals, teams, and organizations unlock their potential, specializing in working with engineering and technical professionals. Got a career or leadership question? Come ask him! Jeff is the author of the new book, The Intentional Engineer.

You can reach Jeff on LinkedIn at https://www.linkedin.com/in/jeffcperry or learn more at jeff-perry.com.

**New York University Tandon School of Engineering (Booth 518)**
https://engineering.nyu.edu

Extraordinary achievement, high-caliber research, and a boundless global perspective are the hallmarks of the programs offered at the NYU Tandon School of Engineering. Located in the Brooklyn Tech Triangle, the NYU Tandon School of Engineering is a major player in New York City’s booming tech landscape. In this high-energy business epicenter, you’ll connect to pioneering organizations, from creative startups to world leaders in technology, media, and engineering.
NC STATE UNIVERSITY

North Carolina State University (Booth 523)
https://www.ncsu.edu/

North Carolina State University (NC State) began as a land-grant institution grounded in agriculture and engineering in Raleigh, NC. Today, the university is a powerhouse in science, technology, engineering and math, focusing on real-world solutions for real-world problems. NC State is dedicated to excellent teaching, creation and application of knowledge, and engagement with public and private partners.

PTC (Booth 521)
https://www.onshape.com/edu

The fastest moving industries trust Onshape for agile design, leveraging its unique collaborative capabilities to innovate faster. As a cloud-native CAD system, Onshape is accessible on any web browser, allowing users to collaborate on their designs in real-time from anywhere, on any device, without ever needing to install software. Whether you are working in a professional team, with a team of students, or in the classroom, Onshape can streamline your design activities.

Rochester Institute of Technology (Booth 418) **HIRING**
www.rit.edu/engineering/mechanicalengineering

RIT’s mechanical engineering department offers a solid foundation in mechanical engineering fundamentals with options for students to concentrate their studies in several specific areas of engineering. Well-equipped labs and facilities offer students the opportunity to build models and prototypes to demonstrate particular engineering design concepts. Experimentation and research are encouraged and there are opportunities for students to enrich their undergraduate and graduate experience by engaging in faculty-led research in areas such as sustainable energy systems, biomedical and assistive device technology, systems analysis, robotics, vibrations, and automotive and aerospace engineering.
TecQuipment (Booth 623)
www.TecQuipment.com

TecQuipment is the leading provider of high-quality practical teaching equipment for a range of engineering disciplines. Founded in 1958, the company prides itself on providing high-quality engineering equipment that is used by over 1,500 customers worldwide. The products allow students and educators to perform practical experiments to illustrate engineering principles and prepare students with highly sought-after skills required for the engineering labour market.

Texas A&M University (Booth 611)
https://engineering.tamu.edu/mechanical/index.html

The J. Mike Walker ’66 Department of Mechanical Engineering pushes the frontier of engineering innovation as it strives toward Texas A&M University’s mission as a land-, sea-, and space-grant institution, seeking to meet the needs of society and improve lives. With globally recognized programs and outstanding faculty including seven NAE members, the MEEN department features diverse research areas such as advanced manufacturing, rotating machinery, robotics/mechatronics, micro/nanosystems, energy/environment, and biomechanics/human health.

The Ohio State University (Booth 622)
https://mae.osu.edu/graduate/programs-overview

Discover innovation at The Ohio State University’s Department of Mechanical and Aerospace Engineering. We offer master’s and doctoral degrees in mechanical, nuclear, and aerospace engineering, with a proud emphasis on extensive research programs. Our faculty advocate collaboration between academia, industry, and government to drive true innovation. Stop by our booth to explore our programs and research for an enriching experience!
The University of Tennessee  (Booth 520)  **HIRING**
https://bredesencenter.utk.edu/
https://utorii.com/smart-internships/

The UT-Oak Ridge Innovation Institute offers three research PhD programs (Energy Science & Engineering, Data Science & Engineering, and Genome Science & Technology) that fully utilize the academic resources of the University of Tennessee and the research capabilities of Oak Ridge National Laboratory. All admitted students are fully-funded through tuition-waiver, health insurance, and a first-year fellowship beginning at $30,000. We also offer the SMaRT Summer Internship Program for undergraduate students.

University of District of Columbia  (Booth 419)
http://www.udc.edu

UDC is one of only four universities in the nation’s capital providing ABET-accredited undergraduate degrees in engineering and computer science, and graduate degrees in selected areas. Our curriculum focuses technological and scientific competence, balance between theory and practice, and consideration of the societal and holistic aspects of engineering. The primary mission is to prepare professionals and leaders committed to making their communities, countries, and the world a better place.

University of Wisconsin  (Booth 619)
Go.UWPlatt.edu/Engineering

The University of Wisconsin-Platteville has been educating engineers for more than 100 years, earning a national reputation as a prestigious institution. With our engineering degree programs and degrees in computer science, mathematics, and more, we prepare students for careers in highly-paid, growing fields.
USC Viterbi School of Engineering (Booth 615)
https://viterbischool.usc.edu/

USC, Viterbi School of Engineering’s online delivery method, DEN@Viterbi, is consistently ranked amongst the Top 10 Best Online Graduate Engineering Programs by U.S. News & World Report. USC Viterbi offers 40+ graduate engineering and computer science programs entirely online including the M.S. in Mechanical Engineering which is designed to provide engineering professionals with the technical education needed in various industries such as aerospace, automotive, utilities, and transportation.

Virginia Tech Mechanical (Booth 522) **HIRING**
https://me.vt.edu/

The Virginia Tech Department of Mechanical Engineering integrates cutting-edge engineering principles, hands-on projects, and open-ended problem solving in a team environment to bring excellence to teaching, research, and scholarship. Our department serves students, alumni, and our local and global community by maintaining the highest standards for the programs that we use to prepare tomorrow’s engineers for tomorrow’s challenges in industry, government, and academia.
MATLAB FOR AI

Boost system design and simulation with explainable and scalable AI. With MATLAB and Simulink, you can easily train and deploy AI models.

mathworks.com/ai
Submit an abstract for these upcoming ASME Conferences:

- **Aerospace Structures, Structural Dynamics & Materials Conference (SSDM) 2024**
  Hyatt Regency Lake Washington At Seattle's Southport
  Renton, WA
  April 29 – May 1, 2024
  Abstracts for Presentation Only: Due, January 8, 2024
  [https://event.asme.org/SSDM](https://event.asme.org/SSDM)

- **International Symposium on Flexible Automation (ISFA) 2024**
  University of Washington
  Seattle, WA
  July 24–26, 2024
  Abstract deadline: February 12, 2024
  [https://event.asme.org/ISFA](https://event.asme.org/ISFA)

- **SHTC/ES/FEDSM 2024**
  Hilton Anaheim
  Anaheim, CA
  July 15-17
  Abstract deadline: November 6, 2024
  [https://event.asme.org/SHTC](https://event.asme.org/SHTC)
  [https://event.asme.org/ES](https://event.asme.org/ES)
  [https://event.asme.org/FEDSM](https://event.asme.org/FEDSM)

- **International Design Engineering Technical Conferences & Computers and Information in Engineering Conference (IDETC/CIB) 2024**
  JW Marriott Washington
  Washington, DC
  August 25–28, 2024
  Abstract deadline: March 18, 2024
  [https://event.asme.org/IDETC](https://event.asme.org/IDETC)
  [https://event.asme.org/CIB](https://event.asme.org/CIB)

- **International Pipeline Conference (IPC) 2024**
  Calgary, AB, Canada
  September 23 – 27, 2024
  Abstract deadline: December 4, 2023
  [https://event.asme.org/IPC](https://event.asme.org/IPC)

- **Bolted Joint Reliability Symposium (BJRS) 2024**
  Norris Conference Center
  Houston, TX
  Abstract deadline: July 14, 2024
  [https://event.asme.org/BJRS](https://event.asme.org/BJRS)

- **7th ASME International Conference of Micro/Nanoscale Heat and Mass Transfer (MNHMT 2024)**
  University of Nottingham
  Nottingham, United Kingdom
  August 5-7, 2024
  Abstract deadline: November 20, 2023
  [https://event.asme.org/MNHMT](https://event.asme.org/MNHMT)

Register for these ASME conferences:

- **Conference for Advanced Reactor Deployment (CARD) 2024**
  EPRI
  Charlotte, NC
  March 26-28, 2024
  [https://event.asme.org/CARD](https://event.asme.org/CARD)

- **OMAE 2024 & 3rd International Conference on Ocean, Offshore & Arctic Engineering**
  Singapore Expo
  Singapore
  June 9-14, 2024
  [https://event.asme.org/OMAE](https://event.asme.org/OMAE)

- **Turbo Expo 2024**
  The ExCeL
  London, England, United Kingdom
  June 24-28, 2024
  [https://event.asme.org/Turbo-Expo](https://event.asme.org/Turbo-Expo)

- **Pressure Vessels & Piping Conference (PVP) 2024**
  Hyatt Regency Bellevue
  Bellevue, WA
  July 28 – August 2, 2024
  [https://event.asme.org/PVP](https://event.asme.org/PVP)
See you Portland, OR in 2024!

https://event.asme.org/IMECE