# ASME IMECE® 2023
## International Mechanical Engineering Congress & Exposition®

# Program

https://event.asme.org/IMECE

The American Society of Mechanical Engineers®
ASME®

ASME
SETTING THE STANDARD

**City of New Orleans**
Mayor LaToya Cantrell

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

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## CONTENTS

**IMECE**® ONE GREAT LEARNING EXPERIENCE.
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# WELCOME FROM THE CHAIRS

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

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

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**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 Kardomateas**
*Steering Committee Senate Member*
*Georgia Institute of Technology*

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

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

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

**Ying Sun**
*Member at Large*
*Vanderbilt University*

**Caterina Rizzi**
*Member at Large*
*Università degli Studi di Bergamo*

**Wenbin Yu**
*Member at Large*
*Purdue University*

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# General Imformation

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## GENERAL INFORMATION

**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.

**ASME SWAPCARD APP**

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

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## GENERAL INFORMATION

### 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 |

### 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.

### 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**
www.dependablecare.net
Phone: (504) 486-5044

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### 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:

**Monday, October 30**          7:30AM – 8:00AM

**Tuesday, October 31**          7:30AM – 8:00AM

**Wednesday, November 1**     7:30AM – 8:30AM

**Thursday, November 2**        7:30AM – 8:00AM *\*\*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.**

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### 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** 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.

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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.

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### 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.*

### WI-FI

Free Wi-Fi access is provided to IMECE conference attendees throughout the **New Orleans Ernest N. Morial Convention Center**.

New Orleans Ernest N. Morial Convention Center

Network: IMECE
Password: imece2023

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## GENERAL INFORMATION

### 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 |

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### 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/**

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## GENERAL INFORMATION

### 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.*

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**Tuesday, October 31,**   9:30AM – 12:00PM

### LAKE BORGNE 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.*

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**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
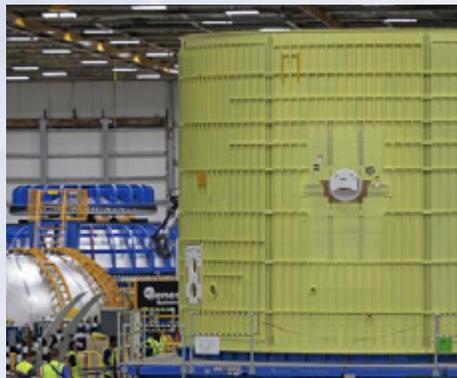


**Description:** Visitors to the Michoud Assembly Facility can observe production of NASA's Artemis Program's Space Launch System. Technicians use state-of-the-art manufacturing and welding equipment — including a friction-stir-welding tool that is the largest of its kind in the world- to manufacture 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.*

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## GENERAL INFORMATION

### 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 and 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 l/2-inch gage track that was adopted in 1929.



### LANDMARK LOCATION

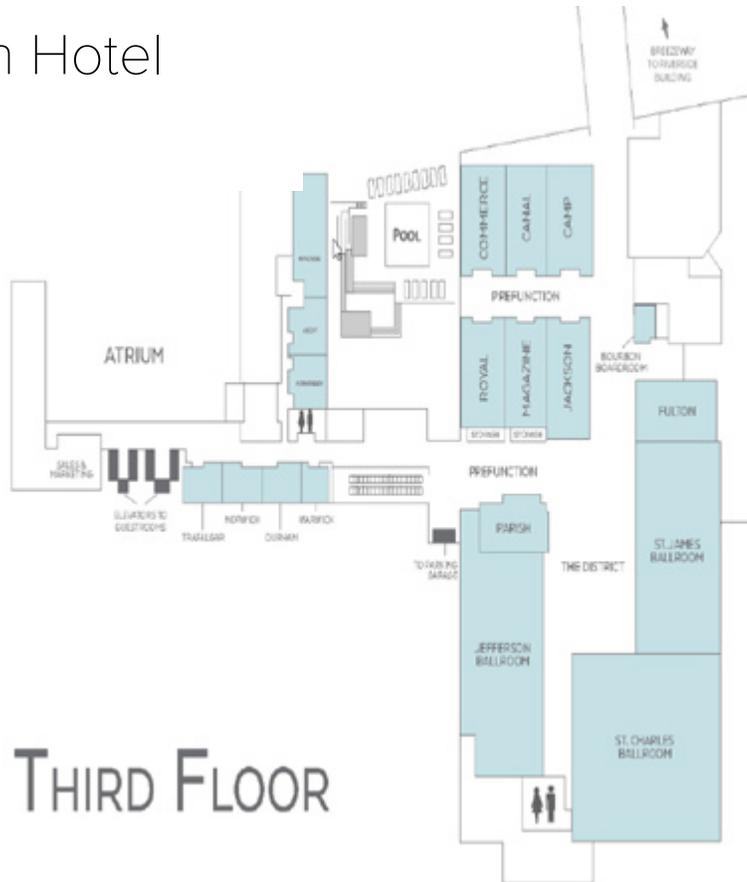**Regional Transit Authority of New Orleans**
New Orleans, LA

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

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## FLOOR PLAN

Hilton Hotel



THIRD FLOOR

FIRST FLOOR

**Legend:**
- GREEN ROOM
- FLOOR BELOW
- FREIGHT ELEVATOR
- ATM
- ESCALATOR
- IRIS POD
- PASSENGER ELEVATOR
- RESTROOM
- SERVICE SPACE
- STAIRS

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## FLOOR PLAN

Hilton Hotel

SECOND FLOOR



- GREEN ROOM
- FLOOR BELOW
- FREIGHT ELEVATOR
- ATM
- ESCALATOR
- IRIS POD
- PASSENGER ELEVATOR
- RESTROOM
- SERVICE SPACE
- STAIRS

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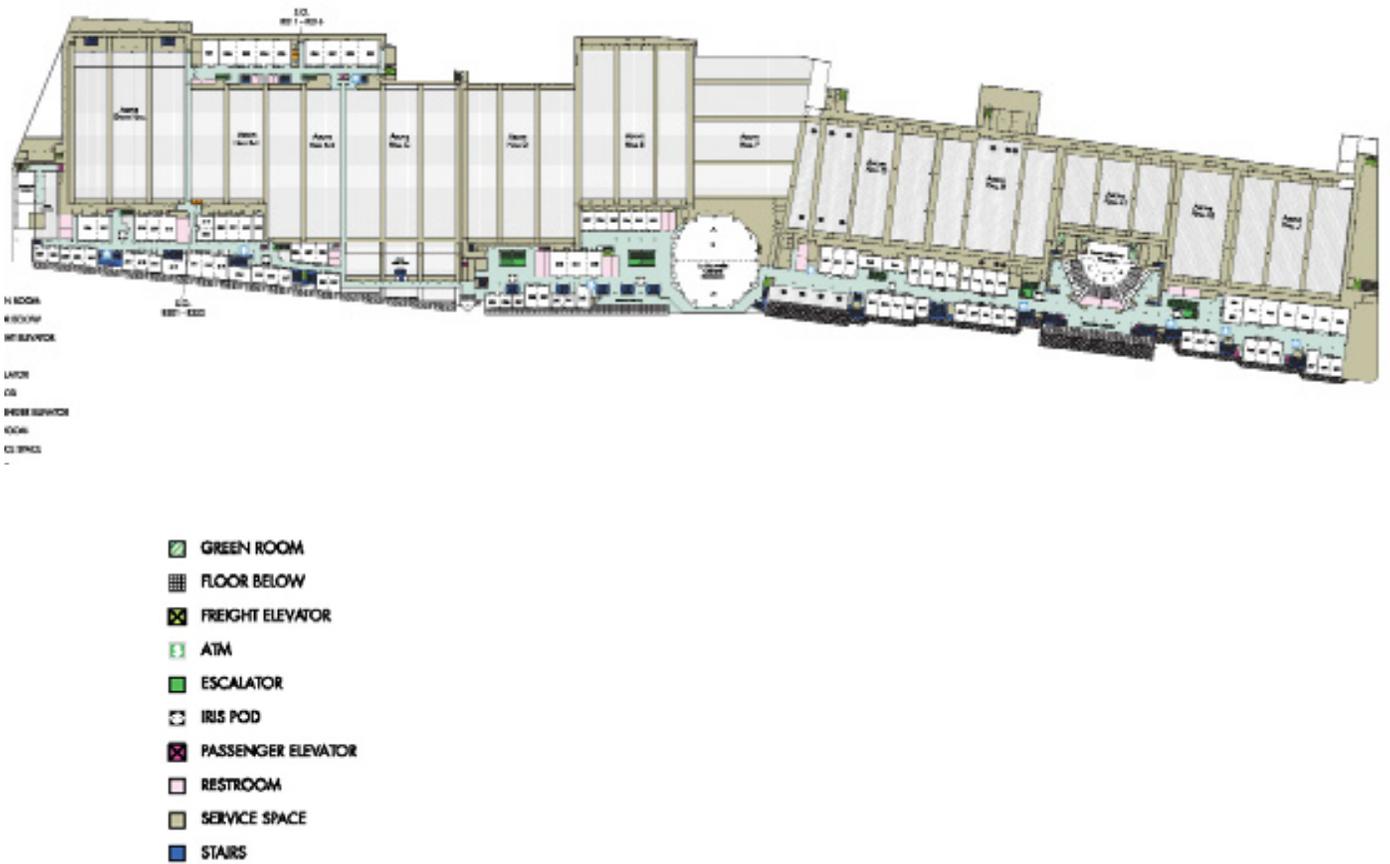INTERNATIONAL MECHANICAL ENGINEERING
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Hilton Hotel



THIRD FLOOR
ABOVE HALLS D-F



THIRD FLOOR
ABOVE HALLS I-J

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# Special
# Events

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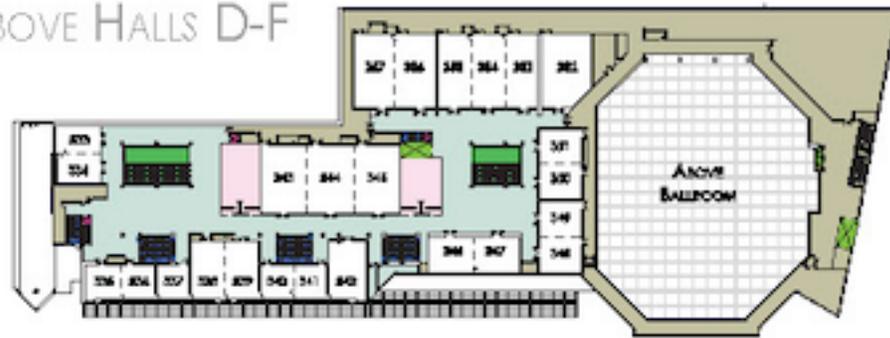
# SPECIAL EVENTS

## 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.

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# SPECIAL EVENTS

**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**

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## SPECIAL EVENTS

**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.

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# 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**

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## SPECIAL EVENTS

**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.

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# 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

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## 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**

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## 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

## SPECIAL EVENTS

**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.

**Dr. Yuan Feng**
Moderator

**Michael Sacks**
Panelist

**Yu-Ping Wang**
Panelist

**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.

**Dr. Andrea Strzelec**
Moderator

**Dr. Kelly Senecal**
Panelist

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# SPECIAL EVENTS

**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 $CO_2$ that is entering the atmosphere.

**Dr. Andrea Strzelec**
Moderator

**Matt Leuck**
Panelist

**Tim Shipp**
Panelist

**Robert Shanz**
Panelist

**Dr. Bob McCormick**
Panelist

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**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)

| | |
|---|---|
| **Poster Setup** | 9:00AM–10:00AM |
| **Judging** | 10:00AM–2:15PM |
| **General Viewing:** | 12:00PM–2:15PM |
| **Awards** | 2:15PM–2:30PM |

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## SPECIAL EVENTS

### Research Podium (Posters Only)

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

**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**

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## 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
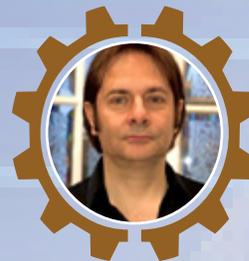
Lihua Jin

**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

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## SPECIAL EVENTS

## 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
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

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# SPECIAL EVENTS

**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**

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## 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, STIIMA-CNR

**Risk and Safety for HRC Panel**
Panelists:
Jeremy Marvel, NIST
Irene Fassi, STIIMA-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

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## 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 bachelors 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.

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# Track Plenary Sessions

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# 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

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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 deigns. 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

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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**
*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.

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# TRACK PLENARY SESSIONS

## 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.

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## Track 3: Advanced Manufacturing

**Wednesday, November 1, 2023,**
**9:45AM – 10:30AM**
**Room: 262**
**New Orleans Ernest N. Morial Convention Center**

**Implementation of the National Strategy for Advanced Manufacturing**

**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.

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## Track 4: Advanced Materials: Design, Processing, Characterization, and Applications

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

### Bioinspired Material Mechanics: Digital Discovery, Design, and Manufacturing



**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).

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### 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

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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

### . Track 5: Advances in Aerospace Technology

**Tuesday, October 31, 9:15AM–10:00AM**
**Room 261**
**New Orleans Ernest N. Morial Convention Center**

**Aerostructural Reinforced Bonded Joints: Experimental Results and Computational Modeling**

**Anthony Wass**
*University of Michigan*

**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

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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.

### Track 6: Biomedical & Biotechnology Engineering

**Wednesday, November 1,
9:45AM – 10:30AM
Room 271
New Orleans Ernest N. Morial Convention Center**

**Insulin/Adenosine Axis Involvement in Endothelial Dysfunction in Gestational Diabetes**

**Dr. Luis Sobrevia**
*Pontifficia Universidad Catolica de Chile*

**Abstract:** Gestational diabetes mellitus (GDM) causes endothelial dysfunction at the macrocirculation in the human placenta. Since the blood level of adenosine in the umbilical vein, but not in arteries, is higher in GDM compared with normal pregnancies, a role for this endogenous nucleoside in the GDM-associated endothelial dysfunction is proposed. Adenosine uptake is mediated via the human equilibrative nucleoside transporters 1 and 2 in human umbilical vein endothelial cells (HUVECs). The expression (SLC29A1 gene) and activity hENT1 is differentially modulated by insulin acting via subtype A (IR-A) and B (IR-B) receptors in HUVEC. A metabolic phenotype (p42/44mapk/Akt activity ratio <1) is characteristic of endothelial cells from GDM, an effect that is reversed to a mitogenic phenotype (p42/44mapk/Akt activity ratio >1) by insulin via IR-A in HUVEC. Recent findings show that extracellular adenosine modulates insulin action on L-arginine transport and nitric oxide synthesis in HUVEC via A1 adenosine receptors (A1AR) in GDM, but via A2AAR in normal pregnancies.

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**Bio:** Luis Sobrevia, Chilean, holds a B.Sc. in Biology and Natural Sciences from the Universidad del Bío-Bío, 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 $O_2$ 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 $O_2$ 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).

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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 $O_2$ 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

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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 $SiO_2$ domains within the particle.

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**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.

### Track 9: Engineering Education

**Tuesday, October 31, 9:15AM–10:00AM**
**Room 263**
**New Orleans Ernest N. Morial Convention Center**

**Experience in Thermal-Flow Science and Clean Energy/Power Engineering Research and Education**



**Dr. Ting Wang**
*Energy Conversion and Conservation Center*

**Abstract:** As a traditional branch of Mechanical Engineering's curriculum, the fundamental knowledge taught in thermal-flow science has furthered the major capabilities of a mechanical engineering student. The fundamental knowledge and training in thermal-flow science has been traditionally broadly applied to more practical problems encountered in clean energy/power engineering.

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 Matthey 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 PLENARY SESSIONS

## 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,

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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.

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## TRACK PLENARY SESSIONS

**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 PLENARY SESSIONS

**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 PLENARY SESSIONS

**Bio:** Tayfun Tezduyar is the James F. Barbour Professor of Mechanical Engineering at Rice University and is Professor in Faculty of Science and Engineering at Waseda University. He received his Ph.D. from Caltech in 1982. His areas of research expertise include computational fluid-structure interaction (FSI) and computational flow analysis, including spacecraft parachute FSI and aerodynamics of vehicles and tires. He pioneered stabilized finite element methods for compressible flows, space-time finite element methods for FSI and fluid-particle interaction, and parachute FSI analysis methods for the nation's new-generation spacecraft program. Tezduyar holds a 1986 Presidential Young Investigator Award. He received the computational mechanics award of the Japan Society of Mechanical Engineers, U.S. Assoc. for Comput. Mech., International Assoc. for Comput. Mech., Argentine Assoc. for Comput. Mech., Japan Assoc. for Comput. Mech., and the Asian Pacific Assoc. for Comput. Mech., and the Ted Belytschko Applied Mechanics Award of the American Society of Mechanical Engineers. He was also elected an Honorary Member of the Japan Assoc. for Comput. Mech. Tezduyar coauthored the textbook, *Computational Fluid-Structure Interaction: Methods and Applications* (Wiley), with Japanese translation (Morikita).

## 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

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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.

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**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:** 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 to 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.

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**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.

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**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).

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# Program-at-a-Glance

## PROGRAM-AT-A-GLANCE

| | | | | | | |
|---|---|---|---|---|---|---|
| **Monday, October 30** | | | | | | |
| Room | PG | 10:45am–12:30pm | PG | 2:00pm–3:45pm | PG | 4:00pm–5:45pm |
| 261 | 86 | 03-01-01: 7th Annual Conference-Wide Symposium on Additive Manufacturing (Technical Session) | 87 | 03-06-01: Advanced Material Forming – Mechanism, Characterization, Novel Processes, and Control (Technical Session) | 89 | 03-01-02: 7th Annual Conference-Wide Symposium on Additive Manufacturing: Quality Control (Technical Session) |
| 262 | 87 | 03-04-01: Advanced Machining and Finishing Processes (Technical Session) | 88 | 03-04-03: Advanced Machining and Finishing Processes (Technical Session) | 90 | 03-04-02: Advanced Machining and Finishing Processes (Technical Session) |
| 263 | 143 | 05-01-01: General Aerospace (Technical Session) | 145 | 05-04-01: Advances in Aerospace Structures and Materials (Technical Session) | 146 | 05-05-01: Beam, Plate, and Shell Structures (Technical Session) |
| 264 | 176 | 07-01-01: General Dynamics, Vibration, and Control (Technical Session) | 179 | 07-01-02: General Dynamics, Vibration, and Control (Technical Session) | 182 | 07-01-03: General Dynamics, Vibration, and Control (Technical Session) |
| 265 | 177 | 07-02-01: Nonlinear Dynamics, Control, and Stochastic Mechanics (Technical Session) | 180 | 07-02-02: Nonlinear Dynamics, Control, and Stochastic Mechanics (Technical Session) | 184 | 07-02-03: Nonlinear Dynamics, Control, and Stochastic Mechanics (Technical Session) |
| 266 | 178 | 07-06-01: Smart Structures and Structronic Systems: Sensing, Energy Generation and Control (Technical Session) | 181 | 07-08-01: Multibody Dynamic Systems and Applications (Technical Session) | 185 | 07-09-01: Vibrations of Continuous Systems (Technical Session) |
| 267 | 225 | 09-01-01: Curriculum Innovations, Pedagogy and Learning Methodologies - I (Technical Session) | 226 | 09-01-02: Curriculum Innovations, Pedagogy and Learning Methodologies - II (Technical Session) | 227 | 09-03-01: General Topics on Engineering Education (Technical Session) |
| 268 | 225 | 09-05-01: Applied Mechanics, Dynamic Systems, Experimental and Computational Methods, Advanced Materials and Testing (Technical Session) | 227 | 09-06-01: Fluid Mechanics, Aerospace Systems, Thermodynamics, Heat Transfer, Energy Systems, and Renewable Energy Applications (Technical Session) | 228 | 09-07-01: Engineering Education Projects, Novel Manufacturing and Robotics (Technical Session) |
| 269 | 235 | 10-02-01: CFD Applications for Optimization and Controls (Technical Session) | 238 | 10-02-02: CFD Applications for Optimization and Controls (Technical Session) | 240 | 10-02-03: CFD Applications for Optimization and Controls (Technical Session) |
| 270 | 236 | 10-04-01: Fluid Measurements and Instrumentation (Technical Session) | 238 | 10-04-02: Fluid Measurements and Instrumentation (Technical Session) | 240 | 10-06-01: Microfluidics 2023 - Fluid Engineering in Micro- and Nanosystems (Technical Session) |
| 271 | 237 | 10-07-01: Fluid Mechanics and Rheology of Nonlinear Materials and Complex Fluids (Technical Session) | 254 | 11-07-01: Industrial and Applied Combustion Systems (Technical Session) | 256 | 11-07-02: Industrial and Applied Combustion Systems (Technical Session) |
| 272 | 252 | 11-43-01: Heat Transfer in Battery Management and Energy Storage Technology (Technical Session) | 254 | 11-26-01: Heat and Mass Transfer in the Natural and Built Environments (Technical Session) | 257 | 11-42-01: Heat and Mass Transfer in Heating, Cooling, and Power Systems (Technical Session) |
| 273 | 253 | 11-45-01: Technique development for thermophysical characterization (Technical Session) | 255 | 11-46-01: Thermophysical properties: from macro down to micro and nanoscale (Technical Session) | 257 | 11-54-01: Fundamentals of phonons, electrons and the transport properties (Technical Session) |
| 274 | 277 | 12-03-01: Data-Enabled Predictive Modeling, Scientific Machine Learning, and Uncertainty Quantification in Computational Mechanics (Technical Session) | 278 | 12-03-02: Data-Enabled Predictive Modeling, Scientific Machine Learning, and Uncertainty Quantification in Computational Mechanics (Technical Session) | 279 | 12-03-03: Data-Enabled Predictive Modeling, Scientific Machine Learning, and Uncertainty Quantification in Computational Mechanics (Technical Session) |

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## PROGRAM-AT-A-GLANCE

| | | **Monday, October 30** | | | | | |
|---|---|---|---|---|---|---|---|
| 275 | 277 | 12-09-01: Drucker Medal Symposium (Technical Session) | 278 | 12-10-01: General: Mechanics of Solids, Structures and Fluids (Technical Session) | 280 | 12-10-02: General: Mechanics of Solids, Structures and Fluids (Technical Session) | |
| 276 | 298 | 13-13-01: Simulations of Material Modeling and Behavior Analysis for MEMS Applications (Technical Session) | 299 | 13-06-01: Applied Mechanics and Materials in Micro- and Nano-Systems I (Technical Session) | 301 | 13-06-02: Applied Mechanics and Materials in Micro- and Nano-Systems II (Technical Session) | |
| 277 | 299 | 13-07-01: Packaging Technology in Heterogeneous Integration Applications & 13-12-01: MEMS based Electrochemical Sensors in Biomedical Applications (Technical Session) | 300 | 13-08-01: Energy Harvesting and Storage & 13-09-01: Advanced Manufacturing of Microsystems, Microstructures, and Miniaturized Actuators (Technical Session) | 301 | 13-10-01: Microfluidics 2023 (Technical Session) | |
| 278 | 307 | 14-01-02: General Topics on Risk, Safety, and Reliability (Technical Session) | 308 | 14-01-01: Reliability and Safety in Transportation Systems (Technical Session) | 308 | 14-02-01: Models and Methods for Probabalistic Risk Analysis (Technical Session) | |
| 279 | 307 | 14-08-01: Users, Technology, and Human Reliability in Safety Engineering (Technical Session) | 239 | 10-03-01: DNS, LES and Hybrid-RANS/LES Methods for CFD (Technical Session) | | | |
| 280 | 200 | 08-01-01: Environmental Impact of Energy Systems (Technical Session) | 201 | 08-04-01: Sustainable Energy Systems for Heating and Cooling (Technical Session) | 203 | 08-04-02: Sustainable Energy Systems for Heating and Cooling (Technical Session) | |
| 288 | 200 | 08-02-01: Energy Systems Components (Technical Session) | 202 | 08-09-01: Electrochemical Energy Storage and Conversion Systems (Technical Session) | 204 | 08-09-02: Electrochemical Energy Storage and Conversion Systems (Technical Session) | |
| 289 | 115 | 04-07-01: Process Development, Characterization, and Optimization for Additive, Subtractive, and Hybrid Manufacturing (Technical Session) | 117 | 04-02-01: Material Processing of Flexible/Emerging Electronics, Sensors, and Devices (Technical Session) | 118 | 04-02-02: Material Processing of Flexible/Emerging Electronics, Sensors, and Devices (Technical Session) | |
| 290 | 178 | 07-03-01: Design and Control of Robots, Mechanisms and Structures I (Technical Session) | 182 | 07-03-02: Design and Control of Robots, Mechanisms and Structures II (Technical Session) | 185 | 07-03-03: Design and Control of Robots, Mechanisms and Structures III (Technical Session) | |
| 291 | 116 | 04-08-01: Design of engineered materials and components for additive manufacturing (Technical Session) | | | | 03-16-01: Manufacturing: General (Technical Session) | |
| 292 | 144 | 05-11-01: Advances in Mechanics, Multiscale Models and Experimental Techniques for Composites (Technical Session) | 145 | 05-12-01: Peridynamics Modeling (Technical Session) | 147 | 05-12-02: Peridynamics Modeling (Technical Session) | |
| | | **Tuesday, October 31** | | | | | |
| Room | PG | 10:15am–12:00pm | | 2:00pm–3:45pm | | 4:00pm–5:45pm | |
| 261 | 92 | 03-01-03: 7th Annual Conference-Wide Symposium on Additive Manufacturing: Ceramics and Cementitious Materials (Technical Session) | 93 | 03-01-06: 7th Annual Conference-Wide Symposium on Additive Manufacturing: Advances (Technical Session) | 95 | 03-01-05: 7th Annual Conference-Wide Symposium on Additive Manufacturing: Processing (Technical Session) | |
| 262 | 91 | 03-08-01: Computational Modeling and Simulation for Advanced Manufacturing (Technical Session) | 94 | 03-08-02: Computational Modeling and Simulation for Advanced Manufacturing (Technical Session) | 96 | 03-06-02: Advanced Material Forming – Mechanism, Characterization, Novel Processes, and Control (Technical Session) | |
| 263 | 119 | 04-01-01: Mechanics of Design, Processing, and Performance of Heterogeneous Composites (Technical Session) | 120 | 04-20-01: Dynamics of Advanced Functional Materials and Structures (Technical Session) | 122 | 04-03-01: Mechanical Metamaterials (Technical Session) | |
| 264 | 148 | 05-08-01: Dynamics and Control of Aerosapce Structures (Technical Session) | 150 | 05-16-01: Applications of Artificial Intelligence/Machine Learning in Aerospace Engineering (Technical Session) | 123 | 04-06-01: Nanoengineered, Nano Modified, Hierarchical, Multi-Scale Materials and Structures (Technical Session) | |

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| | | **Tuesday, October 31** | | | | |
|---|---|---|---|---|---|---|
| 265 | 148 | 05-07-01: Advanced Manufacturing and Mechanical Behavior of Composites (Technical Session) | 155 | 06-02-01: Vibration and Acoustics in Biomedical Applications (Technical Session) | 157 | 06-03-01: Biomedical Imaging, Therapy and Tissue Characterization (Technical Session) |
| 266 | 154 | 06-01-01: Injury and Damage Biomechanics - Traumatic Brain Injury and Head Impact Studies (Technical Session) | 156 | 06-01-02: Injury and Damage Biomechanics - Experimental and Computational Approaches in Brain Injury Research (Technical Session) | 158 | 06-01-03: Injury and Damage Biomechanics - Biomechanics and Modeling of Neural and Musculoskeletal Systems (Technical Session) |
| 267 | 186 | 07-01-04: General Dynamics, Vibration, and Control (Technical Session) | 189 | 07-01-05: General Dynamics, Vibration, and Control (Technical Session) | 192 | 07-12-01: Optimization, Uncertainty and Probability (Technical Session) |
| 268 | 187 | 07-11-01: Control Theory and Applications (Technical Session) | 190 | 07-04-01: Fluid-Structure Interaction (Technical Session) | 192 | 07-16-01: Multi-Field Coupling and Control (Technical Session) |
| 269 | 188 | 07-10-01: Mobile Robots and Unmanned Ground Vehicles (Technical Session) | 191 | 07-10-02: Mobile Robots and Unmanned Ground Vehicles (Technical Session) | 193 | 07-10-03: Mobile Robots and Unmanned Ground Vehicles (Technical Session) |
| 270 | 205 | 08-09-03: Electrochemical Energy Storage and Conversion Systems (Technical Session) | 207 | 08-09-04: Electrochemical Energy Storage and Conversion Systems (Technical Session) | 208 | 08-13-01: Multi-Energy Systems (Technical Session) |
| 271 | 206 | 08-11-01: Electric vehicle batteries as multifunctional energy storages (Technical Session) | 208 | 08-11-02: Electric vehicle batteries as multifunctional energy storages (Technical Session) | 209 | 08-16-01: Solar Thermal (Technical Session) |
| 272 | 229 | 09-01-03: Curriculum Innovations, Pedagogy and Learning Methodologies - III (Technical Session) | 230 | 09-01-04: Curriculum Innovations, Pedagogy and Learning Methodologies - IV (Technical Session) | 232 | 09-11-01: K-12 Outreach and Engineering Innovation (Technical Session) |
| 273 | 229 | 09-08-01: Distance/Online Engineering Education, Models and Enabling Technologies (Technical Session) | 230 | 09-10-01: Teaching Laboratories, Hands-on Experiences, Embedding Novel Manufacturing Concepts in ME Programs, and Technology-Aided Lecturing (Technical Session) | 232 | 09-12-01: Mechatronics, Automation, Robotics, and Control Engineering (Technical Session) |
| 274 | 241 | 10-05-01: 29th Symposium on Fundamental Issues and Perspectives in Fluid Mechanics - I (Technical Session) | 243 | 10-05-02: 29th Symposium on Fundamental Issues and Perspectives in Fluid Mechanics - II (Technical Session) | 244 | 10-05-03: 29th Symposium on Fundamental Issues and Perspectives in Fluid Mechanics - III (Technical Session) |
| 275 | 242 | 10-08-01: Electric, Magnetic and Thermal Phenomena in Micro and Nano-Scale Systems (Technical Session) | 243 | 10-13-01: Graduate Student Scholar (GSS) Competition (Technical Session) | 151 | 05-16-02: Applications of Artificial Intelligence/Machine Learning in Aerospace Engineering (Technical Session) |
| 276 | 258 | 11-32-01: Heat Transfer in Hypersonic Flows (Technical Session) | 260 | 11-16-02: Oscillating Heat Pipes and Thermosiphons (Technical Session) | 262 | 11-20-01: Gas Turbine and Enhanced Heat Transfer (Technical Session) |
| 277 | 259 | 11-47-01: Phase Change Heat Transfer (Technical Session) | 261 | 11-57-01: Fundamentals of Boiling/Condensation including Micro/Nano-scale effects (Technical Session) | 263 | 11-02-01: Multi-Scale Multi-Phase Heat Transfer Equipment (Technical Session) |
| 278 | 281 | 12-10-03: General: Mechanics of Solids, Structures and Fluids (Technical Session) | 282 | 12-10-04: General: Mechanics of Solids, Structures and Fluids (Technical Session) | 284 | 12-20-01: Functional Origami and Kirigami-inspired Structures and Metamaterials (Technical Session) |
| 279 | 282 | 12-18-01: Mechanics of Soft Materials (Technical Session) | 283 | 12-18-02: Mechanics of Soft Materials (Technical Session) | 284 | 12-18-03: Mechanics of Soft Materials (Technical Session) |

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## PROGRAM-AT-A-GLANCE

| | | Tuesday, October 31 | | | | |
|---|---|---|---|---|---|---|
| 280 | 302 | 13-04-01: Applications of Micro and Nano Systems in Medicine and Biology I (Technical Session) | 303 | 13-04-02: Applications of Micro and Nano Systems in Medicine and Biology II (Technical Session) | 305 | 13-02-01: Design and Fabrication, Analysis, Processes, and Technology for Micro and Nano Devices and Systems (Technical Session) |
| 288 | 303 | 13-05-01: Micro and Nano Devices (Technical Session) | 304 | 13-03-01: Computational Studies on MEMS and Nanostructures (Technical Session) | 124 | 04-01-02: Mechanics of Design, Processing, and Performance of Heterogeneous Composites (Technical Session) |
| 289 | 309 | 14-02-02: Reliability and Risk in Energy Systems (Technical Session) | 310 | 14-04-01: Machine Learning for Safety, Reliability, and Maintenance (Technical Session) | 310 | 14-06-01: Developments in Design Theory for Component and System Safety and Reliability (Technical Session) |
| 290 | 189 | 07-03-04: Design and Control of Robots, Mechanisms and Structures IV (Technical Session) | 150 | 05-06-01: Lightweight Sandwich Composites and Layered Structures (Technical Session) | 152 | 05-10-01: Composite Structures: Response and Failure (Technical Session) |
| 291 | 120 | 04-05-01: Materials Processing and Characterization (Technical Session) | 121 | 04-05-02: Materials Processing and Characterization (Technical Session) | 125 | 04-05-03: Materials Processing and Characterization (Technical Session) |
| | | Wednesday, November 1 | | | | |
| Room | PG | 10:45am–12:30pm | | 2:00pm–3:45pm | | 4:00pm–5:45pm |
| 261 | 67 | 01-08-01: Flow-Induced Noise and Vibration (Technical Session) | | | | |
| 262 | 68 | 01-02-01: Passive, Semi-Active, and Active Noise and Vibration Control (Technical Session) | 70 | 01-06-01 Dynamics of Adaptive Engineering Structures and Material (Technical Session) | 72 | 01-16-01: Congress-Wide Symposium on NDE & SHM: Ultrasonic Waves for Material Characterization and Damage Assessment (Technical Session) |
| 263 | 69 | 01-04-01: Phononics: Nonlinearity and Energy Harvesting (Technical Session) | 70 | 01-04-02: Phononics - Fundamental Studies (Technical Session) | 79 | 02-04-01: Data Driven Design (Technical Session) |
| 264 | 78 | 02-01-01: Product and Process Design (Technical Session) | 78 | 02-02-01: Design, Modeling and Systems (Technical Session) | 80 | 02-03-01: Optimization (Technical Session) |
| 265 | 97 | 03-05-01: 8th Symposium on Fastening and Joining Research and Advanced Technology (Technical Session) | 100 | 03-01-04: 7th Annual Conference-Wide Symposium on Additive Manufacturing: Applications (Technical Session) | 103 | 03-02-01: Congress-Wide Symposium on NDE & SHM: Measurement Science, Sensors, and Process Monitoring and Control for Advanced Manufacturing (Technical Session) |
| 266 | 98 | 03-07-01: Innovative Product Design and Manufacturing (Technical Session) | 101 | 03-03-01: Nanomanufacturing: Novel Processes, Applications, and Process-Property Relationships (Technical Session) | 104 | 03-09-01: Variation Simulation and Design for Assembly (Technical Session) |
| 267 | 126 | 04-05-04: Materials Processing and Characterization (Technical Session) | 128 | 04-05-05: Materials Processing and Characterization (Technical Session) | 130 | 04-05-06: Materials Processing and Characterization (Technical Session) |
| 268 | 127 | 04-29-01: Additive Manufacturing and 3D Printing (Technical Session) | 128 | 04-29-02: Frontal Polymerization and 3D Printing (Technical Session) | 130 | 04-29-03: Frontal Polymerization and Machine Learning (Technical Session) |

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| | | Wednesday, November 1 | | | | |
|---|---|---|---|---|---|---|
| 269 | 126 | 04-09-01: Design of Engineering Materials (Technical Session) | 129 | 04-14-01: Active Materials for Bioinspired and Biomimetic Applications (Technical Session) | 131 | 04-17-01: Manufacturing, Integration and Characterization of Multifunctional Structure and Devices (Technical Session) |
| 270 | 159 | 06-01-04: Injury and Damage Biomechanics - Medical Applications and Tissue Damage Studies (Technical Session) | 161 | 06-03-02: Biomedical Imaging, Therapy and Tissue Characterization (Technical Session) | 132 | 04-18-01: Bioinspired Materials, Structures and Applications (Technical Session) |
| 271 | 159 | 06-04-01: Biomaterials and Tissue: Modelling, Synthesis, Fabrication and Characterization (Technical Session) | 162 | 06-04-02: Biomaterials and Tissue: Modelling, Synthesis, Fabrication and Characterization (Technical Session) | 163 | 06-05-01: Biomedical Devices (Technical Session) |
| 272 | 194 | 07-17-01: Machine Learning and Artificial Intelligence in Dynamics, Vibrations and Control (Technical Session) | 195 | 07-17-02: Machine Learning and Artificial Intelligence in Dynamics, Vibrations and Control (Technical Session) | 197 | 07-17-03: Machine Learning and Artificial Intelligence in Dynamics, Vibrations and Control (Technical Session) |
| 273 | 195 | 07-18-01: Marine Electromechanical Systems and Ocean Mechatronics (Technical Session) | 196 | 07-20-01: Congress-Wide Symposium on NDE &SHM: Dynamics, Vibration, and Control for Structural Health Monitoring Applications (Technical Session) | | |
| 274 | 210 | 08-10-01: Advance Materials for Electrochemical Energy (Technical Session) | 213 | 08-05-01: Energy-Related Multidisciplinary I (Technical Session) | 216 | 08-08-01: Design Analysis and Optimization of Energy Conversion Systems - 1 (Technical Session) |
| 275 | 210 | 08-05-02: Energy-Related Multidisciplinary II (Technical Session) | 214 | 08-05-03: Energy-Related Multidisciplinary III (Technical Session) | 217 | 08-05-04: Energy-Related Multidisciplinary IV (Technical Session) |
| 276 | 245 | 10-09-01: Multiphase Flows and Applications (Technical Session) | 246 | 10-09-02: Multiphase Flows and Applications (Technical Session) | 247 | 10-09-03: Multiphase Flows and Applications (Technical Session) |
| 277 | 245 | 10-10-01: Industrial Flows (Technical Session) | 247 | 10-10-02: Industrial Flows (Technical Session) | 248 | 10-10-03: Industrial Flows (Technical Session) |
| 278 | 264 | 11-62-01: Machine Learning for Thermal Transport (Technical Session) | 264 | 11-01-01: Single-phase Enhanced Heat Transfer Equipment (Technical Session) | 266 | 11-01-02: Single-phase Enhanced Heat Transfer Equipment (Technical Session) |
| 279 | | 11-66-01: Panel on contemporary issues related to micro/nano thermal transport (Technical Session) | 265 | 11-58-01: Nanoscale Thermal Transport (Technical Session) | 267 | 11-65-01: Near-field Radiative Heat Transfer and Energy Conversion (Technical Session) |
| 280 | | | | 12-08-01: Committee on Computing in Applied Mechanics (CONCAM) Distinguished Lectures on Computational Mechanics (Technical Session) | 287 | 12-12-01: Novel Verification, Validation, and Uncertainty Quantification (VVUQ) Techniques and Approaches for Energy, Biomedical, and Advanced Manufacturing Applications (Technical Session) |
| 288 | 285 | 12-15-01: Mechanics and Design of Cellular Materials (Technical Session) | 286 | 12-16-01: Multiscale Models and Experimental Techniques for Composite Materials and Structures Count (Technical Session) | | 12-08-02: Committee on Computing in Applied Mechanics (CONCAM) Distinguished Lectures on Computational Mechanics (Technical Session) |
| 289 | 211 | 08-14-01: Thermal, thermo-mechanical and thermo-chemical Energy Storage systems (Technical Session) | 214 | 08-14-02: Thermal, thermo-mechanical and thermo-chemical Energy Storage systems (Technical Session) | 268 | 11-30-01: Computational Heat Transfer - Applications (Technical Session) |

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## PROGRAM-AT-A-GLANCE

| | | Wednesday, November 1 | | | | |
|---|---|---|---|---|---|---|
| 290 | 212 | 08-19-01: Innovations for Cleaner Energy Conversion Technologies (Technical Session) | 215 | 08-19-02: Innovations for Cleaner Energy Conversion Technologies (Technical Session) | 218 | 08-19-03: Innovations for Cleaner Energy Conversion Technologies (Technical Session) |
| 291 | 99 | 03-12-01: Digital Manufacturing Process Simulation and Validation (Technical Session) | 102 | 03-12-02: Digital Manufacturing Process Simulation and Validation (Technical Session) | 164 | 06-09-04: Computational Modeling in Biomedical Applications - IV (Technical Session) |
| 292 | 160 | 06-12-01: Robotics, Rehabilitation (Technical Session) | 162 | 06-12-02: Robotics, Rehabilitation (Technical Session) | 165 | 06-12-03: Robotics, Rehabilitation (Technical Session) |
| 298 | | | 69 | 01-13-01 Acoustics and Vibrations: AI, ML and Acoustic Sensors and Devices (Technical Session) | 71 | 01-12-01 Vibration and Acoustic Measurements, Signal Processing, and Test Facilities (Technical Session) |

| | | Thursday, November 2 | | | | |
|---|---|---|---|---|---|---|
| Room | PG | 10:15am–12:00pm | | 2:00pm–3:45pm | | 4:00pm–5:45pm |
| 261 | 73 | 01-04-03: Phononic: Topological Phononics (Technical Session) | 74 | 01-17-01: Congress-Wide Symposium on NDE & SHM: Computational Nondestructive Evaluation and Structural Health Monitoring (Technical Session) | 76 | 01-17-02 Congress-Wide Symposium on NDE & SHM: Computational nondestructive evaluation and structural health monitoring (Technical Session) |
| 262 | 73 | 01-01-01 New Advances in Acoustics and Vibrations (Technical Session) | 75 | 01-16-02: Congress-Wide Symposium on NDE & SHM: Ultrasonic Waves for Material Characterization and Damage Assessment (Technical Session) | | |
| 263 | 81 | 02-01-02: Product and Process Design (Technical Session) | 82 | 02-01-03: Product and Process Design (Technical Session) | | |
| 264 | 81 | 02-05-01: Design for Additive Manufacturing (Technical Session) | 83 | 02-06-01: Product and Sustainable Design (Technical Session) | 109 | 03-02-02: Congress-Wide Symposium on NDE & SHM: Measurement Science, Non-destructive Evaluation (NDE) and Process Monitoring for Advanced Manufacturing (Technical Session) |
| 265 | 106 | 03-11-01: Laser-Based Advanced Manufacturing and Materials Processing (Technical Session) | 108 | 03-11-02: Laser-Based Advanced Manufacturing and Materials Processing (Technical Session) | 110 | 03-11-03: Laser-Based Advanced Manufacturing and Materials Processing (Technical Session) |
| 266 | 105 | 03-10-01: Robotics and Automation in Advanced Manufacturing (Technical Session) | 108 | 03-13-01: Conference-Wide Symposium on Biomedical Manufacturing & Materials (Technical Session) | 139 | 04-23-01 (Technical Session) |
| 267 | 133 | 04-05-07: Materials Processing and Characterization (Technical Session) | 135 | 04-05-08: Materials Processing and Characterization (Technical Session) | 139 | 04-19-01: Modeling, Simulation, and Design of Multifunctional Materials (Technical Session) |
| 268 | 133 | 04-29-04: Composite Manufacturing and Properties (Technical Session) | 136 | 04-28-01: Modeling and Experiments in Nanomechanics and Nanomaterials (Technical Session) | 140 | 04-28-02: Modeling and Experiments in Nanomechanics and Nanomaterials (Technical Session) |
| 269 | 134 | 04-17-02: Manufacturing, Integration and Characterization of Multifunctional Structure and Devices (Technical Session) | 136 | 04-26-01: Integrated Computational Materials Engineering (ICME) Mini-symposium (Technical Session) | 141 | 04-26-02 (Technical Session) |

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# PROGRAM-AT-A-GLANCE

| | | Thursday, November 2 | | | | |
|---|---|---|---|---|---|---|
| 270 | 166 | 06-05-02: Biomedical Devices (Technical Session) | 169 | 06-05-03: Biomedical Devices (Technical Session) | 172 | 06-05-04: Biomedical Devices (Technical Session) |
| 271 | 166 | 06-06-01: Dynamics and Control of Biomechanical Systems (Technical Session) | 170 | 06-08-01: Biotransport (Fluid, Heat, and Mass). (Technical Session) | 172 | 06-11-01: Sensors and Actuators (Technical Session) |
| 272 | 167 | 06-09-01: Computational Modeling in Biomedical Applications - I (Technical Session) | 171 | 06-09-02: Computational Modeling in Biomedical Applications -II (Technical Session) | 173 | 06-09-03: Computational Modeling in Biomedical Applications -III (Technical Session) |
| 273 | 219 | 08-18-01: Sustainable Buildings and Communities (Technical Session) | 221 | 08-18-02: Indoor Environmental Quality and Building Materials for Energy Sustainability (Technical Session) | 223 | 08-08-04: Design Analysis and Optimization of Energy Conversion Systems - 4 (Technical Session) |
| 274 | 219 | 08-17-01: Alternative Energy Conversion Tech (incl Wind, Geothermal, Hydro, Ocean) (Technical Session) | 221 | 08-21-01: Nuclear Energy Forum: Plants, Design, Analysis and Safety (Technical Session) | 293 | 12-07-02: Mechanical Metamaterials (Technical Session) |
| 275 | | | 222 | 08-08-03: Design Analysis and Optimization of Energy Conversion Systems - 3 (Technical Session) | | |
| 276 | 220 | 08-08-02: Design Analysis and Optimization of Energy Conversion Systems - 2 (Technical Session) | 272 | 11-22-01 Transport Phenomena in Additive Manufacturing (Technical Session) | 274 | 11-25-01: Heat Transfer in Electronic Equipment (Technical Session) |
| 277 | 269 | 11-16-01: Boiling and Condensation (Technical Session) | 271 | 11-19-01: Solid/liquid phase change processes with applications (Technical Session) | | 11-69-01: Panel Session on the use of Verification, Validation, and Uncertainty Quantification (VVUQ) Engineering Standards in Academia, Gov't Laboratories, and Industry |
| 278 | 269 | 11-59-01: First Principles and Molecular Dynamics Simulations of Thermal Transport in Solids (Technical Session) | 271 | 11-60-01: Simulations of Thermal Transport in Nanostructures and across Interfaces (Technical Session) | 140 | 04-18-02: Bioinspired Materials, Structures and Applications (Technical Session) |
| 279 | 270 | 11-67-01: Novel Verification, Validation, and Uncertainty Quantification (VVUQ) Techniques and Approaches for Fluids Applications, Heat Transfer, and Thermal Engineering (Technical Session) | 295 | 12-21-01: Instabilities in Solids and Structures (Technical Session) | 295 | 12-21-02: Instabilities in Solids and Structures (Technical Session) |
| 280 | | 12-11-01: Fatigue and fracture evaluation and quantification for failure analysis (Technical Session) | | 12-02-02: Modeling of the Fracture, Failure, and Fatigue in Solids (Technical Session) | 295 | 12-02-03: Modeling of the Fracture, Failure, and Fatigue in Solids (Technical Session) |
| 288 | 295 | 12-02-01: Modeling of the Fracture, Failure, and Fatigue in Solids (Technical Session) | 273 | 11-68-01: Engineering Standards, Guidance, and Approaches for Verification, Validation, and Uncertainty Quantification (VVUQ) (Technical Session) | 286 | 12-14-01: Fracture and Failure of Reinforced Polymer Matrix Composite Materials (Technical Session) |
| 289 | 107 | 03-16-02: Manufacturing: General (Technical Session) | 291 | 12-07-01: Mechanical Metamaterials (Technical Session) | 110 | 03-16-03: Manufacturing: General (Technical Session) |
| 290 | 135 | 04-21-01: Printed Hybrid Multifunctional Electronics and Energy Devices (Technical Session) | 137 | 04-21-02 (Technical Session) | 142 | 04-27-02: Mechanics of Penetration, Shockwaves, and High-Strain-Rate Events: Modeling and Experiments (Technical Session) |
| 291 | 168 | 06-14-01: Biotechnology and General Applications (Technical Session) | 138 | 04-27-01: Mechanics of Penetration, Shockwaves, and High-Strain-Rate Events: Modeling and Experiments (Technical Session) | | 12-06-01: Multi-scale Computations in Fluids, Structures, and Materials (Technical Session) |

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# Tecnical Sessions

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## TECHNICAL SESSIONS

**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*

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## TECHNICAL SESSIONS

*Xuan "Peter" Zhu, The University of Utah*
*Yongfeng Xu, University of Cincinnati*
*Yousof Azizi, Bridgestone Americas*
*Zhenhua Tian, Virginia Polytechnic Institute and State University*

### 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*

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## 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*

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## TECHNICAL SESSIONS

**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 Student Section*

**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 Vakhlamov - 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*

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## TECHNICAL SESSIONS

**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 Nation Laboratory*

**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*

**01-06-01 Dynamics of Adaptive Engineering Structures and Material**
**11/1/2023**
**2:00PM–3:45PM – Room 262**

**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*

**2:21PM**

**Localized to Bulk Mode Transition by Boundary Deformation in Nonlinear Elastic Lattices**

Technical Presentation: IMECE2023-113914

*Adib Rahman - Kansas State University*

*Raj Kumar Pal - Kansas State University*

**2:42PM**

**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**

**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*

**01-04-02: Phononics - Fundamental Studies**
**11/1/2023**
**2:00PM–3:45PM – Room 263**

**2:00PM**

**Bandgap Formation Patterns in Phononic Crystals**

**Technical Presentation: IMECE2023-120341**

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

*Mostafa Nouh - University at Buffalo*

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## TECHNICAL SESSIONS

**2:21PM**

**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*

**2:42PM**

**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*

**3:03PM**

**On Designing Zero-Frequency Corner Modes in Elastically-Supported Honeycomb Lattices**

Technical Presentation: IMECE2023-112668

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

**3:24PM**

**Mechanics Guided Characterization of Elastic Metamaterial**

Technical Presentation: IMECE2023-120256

*Mamdudur Rahman - University Of South Carolina*

*Dale Hitchcock - Savana River National Laboratory*

*William Johnson - Savana 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**
**11/1/2023**
**4:00PM–5:45PM – Room 298**

**4:00PM**

**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*

**4:21PM**

**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, Baltimore County*

**4:42PM**

**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*

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**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*

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**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**

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**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*

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**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*

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## TECHNICAL SESSIONS

### 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 Manogharan - 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*

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## TECHNICAL SESSIONS

### 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*

*Keping 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*

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## TECHNICAL SESSIONS

**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*

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## TECHNICAL SESSIONS

**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*

**01-17-02 Congress-Wide Symposium on NDE & SHM: Computational Nondestructive Evaluation and Structural Health Monitoring**
**11/2/2023**
**4:00PM–5:45PM – Room 261**

**4:00PM**

**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*

**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**

**High Fidelity Modeling of Wear, Hysteresis, and Tooth Cracks in Strain Wave Gears for PHM Purposes**

Technical Paper Publication: IMECE2023-112537

*Roberto Guida - Politecnico di Torino*

*Antonio Carlo Bertolino - Politecnico di Torino*

*Andrea De Martin - Politecnico di Torino*

*Andrea Raviola - Politecnico di Torino*

*Massimo Sorli - Politecnico di Torino*

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## TECHNICAL SESSIONS

### 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*

### TOPIC 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*

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## 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*

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## TECHNICAL SESSIONS

**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.*

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## TECHNICAL SESSIONS

**4:42PM**

**Importance of Data Scaling for Various Machine Learning Models: A Case Study Based on Ionic Liquids for Processing Extra-Terrestrial Regolith**

Technical Paper Publication: IMECE2023-113955

*Fatlum Rexhepi - Washington State University*

*Soumik Banerjee - Washington State University*

**5:03PM**

**The Impact of Different Backbone Architecture on Autonomous Vehicle Dataset**

Technical Paper Publication: IMECE2023-114859

*Ning Ding - Virginia Polytechnic Institute and State University*

*Azim Eskandarian - Virginia Polytechnic Institute and State University*

**5:24PM**

**Classification of Brain Malignant Tumors Using MRI Scans and CNN Architectures With Optimized Hyperparameters**

Technical Paper Publication: IMECE2023-111454

*Miri Weiss Cohen - Braude College of Engineering*

**02-03-01: Optimization**
**11/1/2023**
**4:00PM–5:45PM – Room 264**

**4:00PM**

**Classification-Based Multi-Fidelity Adaptive Sampling for Optimization and Surrogate Modeling**

Technical Paper Publication: IMECE2023-115251

*Christopher D. Noble - University of Arizona*

*Samy Missoum - University of Arizona*

**4:21PM**

**Generative Design of Conformal Patch Antenna on Curved Surfaces Using Conformal Mapping Theory**

Technical Presentation: IMECE2023-119662

*Qian Ye - Palo Alto Research Center, part of SRI International*

*Randi Wang - Palo Alto Research Center, part of SRI International*

**4:42PM**

**Design and Development of an Adjustable Constant Force Mechanism**

Technical Paper Publication: IMECE2023-114438

*Shane Johnson - Shanghai Jiao Tong University*

*Tanzeel Ur Rehman - Shanghai Jiao Tong University*

**5:03PM**

**A Computational Study on Adaptive Multiobjective Optimization of Blowout Preventer Valve System**

Technical Paper Publication: IMECE2023-113091

*Fei Song - Schlumberger*

*Laurent Caekebeke - Schlumberger*

*Prabhu Jagadesan - Schlumberger*

*Ke Li - Schlumberger*

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## TECHNICAL SESSIONS

**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*

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## TECHNICAL SESSIONS

**10:57AM**

**Design Optimization of Additively Manufactured Components Using Simulation-Based Analysis of Infill Structures**

Technical Paper Publication: IMECE2023-113065

*Karim Asami - Insitute of Laser and System Technologies*

*Sebastian Roth - Institute of Laser and System Technologies*

*Michel Krukenberg - Technical University Hamburg*

*Claus Emmelmann - Institute of Laser and System Technologies*

**11:18AM**

**On the Prediction of Mechanical and Aesthetical Behavior of AM Specimens Through Machine Learning: A Preliminary Study**

Technical Paper Publication: IMECE2023-113360

*Alessandro Greco - University of Campania Luigi Vanvitelli*

*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*

**02-01-03: Product and Process Design**
**11/2/2023**
**2:00PM–3:45PM – Room 263**

**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*

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## TECHNICAL SESSIONS

**3:03PM**

**Data-Informed Design Process for SME: A Streamlined Validation and Prediction Approach for Customer Perception of Innovative Material Prototypes**

Technical Paper Publication: IMECE2023-112222

*Bastian Quattelbaum - HS Niederrhein*

*Christine Steinem - HS Niederrhein*

*Marc Neumann - HS Niederrhein*

**3:24PM**

**Detecting 3D Skeleton Motion Using a Deep Learning Approach**

Technical Presentation: IMECE2023-110333

*Miri Weiss Cohen - Braude College of Engineering*

**02-06-01: Product and Sustainable Design**
**11/2/2023**
**2:00PM–3:45PM – Room 264**

**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*

**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.*

**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*

**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*

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## TECHNICAL SESSIONS

### 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

3-3:   Nanomanufacturing: Novel Processes, Applications, and Process-Property Relationships

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 Taheri, 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.*

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## TECHNICAL SESSIONS

Shanshan Yao

Shinichi Warisawa

Shunyu Liu

Stephen Baek, University of Virginia

Tim Röver

Vladimir Kuts, Tallinn University of Technology

William J. 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

---

**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

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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

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## TECHNICAL SESSIONS

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

**03-01-01: 7th Annual Conference-Wide Symposium on Additive Manufacturing**
**10:45AM–12:30PM –Room 261**

**10:45AM**

**Advances in Light Processing Based Additive Manufacturing: From Digital Light Processing to Ultrafast Laser Direct Writing**

Technical Presentation: IMECE2023-113591

*SeungYeon Kang - University of Connecticut*

**11:06AM**

**Modeling and Optimization of Frontal Polymerization-Based Reactive Direct Ink Writing of Composite Tows**

Technical Presentation: IMECE2023-119653

*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*

**11:27AM**

**Extrusion Mechanisms for Printing Thermosetting Prepolymers**

Technical Paper Publication: IMECE2023-113409

*Muhammad Danish - University of New Haven*

*Ravi Mishra - University of New Haven*

*Abid Ali Junaid - University of New Haven*

*Omar Faruk Emon - University of New Haven*

**11:48AM**

**Measurement of Optimum Laser Energy Required to 3D Print Continuous Fiber Reinforced Composites Using Photo-Curable Thermoset Resin**

Technical Paper Publication: IMECE2023-113543

*Md Zahirul Islam - North Dakota State University*

*Md Atikur Rahman - North Dakota State University*

*Luke Gibbon - North Dakota State University*

*Eric Hall - North Dakota State University*

*Chad Ulven - North Dakota State University*

*John J. La Scala - Combat Capabilities Development Command Army Research Laboratory*

**12:09PM**

**Creating Stronger Interfaces in Additively Manufactured Multimaterial Polymer Composites Under Shear Loading**

Technical Paper Publication: IMECE2023-113851

*Umut Altuntaş - Middle East Technical University*

*Demirkan Coker - Middle East Technical University*

*Denizhan Yavas - Lamar University*

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## TECHNICAL SESSIONS

### 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

*Alireza Asadbeygi - 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 -Ttsinghua 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*

*Ihab Ragai - Penn State University, Erie*

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## TECHNICAL SESSIONS

**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*

**3:24PM**

**Spin Forming Simulation and Forming Defect Analysis of Thin-Walled Deep Conical Parts**

Technical Paper Publication: IMECE2023-114640

*Jiabin Zheng - Ningbo University*

*Xuedao Shu - Ningbo University*

*Qinying Lu - Ningbo University*

*Zixuan Li - Ningbo University*

*Haijie Xu - Ningbo University*

*Junkun Len - Ningbo University*

**03-04-03: Advanced Machining and Finishing Processes**
**10/30/2023**
**2:00PM–3:45PM – Room 262**

**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*

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## TECHNICAL SESSIONS

**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*

**03-01-02: 7th Annual Conference-Wide Symposium on Additive Manufacturing: Quality Control**
**10/30/2023**
**4:00PM–5:45PM – Room 261**

**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*

*Betelhiem 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*

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## TECHNICAL SESSIONS

**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*

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## TECHNICAL SESSIONS

**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 Fais - 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 Fais - 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*

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## TECHNICAL SESSIONS

### 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. Jordon - 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

*Avinkrishnan Ambika Vijayachandran - University of Michigan*

*Anthony Waas - 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*

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## 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*

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## TECHNICAL SESSIONS

**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 Pokkalla - 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*

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## 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 Tsainis - 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*

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## TECHNICAL SESSIONS

**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 Pokkalla - Oak Ridge National Laboratory*

*Seokpum Kim - Oak Ridge National Laboratory*

*Uday Vaidya - The University of Tennessee Knoxville*

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## 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*

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## TECHNICAL SESSIONS

**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*

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## 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**

**The Numerical Modeling and Development of a Post-Lumbar Interbody Fusion Cage Using Laser Powder Bed Fusion**

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 Karibeeeran - Anna University*

*Pradeep Kumar Murugesan - Anna University*

*Jebin Jayakumar - Anna University*

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## TECHNICAL SESSIONS

**03-03-01: Nanomanufacturing: Novel Processes, Applications, and Process-Property Relationships**
**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*

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## TECHNICAL SESSIONS

**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*

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## 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*

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## 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 Techological 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 Wärmefjord - Chalmers University of Technology*

*Rikard Söderberg - Chalmers University of Technology*

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## TECHNICAL SESSIONS

**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*

**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 Wärmefjord - 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*

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## TECHNICAL SESSIONS

### 11:18AM

**Food Quality Inspection and Sorting Using Machine Vision, Machine Learning, and Robotics**

Technical Paper Publication: IMECE2023-113496

*Conor Drogalis - Western New England University*

*Chris Zampino - Western New England University*

*Vedang Chauhan - Western New England University*

### 11:39AM

**A Framework for Human-Robot Teaming Performance Prediction: Reinforcement Learning and Eye Movement Analysis**

Technical Paper Publication: IMECE2023-116636

*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*

### 03-11-01: laser-based advanced manufacturing and materials processing
### 11/2/2023
### 10:15am–12:00pm – room 265

### 10:15AM

**Plasma Interaction and Dynamic Monitoring of Hybrid Laser-Arc Welding of Large-Length Continuous Welds in Large Cruise Ships**

Technical Paper Publication: IMECE2023-110670

*Liangfeng Li - Shanghai Jiao Tong University*

*Jie Shen - Shanghai Ocean University*

*Yansong Zhang - Shanghai Jiao Tong University*

### 10:36AM

**Characterization of Additively Manufactured 18ni Maraging 300 Steel and the Effect of Heat Treatment on the Microstructure and Mechanical Property**

Technical Paper Publication: IMECE2023-111333

*Ryan Walker - University of the District of Columbia*

*Chance Eden - University of the District of Columbia*

*Fisseha Gebre - University of the District of Columbia*

*Jiajun Xu - University of the District of Columbia*

### 10:57AM

**Research on Welding Quality Optimization of Ultra-High Strength Steel Welding Joint Under Different Laser Energy Inputs**

Technical Paper Publication: IMECE2023-111423

*Siliang Li - Tongji University*

*Heng Zhang - Tongji University*

*Xuanjun Pan - Tongji University*

*Qian Wang - Tongji University*

*Haijiang Liu - Tongji University*

### 11:18AM

**Enhancing Sample Efficiency for Temperature Control in DED With Reinforcement Learning and MOOSE Framework**

Technical Paper Publication: IMECE2023-113629

*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*

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## 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 Schopphoven - Fraunhofer Institute for Laser Technology*

*Andres Gasser - Fraunhofer Institute for Laser Technology*

*Reinhart Poprawe - Fraunhofer Institute for Laser Technology*

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

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**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*

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**10:36AM**

**Process Parameters Optimization in 3D Printing of Metallic Parts**

Technical Presentation: IMECE2023-109591

*Khalil Khanafer - University of Michigan*

*Ali Al-Masri - Australian University - Kuwait*

*Joon Soo Park - University of Michigan*

**10:57AM**

**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*

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**11:18AM**

**Challenges in Geometry Assurance of Megacasting**

Technical Presentation: IMECE2023-119587

*Kristina Waermefjord - Chalmers University of Technology*

*Rikard Soederberg - Chalmers University of Technology*

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**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*

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## 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 Shirzadi 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*

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## 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*

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## TECHNICAL SESSIONS

**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*

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## TECHNICAL SESSIONS

**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*

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

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**4:00PM**

**Realization of Production-Capable, Industry-Grade Manufacturing Systems for Advanced Manufacturing Engineering Programs**

Technical Presentation: IMECE2023-118862

*Daniel Cox - Georgia Southern University*

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**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*

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**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*

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## TECHNICAL SESSIONS

**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:

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*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*

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Yue Zhou, The University of Texas at Dallas

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Yunteng Cao

Zhenhai Xia

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**SESSION CHAIRS:**

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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

Baoxing Xu, University of Virginia

Bo Li, Villanova University

Changyong Cao, Case Western Reserve University

Curt Bronkhorst, University of Wisconsin-Madison

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Kevin Long, Sandia National Laboratories

Kun Fu, University of Delaware

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Ling Liu, Temple University

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## TECHNICAL SESSIONS

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

**04-07-01: PROCESS DEVELOPMENT, CHARACTERIZATION, AND OPTIMIZATION FOR ADDITIVE, SUBTRACTIVE, 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*

#### 11:06AM

**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*

#### 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

*Ragavanantham Shanmugam - Fairmont State University*

*Muthuramalingam Thangaraj - 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*

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## 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-Pilanis*

*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 - Sullair*

*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*

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## TECHNICAL SESSIONS

**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*

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## TECHNICAL SESSIONS

**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*

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## TECHNICAL SESSIONS

### 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*

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## TECHNICAL SESSIONS

**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*

*Veeredhi, 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*

*Zhiqing 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*

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## TECHNICAL SESSIONS

**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*

**04-05-02: MATERIALS PROCESSING AND CHARACTERIZATION 10/31/2023**
**2:00PM–3:45PM – ROOM 291**

**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*

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## TECHNICAL SESSIONS

**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*

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## 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 Lozano - The University of Texas Rio Grande Valley*

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## TECHNICAL SESSIONS

**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*

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## 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 Techology Madras*

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## TECHNICAL SESSIONS

### 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*

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## 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*

**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*

**04-29-01: ADDITIVE MANUFACTURING AND 3D PRINTING**
**11/1/2023**
**10:45AM–12:30PM – ROOM 268**

**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*

**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*

**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*

**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*

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## TECHNICAL SESSIONS

**04-05-05:** MATERIALS PROCESSING AND CHARACTERIZATION
11/1/2023
2:00PM–: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 Tabarraei - 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*

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## TECHNICAL SESSIONS

**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*

**04-14-01: ACTIVE MATERIALS FOR BIOINSPIRED AND BIOMIMETIC APPLICATIONS**
**11/1/2023**
**2:00PM–3:45PM – ROOM 269**

**2:00PM**

**Multimaterial 3D/4D Printing for Bioinspired Design**

Technical Presentation: IMECE2023-120098

*Liang Yue - Georgia Institute of Technology*

*Xiaohao Sun - Georgia Institute of Technology*

*H. Jerry Qi - Georgia Institute of Technology*

**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*

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## 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*

**4:21PM**

**Stiffness Degradation in CFRP Laminates Subjected to Fatigue Loading**

Technical Paper Publication: IMECE2023-113377

*Raghu Prakash - IIT Madras*

**4:42PM**

**Elucidation of CNT Fiber Strength Development Mechanism Using Molecular Dynamics.**

Technical Presentation: IMECE2023-119952

*Takumi Ito - Waseda University*

*Toru Ito - Waseda University*

*Akira Kunitomo - Toyota Motor Corporation*

*Atsushi Hosoi - Waseda University*

*Hiroyuki Kawada - Waseda 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*

**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*

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## TECHNICAL SESSIONS

**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 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 Urban-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*

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## 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*

**04-18-01: BIOINSPIRED MATERIALS, STRUCTURES AND APPLICATIONS**
**11/1/2023**
**4:00PM–5:45PM – ROOM 270**

**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*

## TECHNICAL SESSIONS

**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*

### THURSDAY, 11/2/2023

**04-05-07: MATERIALS PROCESSING AND CHARACTERIZATION**
**11/2/2023**
**10:15AM–12:00PM – ROOM 267**

**10:15AM**

**Materials Characterization of Recycled and Mixed Acrylonitrile Butadiene Styrene and Polylactic Acid for Use in Additive Manufacturing**

Technical Paper Publication: IMECE2023-113444

*David Sang - United States Military Academy*

*Parker Llantero - United States Military Academy*

*Adam Eckstein - United States Military Academy*

*Chi Nguyen - United States Military Academy*

*Margaret Nowicki - United States Military Academy*

*Kenneth McDonald - United States Military Academy*

**10:36AM**

**Surface Tension of Liquid Aluminum 7075-T6 Alloy on Different Substrates for In-Space Manufacturing Applications**

Technical Presentation: IMECE2023-116893

*Chukwudalu Uba - University of Louisiana at Lafayette*

**10:57AM**

**Development of Highly Conductive Dry-Spun CNT Yarn by Composite Post-Synthesis Treatment**

Technical Presentation: IMECE2023-119954

*Tempu Miura - Waseda University*

*Rina Tateiwa - Waseda University*

*Hiromu Kobori - TPR Industry Co., Ltd.*

*Toshiaki Shimizu - TPR Industry Co., Ltd.*

*Atsushi Hosoi - Waseda University*

*Hiroyuki Kawada - Waseda University*

**04-29-04: COMPOSITE MANUFACTURING AND PROPERTIES**
**11/2/2023**
**10:15AM–12:00PM – ROOM 268**

**10:15AM**

**Multiscale Finite Element Simulations of Porous Carbon Fiber Reinforced Polypropylene**

Technical Presentation: IMECE2023-120316

*Jiayue Hu - Temple University*

*Ling Liu - Temple University*

*Paul Smith - The University of Southern Mississippi*

*Zhe Qiang - The University of Southern Mississippi*

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## TECHNICAL SESSIONS

**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

*Pooja 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*

**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*

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## TECHNICAL SESSIONS

**04-21-01: PRINTED HYBRID MULTIFUNCTIONAL ELECTRONICS AND ENERGY DEVICES**
11/2/2023
10:15AM–12:00PM – ROOM 290

**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*
*Elliot 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*

**04-05-08: MATERIALS PROCESSING AND CHARACTERIZATION**
11/2/2023
2:00PM–3:45PM – ROOM 267

**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*

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**04-28-01: MODELING AND EXPERIMENTS IN NANOMECHANICS AND NANOMATERIALS**
**11/2/2023**
**2:00PM–3:45PM – ROOM 268**

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**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*

**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*

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**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*

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**04-26-01: INTEGRATED COMPUTATIONAL MATERIALS ENGINEERING (ICME) MINI-SYMPOSIUM**
**11/2/2023**
**2:00PM–3:45PM – ROOM 269**

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**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*

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## TECHNICAL SESSIONS

**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*

**04-21-02**
**11/2/2023**
**2:00PM–3:45PM – ROOM 290**

**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*

*Xiangqun 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*

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## TECHNICAL SESSIONS

**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 Raja - 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*

**04-27-01: MECHANICS OF PENETRATION, SHOCKWAVES, 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*

**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*

**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*

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## TECHNICAL SESSIONS

**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*

**04-23-01**
**11/2/2023**
**4:00PM–5:45PM – ROOM 266**

**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*

**04-19-01: MODELING, SIMULATION, AND DESIGN OF MULTIFUNCTIONAL MATERIALS**
**11/2/2023**
**4:00PM–5:45PM – ROOM 267**

**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*

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## TECHNICAL SESSIONS

**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*

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## TECHNICAL SESSIONS

**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*

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## TECHNICAL SESSIONS

**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 Ikikardaslar - 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

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## TECHNICAL SESSIONS

### 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

### TRACK ORGANIZERS

*Track Organizer: Zhangxian Yuan, Worcester Polytechnic Institute*
*Track Co-Organizer: Yi Wang, University of South Carolina*

**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 Kardomateas, Georgia Institute of Technology*
*Ibrahim Guven, Virginia Commonwealth University*
*Jakson Monteiro*
*Jinwei Shen*
*Jorge Gregório*
*José Páscoa*
*Kawai Kwok*
*Kwek-Tze Tan, The University of Akron*
*Michele Trancossi*
*Mingzhe 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 Chakravarty, 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*

## TECHNICAL SESSIONS

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 Kardomateas, 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
Weiyi Lu, 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

C. Frederic Smith - Rolls-Royce North American Technologies, Inc.

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## TECHNICAL SESSIONS

**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*

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## TECHNICAL SESSIONS

**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*

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## TECHNICAL SESSIONS

**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*

**05-05-01: BEAM, PLATE, AND SHELL STRUCTURES**
**10/30/2023**
**4:00PM–5:45PM – ROOM 263**

**4:00PM**

**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.*

**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*

**4:42PM**

**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*

**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*

## TECHNICAL SESSIONS

**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*

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## TECHNICAL SESSIONS

### 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*

**10:36AM**

**Attitude Control of a Satellite Applying the SDRE and H-Infinity Methods**

Technical Paper Publication: IMECE2023-110236

*Luiz Carlos Gadelha - Federal University of ABC*

*Ximena Celia Mendez Cubillos - OPENCADD Advanced Technology*

**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*

**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*

## TECHNICAL SESSIONS

**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 Schaffarzick - 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*

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# TECHNICAL SESSIONS

**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*

## TECHNICAL SESSIONS

**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*

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## TECHNICAL SESSIONS

### 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*

**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*

### 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.*

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## TECHNICAL SESSIONS

### 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 Shiraishi, 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*

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## TECHNICAL SESSIONS

**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*

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*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 Teferra - 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*

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## 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*

**06-02-01: VIBRATION AND ACOUSTICS IN BIOMEDICAL APPLICATIONS**
**10/31/2023**
**2:00PM–3:45PM – ROOM 265**

**2:00PM**

**Mathematical Modeling of the Coupling Between Torsional and Longitudinal Vibration in Ultrasonic Transducers Technical Presentation: IMECE2023-120079**

*Ahmad Gad - Alcon Vision*

*Mikhail Ovchinnikov - Alcon Vision*

**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*

*Amirtahà 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*

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## 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*

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## TECHNICAL SESSIONS

**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 Huayamave - Embry-Riddle Aeronautical University*

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## TECHNICAL SESSIONS

**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*

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## TECHNICAL SESSIONS

### 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**

*Co-Chair: Yuan Feng - Shanghai Jiao Tong University*

**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*

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## TECHNICAL SESSIONS

**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 Electromygraphic 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*

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## 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*

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*

**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*

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## TECHNICAL SESSIONS

**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*

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## 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*

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**06-05-01: BIOMEDICAL DEVICES**
**11/1/2023**
**4:00PM–5:45PM – ROOM 271**

**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*

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## TECHNICAL SESSIONS

**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*

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**06-09-04: COMPUTATIONAL MODELING IN BIOMEDICAL APPLICATIONS - IV**
**11/1/2023**
**4:00PM–5:45PM – ROOM 291**

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**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*

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**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*

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**4:42PM**

**Methodology to Design 3D Printed Joints: A Case Study Applied to Arm Splints for Healthcare**

Technical Paper Publication: IMECE2023-111604

*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 Hurel - Escuela Superior Politécnica del Litoral*

*Jorge Luis Amaya R. - Escuela Superior Politécnica del Litoral*

*Emilio Ramírez - Université Genobre-Alpes*

*Frédéric Vignat - Université Grenoble-Alpes*

*Hernan Lara - Universidad de las Fuerzas Armadas ESPE*

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**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*

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**5:24PM**

**Finite Element Simulation of Compressing an Additively Manufactured Mesostructure**

Technical Paper Publication: IMECE2023-108885

*Anne Schmitz - University of Wisconsin-Stout*

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## 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

*Danqing 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*

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## 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*

*Amirtaha 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*

*Amirtahà 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*

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## TECHNICAL SESSIONS

**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*

**11:39AM**

**Investigating the Effects of Feedback Time Delay in Human Upright Stability Using Virtual Reality**

Technical Paper Publication: IMECE2023-117080

*Kushal Neupane - Miami University*

*James Chagdes - Miami University*

**06-09-01: COMPUTATIONAL MODELING IN BIOMEDICAL APPLICATIONS - I**
**11/2/2023**
**10:15AM–12:00PM – ROOM 272**

**10:15AM**

**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*

**10:36AM**

**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*

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## TECHNICAL SESSIONS

**11:18AM**

**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*

*Amirtahà Taebi - Mississippi State University*

**11:39AM**

**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*

**06-14-01: BIOTECHNOLOGY AND GENERAL APPLICATIONS**
**11/2/2023**
**10:15AM–12:00PM – ROOM 291**

**10:15AM**

**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*

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## 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 Igbax - 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*

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## TECHNICAL SESSIONS

**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 Gharaie - Deakin University*

*Bobak Mosadegh - Cornell University*

*David Guerra-Zubiaga - Kennesaw State University*

*Seyedhamidreza Alaie - New Mexico State University*

*Turaj Ashuri - Kennesaw State University*

*Amir Ali Amiri Moghadam - Kennesaw State University*

**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*

**2:21PM**

**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*

**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*

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## TECHNICAL SESSIONS

**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*

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**06-09-02: COMPUTATIONAL MODELING IN BIOMEDICAL APPLICATIONS - II**
**11/2/2023**
**2:00PM–3:45PM – ROOM 272**

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**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*

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**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*

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## 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 - Luoisiana 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*

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## TECHNICAL SESSIONS

**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*

**06-09-03: COMPUTATIONAL MODELING IN BIOMEDICAL APPLICATIONS - III**
**11/2/2023**
**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

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## TECHNICAL SESSIONS

### 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 Amiri 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 Selekwa, 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

Sohel 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, 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

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## 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 Selekwa, 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 Prodcut 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*

## TECHNICAL SESSIONS

**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*

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## TECHNICAL SESSIONS

**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*

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## 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*

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**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*

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## TECHNICAL SESSIONS

**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*

**07-02-02: NONLINEAR DYNAMICS, CONTROL, AND STOCHASTIC MECHANICS**
**10/30/2023**
**2:00PM–3:45PM – ROOM 265**

**2:00PM**

**Nonlinear Firing Dynamics in a Human Ventricular Neural Model**

Technical Paper Publication: IMECE2023-112697

*Xi Chen - Xi'an Jiaotong University*

*Yeyin Xu - Xi'an Jiaotong University*

*Ying Wu - Xi'an Jiaotong University*

**2:21PM**

**Chaos Detection in Planar Mechanism With Clearance Using Local, Global, and Correlation Dimensions**

Technical Paper Publication: IMECE2023-113054

*Louay S. Yousef - San Diego State University*

**2:42PM**

**Effect of Nonlinearities on the Vibration Reduction Performance of a System With Multiple Nonlinear Tuned Mass Dampers**

Technical Paper Publication: IMECE2023-113634

*Yigitcan Ekici - Roketsan Inc.*

*Ender Cigeroglu - Middle East Technical University*

**3:03PM**

**Effects of Deterministic Gust Modeling for Large, Multi-Rotor Drones**

Technical Paper Publication: IMECE2023-113645

*Samantha Hoang - Seattle University*

*i.y. Shen - University of Washington*

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## TECHNICAL SESSIONS

**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*

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**07-08-01: MULTIBODY DYNAMIC SYSTEMS AND APPLICATIONS**
**10/30/2023**
**2:00PM–3:45PM – ROOM 266**

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**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*

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**2:21PM**

**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*

*Ulysses Lupercio - Kennesaw State University*

*Lucas Schwenck - Kennesaw State University*

*Connor Talley - Kennesaw State University*

*Ayse Tekes - Kennesaw State University*

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**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*

**07-03-02: DESIGN AND CONTROL OF ROBOTS, MECHANISMS, AND STRUCTURES II**
**10/30/2023**
**2:00PM–3:45PM – ROOM 290**

**2:00PM**

**Novel Lockable Passive Joints for Joint Locking-Based Reconfigurable Mechanisms**

Technical Paper Publication: IMECE2023-112738

*Abdur Rosyid - Khalifa University of Science and Technology*

*Bashar El-Khasawneh - Khalifa University of Science and Technology*

**2:21PM**

**Hydro-Structural Design Exploration of Floating Platform for Offshore Energy Systems**

Technical Paper Publication: IMECE2023-112479

*Chandler Cain - The University of Memphis*

*Yong Hoon Lee - The University of Memphis*

**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*

**07-01-03: GENERAL DYNAMICS, VIBRATION, AND CONTROL**
**10/30/2023**
**4:00PM–5:45PM – ROOM 264**

**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 Atónoma 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*

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## TECHNICAL SESSIONS

**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*

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## TECHNICAL SESSIONS

**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*

**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*

**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*

**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*

**5:03PM**

**Tension Control in Filament Winding Using Constant Force Mechanisms**

Technical Paper Publication: IMECE2023-114308

*Siwei Ye - Shanghai Jiao Tong University*

*Yaru Mo - Shanghai Jiao Tong University*

*Haihua Ou - Shanghai Jiao Tong University*

*Shun Bi - Shanghai Jiao Tong University*

*Shane Johnson - Shanghai Jiao Tong 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*

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## TECHNICAL SESSIONS

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**07-09-01: VIBRATIONS OF CONTINUOUS SYSTEMS**
**10/30/2023**
**4:00PM–5:45PM – ROOM 266**

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**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*

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**4:21PM**

**Nonlinear Vibrations of a Shallow Spherical Cap Under Pressure Loading**

Technical Paper Publication: IMECE2023-113288

*Giovanni Iarriccio - University of Modena and Reggio Emilia*

*Antonio Zippo - University of Modena and Reggio Emilia*

*Francesco Pellicano - University of Modena and Reggio Emilia*

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**4:42PM**

**Complex Dynamic Phenomena in Circular Cylindrical Shells**

Technical Paper Publication: IMECE2023-113857

*Francesco Pellicano - Università di Modena e Reggio Emilia*

*Giovanni Iarriccio - University of Modena and Reggio Emilia*

*Antonio Zippo - University of Modena and Reggio Emilia*

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**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*

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**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*

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**07-03-03: DESIGN AND CONTROL OF ROBOTS, MECHANISMS, AND STRUCTURES III**
**10/30/2023**
**4:00PM–5:45PM – ROOM 290**

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**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*

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## TECHNICAL SESSIONS

**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*

## TUESDAY, OCTOBER 31

**07-01-04: GENERAL DYNAMICS, VIBRATION, AND CONTROL
10/31/2023
10:15AM–12:00PM – ROOM 267**

**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*

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## TECHNICAL SESSIONS

**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**

**Development of a Lorawan-Enabled Unmanned Aerial System for Autonomous Real-Time Surveillance and Monitoring**

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*

**07-11-01: CONTROL THEORY AND APPLICATIONS**
**10/31/2023**
**10:15AM–12:00PM – ROOM 268**

**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*

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## TECHNICAL SESSIONS

**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.*

**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*

**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 Crop.*

*Sohel Anwar - Indiana University–Purdue University Indianapolis*

**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.*

*Hazim El-Mounayri - Indiana University–Purdue University Indianapolis*

*Sohel Anwar - Indiana University–Purdue University Indianapolis*

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## TECHNICAL SESSIONS

**11:39AM**

**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*

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**07-03-04: DESIGN AND CONTROL OF ROBOTS, MECHANISMS, AND STRUCTURES IV**
**10/31/2023**
**10:15AM–12:00PM – ROOM 290**

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**10:15AM**

**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*

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**10:36AM**

**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*

**10:57AM**

**Simulating Soft Robotic Finger Joint Using Simplified Model Free Adaptive Control and Finite Element Analysis for Transmission Line Maintenance**

Technical Paper Publication: IMECE2023-112440

*Meenakshi Narayan - Miami University*

*Zhiyuan Yu - Miami University*

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**11:18AM**

**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*

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**07-01-05: GENERAL DYNAMICS, VIBRATION, AND CONTROL**
**10/31/2023**
**2:00PM–3:45PM – ROOM 267**

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**2:00PM**

**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*

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## TECHNICAL SESSIONS

**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*

**07-04-01: FLUID-STRUCTURE INTERACTION**
**10/31/2023**
**2:00PM–3:45PM – ROOM 268**

**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*

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## TECHNICAL SESSIONS

**3:24PM**

**Fluid-Structure Interactions of Flexible and Flexibly-Mounted Structures in the Wake of a Rotating Cylinder**

Technical Presentation: IMECE2023-120092

*Adrian Carleton - University of Massachusetts Amherst*

*Yahya Modarres-Sadeghi - University of Massachusetts Amherst*

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**07-10-02: MOBILE ROBOTS AND UNMANNED GROUND VEHICLES**
**10/31/2023**
**2:00PM–3:45PM – ROOM 269**

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**2:00PM**

**A Comparison of Motion Planning Methods for Autonomous Ground Vehicle Exploration and Search**

Technical Paper Publication: IMECE2023-112606

*Apoorva Khairnar - Virginia Tech*

*Shathushan Sivashangaran - Virginia Tech*

*Azim Eskandarian - Virginia Tech*

---

**2:21PM**

**A Decentralized Multi-Agent Path Planning Approach Based on Imitation Learning and Global Static Feature Extraction**

Technical Paper Publication: IMECE2023-113113

*Bohan Feng - Shanghai Jiao Tong University*

*Youyi Bi - Shanghai Jiao Tong University*

*Mian Li - Shanghai Jiao Tong University*

*Liyong Lin - Contemporary Amperex Technology Co., Limited*

**2:42PM**

**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**

Technical Paper Publication: IMECE2023-114223

*Nalaka Amarasiri - University of Louisiana at Lafayette*

*Alan A. Barhorst - University of Louisiana at Lafayette*

*Raju Gottumukkala - University of Louisiana at Lafayette*

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**3:03PM**

**SWARM Applications Using Commercial Robots**

Technical Paper Publication: IMECE2023-113322

*Emmanuel Augustine - Northern Kentucky University*

*Minchul Shin - Northern Kentucky University*

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**3:24PM**

**Design, Prototyping, and Experiments Using Small-Scale Helical Drive Rover for Multi-Terrain Exploration**

Technical Paper Publication: IMECE2023-114014

*Ashwin Vadlamannati - North Carolina State University*

*Sumedh Beknalkar - North Carolina State University*

*Dustin Best - North Carolina State University*

*Matthew Bryant - North Carolina State University*

*Andre Mazzoleni - North Carolina State University*

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## 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*

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## TECHNICAL SESSIONS

**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*

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## TECHNICAL SESSIONS

**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 Soudbakhsh - 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 Sundarrajan - Colorado State University*

*Daniel Herber - Colorado State University*

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## TECHNICAL SESSIONS

**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*

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**07-18-01: MARINE ELECTROMECHANICAL SYSTEMS AND OCEAN MECHATRONICS**
**11/1/2023**
**10:45AM–12:30PM – ROOM 273**

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**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*

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**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*

**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*

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**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*

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**07-17-02: MACHINE LEARNING AND ARTIFICIAL INTELLIGENCE IN DYNAMICS, VIBRATIONS, AND CONTROL**
**11/1/2023**
**2:00PM–3:45PM – ROOM 272**

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**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*

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## TECHNICAL SESSIONS

**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**

**2:00PM**

**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*

**2:21PM**

**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*

**2:42PM**

**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*

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## TECHNICAL SESSIONS

**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*

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**07-17-03: MACHINE LEARNING AND ARTIFICIAL INTELLIGENCE IN DYNAMICS, VIBRATIONS, AND CONTROL**
**11/1/2023**
**4:00PM–5:45PM – ROOM 272**

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**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*

---

**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*

**4:42PM**

**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*

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**5:03PM**

**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*

---

**5:24PM**

**Cast Silicone Robotic Gripper in Underwater Applications**

Technical Paper Publication: IMECE2023-113331

*Wen Liu - Northern Kentucky University*

*Minchul Shin - Northern Kentucky University*

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## TECHNICAL SESSIONS

### 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

8-10:　Advance Materials for Electrochemical Energy

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

8-21:　Nuclear Energy Forum: Plants, Design, Analysis, and Safety

### 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 McTigue*

*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*

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## 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

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## 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

**New Tip for More Efficient and Less Environmental Impact Gas Flaring Process**

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 $CO_2$ 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*
*Crístofer 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 Steward - Western Kentucky University*
*Boston Wimmer - Western Kentucky University*

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## 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*

## TECHNICAL SESSIONS

**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*

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## TECHNICAL SESSIONS

**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*

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## TECHNICAL SESSIONS

**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

*Xiango 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*

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## TECHNICAL SESSIONS

**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 Arlingtion*

*Gozdem Kilaz - Purdue University*

*Jason Ostanek - Purdue University*

**5:24PM**

**Investigating Na+ Ion Storage Behavior of Distinctive Hybrid Structure of $WS_2NT$ 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*

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## TECHNICAL SESSIONS

**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*

**08-11-01:** ELECTRIC VEHICLE BATTERIES AS MULTIFUNCTIONAL ENERGY STORAGES
**10/31/2023**
**10:15AM–12:00PM – ROOM 271**

**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*

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## TECHNICAL SESSIONS

**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*

**08-09-04: ELECTROCHEMICAL ENERGY STORAGE AND CONVERSION SYSTEMS**
**10/31/2023**
**2:00PM–3:45PM – ROOM 270**

**2:00PM**

**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*

**2:21PM**

**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*

**2:42PM**

**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*

**3:03PM**

**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*

**3:24PM**

**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*

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## TECHNICAL SESSIONS

**08-11-02:** ELECTRIC VEHICLE BATTERIES AS MULTIFUNCTIONAL ENERGY STORAGES
10/31/2023
2:00PM–3:45PM – ROOM 271

### 2:00PM

**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 Voyiadjis - 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*

### 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*

**08-13-01:** MULTI-ENERGY SYSTEMS
10/31/2023
4:00PM–5:45PM – ROOM 270

### 4:00PM

**Solar Driven Polygeneration System Using $sCO_2$ 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

**Optimization of the Design and Operation of Multi-Energy Systems Integrated With Energy Networks: Retrofit Design Problem**

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*

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**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.*

**08-16-01: SOLAR THERMAL**
**10/31/2023**
**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*

**4:42PM**

**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*

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## TECHNICAL SESSIONS

### WEDNESDAY, NOVEMBER 1

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**08-10-01: ADVANCE MATERIALS FOR ELECTROCHEMICAL ENERGY**
11/1/2023
10:45AM–12:30PM – ROOM 274

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**10:45AM**

**Deformation and Fracture Characteristics of Li-Ion Battery Solid Electrolytes**

Technical Presentation: IMECE2023-120286

*Shuman Xia - Georgia Institute of Technology*

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**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*

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**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*

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**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*

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**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*

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**08-05-02: ENERGY-RELATED MULTIDISCIPLINARY II**
11/1/2023
10:45AM–12:30PM – ROOM 275

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**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*

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**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*

## TECHNICAL SESSIONS

**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-Parás - 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*

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## TECHNICAL SESSIONS

**11:48AM**

**Packed Bed Storage Systems and its Modelling Approaches: A Review of Navier- Stokes Equation and Turbulence Equations in Porous Media**

Technical Paper Publication: IMECE2023-109148

*Nurayn Tiamiyu - University of Oklahoma*

*Jaap 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*

**08-19-01: INNOVATIONS FOR CLEANER ENERGY CONVERSION TECHNOLOGIES**
**11/1/2023**
**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*

**11:27AM**

**Defect Engineering of $WO_3$ 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*

*Jaxiry 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*

## 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*

**08-05-01: ENERGY-RELATED MULTIDISCIPLINARY I**
**11/1/2023**
**2:00PM–3:45PM – ROOM 274**

**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*

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## TECHNICAL SESSIONS

**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*

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## TECHNICAL SESSIONS

**2:21PM**

**Repurposed Desalination Salt: A Low-Cost Thermal Energy Storage Medium**

Technical Paper Publication: IMECE2023-114187

*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*

**2:42PM**

**Exploring Inexpensive Carbon Materials for Improving the Performance of Perovskite Solar Cells**

Technical Presentation: IMECE2023-120062

*Saket Chand Mathur - Wichita State University*

*Wei Wei - Wichita State University*

**3:03PM**

**Prediction of the Maximum Energy Harvest Considering Year-Around Sky Coverage Conditions and Optimized Setup Angles of Fixed PV Panels**

Technical Paper Publication: IMECE2023-112167

*Ammar Gwesha - The University of Arizona*

*Peiwen Li - The University of Arizona*

*Yasir Alfulayyih - The University of Arizona*

**3:24PM**

**Energy Sensors and Absorbers Based on Nanoscale Magnetic Tunnel Junction Metamaterials**

Technical Paper Publication: IMECE2023-117058

*Betelhiem N. Mengesha - University of the District of Columbia*

*Juan Estevez Hernandez - University of the District of Columbia*

*Arnold Feutmba - University of the District of Columbia*

*Pawan Tyagi - University of the District of Columbia*

**08-19-02: INNOVATIONS FOR CLEANER ENERGY CONVERSION TECHNOLOGIES**
**11/1/2023**
**2:00PM–3:45PM – ROOM 290**

**2:00PM**

**Artificial Intelligence Based Modelling for Energy Output Predictions of Renewables**

Technical Paper Publication: IMECE2023-112607

*George-Rafael Domenikos - Stevens Institute of Technology*

*Shima Hajimirza - Stevens Institute of Technology*

*Gizem Acar - Stevens Institute of Technology*

**2:21PM**

**Unmanned Aerial Vehicles (UAVs) in Smart Factories: Exploring the Potential for Energy Savings Through Wireless Communication Technologies**

Technical Paper Publication: IMECE2023-113128

*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*

## 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*

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## 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 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*

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## TECHNICAL SESSIONS

**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

**Evaluation of the Impact of COVID-19 on the Automotive Industry: Analysis of the Effects of Confinement on a Hybrid Vehicle**

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*

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## TECHNICAL SESSIONS

### 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*

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## TECHNICAL SESSIONS

**10:36AM**

**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*

**10:57AM**

**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*

**11:18AM**

**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*

**11:39AM**

**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*

**08-08-02:** DESIGN ANALYSIS AND OPTIMIZATION OF ENERGY CONVERSION SYSTEMS - 2
**11/2/2023**
**10:15AM–12:00PM – ROOM 276**

**10:15AM**

**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*

**10:36AM**

**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*

**10:57AM**

**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*

**11:18AM**

**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*

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## TECHNICAL SESSIONS

**11:39AM**

**Thermomechanical Performance of Full-Size Curved Fuel Plates**

Technical Presentation: IMECE2023-109798

*Hakan Ozaltun - Idaho National Laboratory*

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**08-18-02: INDOOR ENVIRONMENTAL QUALITY AND BUILDING MATERIALS FOR ENERGY SUSTAINABILITY**
**11/2/2023**
**2:00PM–3:45PM – ROOM 273**

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**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*

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**2:21PM**

**The Impact of Indoor Environment on Engineering Students' Inhibition Control Ability**

Technical Paper Publication: IMECE2023-113055

*Mehri Mobaraki-Omoumi - The University of Oklahoma*

*Md Tanvir Ahad - The University of Oklahoma*

*Javeed Kittur - The University of Oklahoma*

*Zahed Siddique - The University of Oklahoma*

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**2:42PM**

**CFD-Based Ventilation Assessment of a University Building With an Integrated Windcatcher in Egypt**

Technical Paper Publication: IMECE2023-113719

*Moataz Eldakroury - 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*

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**08-21-01: NUCLEAR ENERGY FORUM: PLANTS, DESIGN, ANALYSIS, AND SAFETY**
**11/2/2023**
**2:00PM–3:45PM – ROOM 274**

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**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*

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## TECHNICAL SESSIONS

**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 Bolisetti - 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*

**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*

**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*

**08-08-03: DESIGN ANALYSIS AND OPTIMIZATION OF ENERGY CONVERSION SYSTEMS - 3**
**11/2/2023**
**2:00PM–3:45PM – ROOM 275**

**2:00PM**

**Design Improvement and Field Testing for Biogas Power Generation System**

Technical Paper Publication: IMECE2023-111642

*Yuxin Song - Saint Martin's University*

*Shawn Duan - Saint Martin's 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*

*Krishnil Ram - The University of the South Pacific*

*Mohammed Rafiuddin Ahmed - The University of the South Pacific*

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## TECHNICAL SESSIONS

**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*

**08-08-04: DESIGN ANALYSIS AND OPTIMIZATION OF ENERGY CONVERSION SYSTEMS - 4**
**11/2/2023**
**4:00PM–5:45PM – ROOM 273**

**4:00PM**

**Safety Evaluation of Isolated Island Operation on 1000MW Steam Turbine in NPP**

Technical Paper Publication: IMECE2023-109151

*Xiaodan Hu - Wuhan University*

*Xu Chen - Wuhan University*

*Fan Wu - Wuhan University*

*Rui Shi - Wuhan University*

*Wei Jiang - Wuhan University*

*Tao Chen - Wuhan University*

*Yanan Yue - Wuhan University*

*Danmei Xie - Wuhan University*

**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*

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# TECHNICAL SESSIONS

## 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

9-5:   Applied Mechanics, Dynamic Systems, Experimental and Computational Methods, Advanced Materials, and Testing

9-6:   Fluid Mechanics, Aerospace Systems, Thermodynamics, Heat Transfer, Energy Systems, and Renewable Energy Applications

9-7:   Problem Solving Techniques in Engineering and Technology Education, Research Methodologies, Practice, Workshops, and Seminars

9-8: and   Distance/Online Engineering Education, Models 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

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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

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Wael Mokhtar, Grand Valley State University

Zeki Ilhan, Midwestern State University

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## 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*

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## 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 Rodriguez - 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 - Unversity of Iowa*

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## 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

*Carl 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*

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## TECHNICAL SESSIONS

**4:42PM**

**Rules and Procedures in Academia: Do They Help or Hurt?**

Technical Paper Publication: IMECE2023-113587

*Shuvra Das - University of Detroit*

*Darrell Klinke - University of Detroit Mercy*

*David Pistrui - 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*

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**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 Senthilvel Kavitha - Drexel University*

*Nijanthan Vasudevan - Drexel University*

*Tzu-Liang (Bill) Tseng - The University of Texas at El Paso*

*Yunshun Chiou - Drexel University*

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## TECHNICAL SESSIONS

### 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},

*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*

## TECHNICAL SESSIONS

**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

**09-01-04:** CURRICULUM INNOVATIONS, PEDAGOGY, AND LEARNING METHODOLOGIES - IV
**10/31/2023**
**2:00PM–3:45PM – ROOM 272**

**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 Kilicay-Ergin - The Pennsylvania State University

Neeraj Sonalkar - Stanford University

**3:03PM**

## TECHNICAL SESSIONS

**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*

### 3:24PM

**Worldwide Lean Learning Factories**

Technical Paper Publication: IMECE2023-112983

*Gabriela R. Witeck - University of Minho*

*Anabela C. Alves - University of Minho*

**09-10-01: TEACHING LABORATORIES, HANDS-ON EXPERIENCES, EMBEDDING NOVEL MANUFACTURING CONCEPTS IN ME PROGRAMS, AND TECHNOLOGY-AIDED LECTURING**
**10/31/2023**
**2:00PM–3:45PM – ROOM 273**

### 2:00PM

**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*

### 2:21PM

**An Inexpensive Multidisplinary 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*

### 2:42PM

**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*

### 3:03PM

**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*

### 3:24PM

**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 Burlton - Midwestern State University*

*Salim Azzouz - Midwestern State University*

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## TECHNICAL SESSIONS

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**09-11-01: K-12 OUTREACH AND ENGINEERING INNOVATION**
**10/31/2023**
**4:00PM–5:45PM – ROOM 272**

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**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*

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**4:42PM**

**Cubesat Summer Camp: A Week-Long Engineering Program for Middle and High Schoolers**

Technical Presentation: IMECE2023-116507

*Asheesh Lanba - University of Southern Maine*

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**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*

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**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*

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**09-12-01: MECHATRONICS, AUTOMATION, ROBOTICS, AND CONTROL ENGINEERING**
**10/31/2023**
**4:00PM–5:45PM – ROOM 273**

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**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*

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## TECHNICAL SESSIONS

**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*

*Lynnane 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*

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## TECHNICAL SESSIONS

### 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*

## TECHNICAL SESSIONS

### 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*

### 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**

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**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*

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**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*

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**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*

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**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*

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## 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

**10-04-01: FLUID MEASUREMENTS AND INSTRUMENTATION**
**10/30/2023**
**10:45AM–12:30PM – ROOM 270**

**10:45AM**

**Experimental Demonstration of a Novel Elastohydrodynamic Seal Concept for sCO$_2$ 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 Akbor 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

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## TECHNICAL SESSIONS

**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 Laboraotry*

### 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*

*Saurabh Nath - Massachusetts Institute of Technology*

*Tal Joseph - Massachusetts Institute of Technology*

*Kripa Varanasi - Massachusetts Institute of Technology*

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## TECHNICAL SESSIONS

**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*

**2:42PM**

**CFD Simulation and Optimization of a Cake Filtration System**

Technical Paper Publication: IMECE2023-112836

*Enoch Ogunnowo - McNeese State University*

*Damilare Awodele - McNeese State University*

*Vipan Parajuli - McNeese State University*

*Ning Zhang - McNeese State 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*

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## TECHNICAL SESSIONS

**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*

**10-03-01: DNS, LES, AND HYBRID-RANS/LES METHODS FOR CFD**
**10/30/2023**
**2:00PM–3:45PM – ROOM 279**

**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*

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## TECHNICAL SESSIONS

**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 Mauersberger - Hochschule Mittweida, University of Applied Sciences*

*Karsten Oehlert - Jade University of Applied Sciences*

**10-06-01: MICROFLUIDICS 2023 - FLUID ENGINEERING IN MICRO- AND NANOSYSTEMS**
**10/30/2023**
**4:00PM–5:45PM – ROOM 270**

**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*

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## 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*

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## TECHNICAL SESSIONS

**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 Electrocoalesence 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*

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## TECHNICAL SESSIONS

### 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 Yildizeli - 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*

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## TECHNICAL SESSIONS

**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 Allaf - Western University at Ontario*

*Mohammad Hossain - Western University at Ontario*

*Christopher Thomas Degroot - Western University at Ontario*

*Hassan Peerhossaini - Western University at Ontario*

**10-05-03: 29TH SYMPOSIUM ON FUNDAMENTAL ISSUES AND PERSPECTIVES IN FLUID MECHANICS - III**
**10/31/2023**
**4:00PM–5:45PM – ROOM 274**

**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*

**4:21PM**

**A Lattice Boltzmann Model for Weakly Ionized Low-Temperature Plasma in Confined Domain**

Technical Presentation: IMECE2023-109037

*Leitao Chen - Tennessee State University*

**4:42PM**

**Evaluation Aerodynamic Coefficients for Ss T-09 Ts Fin Profile**

Technical Paper Publication: IMECE2023-112564

*Victor Santiago - Instituto Militar de Engenharia*

*Bernardo Alves - Instituto Militar de Engenharia*

*Andre Rezende - Instituto Militar de Engenharia*

**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

*Mujgan Guner - 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*

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## TECHNICAL SESSIONS

**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*

**10-09-02:** MULTIPHASE FLOWS AND APPLICATIONS
**11/1/2023**
**2:00PM–3:45PM – ROOM 276**

**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. González - 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*

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## TECHNICAL SESSIONS

**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*

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**10-10-02: INDUSTRIAL FLOWS**
**11/1/2023**
**2:00PM–3:45PM – ROOM 277**

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**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*

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**2:21PM**

**Virus Transmission Aboard a Transit Bus**

Technical Paper Publication: IMECE2023-111308

*Jeremy Bonifacio - California State University, Long Beach*

*Hamid Rahai - California State University, Long Beach*

*Raymond Horstman - California State University, Long Beach*

**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*

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**10-09-03: MULTIPHASE FLOWS AND APPLICATIONS**
**11/1/2023**
**4:00PM–5:45PM – ROOM 276**

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**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*

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## TECHNICAL SESSIONS

**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
**11/1/2023**
**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*

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## TECHNICAL SESSIONS

**Track 11: Heat Transfer and Thermal Engineering**

Topics:

11-1:    Single-Phase Enhanced Heat Transfer Equipment

11-2:    Multi-Scale Multi-Phase Heat Transfer Equipment

11-3:    Heat and Mass Transfer in Porous Media

11-4:     Advanced Heat Exchangers for Decarbonization

11-5:    AI/ML Applications in Combustion Power and Propulsion Systems

11-6:    Emissions Reduction Technologies and Decarbonization

11-7:    Industrial and Applied Combustion Systems

11-8:    Hypersonic Re-entry Heat Transfer Phenomena

11-9:    Fundamentals of Single Phase Convection

11-10:  Thermal Management in Aerospace Applications

11-11:  Endothermic Fuels

11-12:  Advances in Batteries

11-13:  Terrestrial Application of Heat Transfer

11-14:   Machine Learning/AI Applications in Aerospace Heat Transfer

11-15:  Enhancements in Nano/Micro-to-Macroscale Condensation Heat Transfer

11-16:  Passive and Active Two-Phase Cooling: Heat Pipes, Pumped Two-Phase Loops

11-17:  Spray Impingement Heat Transfer for High Heat Flux Dissipation

11-18:  Flow Boiling Studies in Mini- and Microscale Channels

11-19:  Solid/Liquid Phase Change Processes With Applications

11-20:  Gas Turbine Heat Transfer

11-21:  Transport Phenomena in Manufacturing and Materials Processing

11-22:   Transport Phenomena in Additive Manufacturing

11-23:   Processing of Frontier Materials

11-24:   Processing of Energy Materials

11-25:   Heat Transfer in Electronic Equipment

11-26:   Heat and Mass Transfer in Natural and Built Environments

11-27:   Direct Carbon Removal From Ambient

11-28:  Energy Recovery Systems: Fundamental and Applications

11-29:  Inverse Problems in Heat Transfer

11-30:  Computational Heat Transfer – Applications

11-31:  Computational Methods for Materials Development

11-32:  Heat Transfer in Hypersonic Flows

11-33:  Applications of Machine Learning/Artificial Intelligence for Heat Transfer Problems

11-34:  High Performance Computing for Heat Transfer

11-35:  Student Competition Session

11-36:  Photo Gallery for Heat and Mass Transfer

11-37:  Production, Storage, and Transportation of Liquid Hydrogen

11-38:  Ultrahigh Temperature Thermal Energy Recovery and Storage

11-39:  Heat Transfer in Complex Thermochemical Conversion

11-40:  Heat Transfer in Solar Thermochemistry/Energy

11-41:  Heat Transfer Optimization Leveraging Additive Manufacturing and Topology Optimization

11-42:  Heat and Mass Transfer in Heating, Cooling, and Power Systems

11-43:  Heat Transfer in Battery Management and Energy Storage Technology

11-44:  Radiative Heat Transfer in Energy System

11-45:  Technique Development for Thermophysical Characterization

11-46:  Thermophysical Properties: From Macro Down to Micro- and Nanoscale

11-47:  Fundamentals of Single-Phase Convection

11-48:  Fundamentals of Thermal Transport in Porous Media

11-49:  Fundamental of Thermal Transport With Applications to Atmospheric Processes

11-50:  Fundamentals of Radiative Heat Transfer Including Nanoscale Phenomena

11-51:  Fundamentals of Cryogenic Heat Transfer

11-52:  Fundamentals of Adsorption/Absorption

11-53:  Fundamentals of Machine Learning for Heat Transfer

11-54:  Fundamentals of Machine Learning for

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## 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

`11-66: Panel: Contemporary Issues Involving Nanoscale Heat Transfer

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:

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*Amitabh Narain, Michigan Technological University*

*An Zou, Syracuse University*

*Andrey Kuznetsov*

*Ankur Jain, The University of Texas at Arlingtion*

*Arun Muley, Boeing Research and Technology*

*Ashwani Gupta, University of Maryland*

*Atul Kohli*

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*Hamidreza Najafi, Florida Institute of Technology*

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Prashant Singh, The University of Tennessee

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Ryo Amano, University of Wisconsin-Milwaukee

S.A. Sherif, University of Florida

Sang Muk Kwark

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Tariq Shamim, Northern Illinois University
Tengfei Luo, University of Notre Dame
Tianli Feng, The University of Utah
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Troy Munro, Brigham Young University
Vaibhav Bahadur, The University of Texas at Austin
Vinod Srinivasan, University of Minnesota
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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

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## 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*

**12:09PM**

**Study of Phase Change Materials for Heat Dissipation of Systems With Transient Heat Generation**

Technical Paper Publication: IMECE2023-114299

*Ethan Trulson - Florida Polytechnic University*

*Gerardo Carbajal - Florida Polytechnic University*

*Younggil Park - Florida Polytechnic University*

*Edwar Romero-Ramirez - Florida Polytechnic University*

*Alexander Nees - Florida Polytechnic University*

**11-45-01: TECHNIQUE DEVELOPMENT FOR THERMOPHYSICAL CHARACTERIZATION**
**10/30/2023**
**10:45AM–12:30PM – ROOM 273**

**10:45AM**

**Measurement of Thermomechanical Response to Periodic Heating in Semiconductors and Dielectrics**

Technical Presentation: IMECE2023-119973

*Wyatt Hodges - Sandia National Laboratories*

*Amun Jarzembski - Sandia National Laborotories*

*Ben Treweek - Sandia National Laborotories*

*Brenden Herkenhoff - Sandia National Laborotories*

*Greg Pickrell - Sandia National Laborotories*

**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: IMECE2023-111923

*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 - Th 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*

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## TECHNICAL SESSIONS

**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 CH$_4$/Air Flames**

Technical Paper Publication: IMECE2023-113230

*Ahmed Abdelhalim - King Fahd University of Petroleum and Minerals*

*Ahmed Abdelhafez - 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 CO$_2$ 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*

**3:03PM**

**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*

**3:24PM**

**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**
**2:00PM–3:45PM – ROOM 273**

**2:00PM**

**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*

**2:21PM**

**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*

**2:42PM**

**Characterization of Functionalized Nanodiamonds in Mineral Oils for Transformer Applications**

Technical Paper Publication: IMECE2023-113527

*Patrick Swiecichowski - Tennessee Techological University*

*Miles Nevills - Tennessee Technological University*

*Ethan Languri - Tennessee Technological University*

*Jim Davidson - FemtoSci*

*Lino Costa - University of Tennessee Space Institute*

*David Kerns - FemtoSci*

**3:03PM**

**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*

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## TECHNICAL SESSIONS

**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 NH₃/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*

## TECHNICAL SESSIONS

**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 Miho*

*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*

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## 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*

## TECHNICAL SESSIONS

**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*

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**11-47-01: PHASE CHANGE HEAT TRANSFER**
**10/31/2023**
**10:15AM–12:00PM – ROOM 277**

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**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*

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**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 Unversity*

**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 Marin - Massachusetts Institute of Technology*

*Gang Chen - Massachusetts Institute of Technology*

*Jeff Punch - University of Limerick*

*Vanessa Egan - University of Limerick*

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**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*

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**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*

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## TECHNICAL SESSIONS

**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 Zolfagharroshan - 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 Diamaru - 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 (AMDROHP) CubeSat**

Technical Paper Publication: IMECE2023-114220

*Spencer Miesner - California State University, Los Angeles*

*Gabriella 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 - Missori 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*

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## TECHNICAL SESSIONS

**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 Faqihi - 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*

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## TECHNICAL SESSIONS

**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*

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**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*

*Soohwan 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*

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## TECHNICAL SESSIONS

### 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

*Solmaz 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*

*Debjyoti 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*

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# TECHNICAL SESSIONS

**2:42 PM**

**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*

**3:03PM**

**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*

**11-58-01: NANOSCALE THERMAL TRANSPORT**
**11/1/2023**
**2:00PM–3:45PM – ROOM 279**

**2:00PM**

**Phonon Scattering Engineered Thermal Radiative Transport at Nanoscales**

Technical Presentation: IMECE2023-120068

*Dudong Feng - Purdue University*

*Xiulin Ruan - Purdue University*

**2:21PM**

**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*

**2:42PM**

**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*

**3:03PM**

**Dual-Mode Operando Thermometry and Reaction Monitoring for Probing Thermal Contributions to Plasmonic Photocatalysis**

Technical Presentation: IMECE2023-119760

*Andrea Pickel - University of Rochester*

**3:24PM**

**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*

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## 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 Exchnager Operated With $Al_2O_3$ 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 Butcher - 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 Butcher - California State Polytechnic University, Pomona*

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## TECHNICAL SESSIONS

**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*

*Zhuo 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*

*Xiulin 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*

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# 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*

**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*

**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*

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## TECHNICAL SESSIONS

### 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*

**11:39AM**

**Pulsed Flash Two-Phase Cooling for Thermal Management of Electronics**

Technical Presentation: IMECE2023-117135

*Rishi Pugazhendhi - University of California, Los Angeles*

*Timothy S Fisher - University of California, Los Angeles*

*Subramanian S. Iyer - 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 Swcnt 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*

**11-67-01: NOVEL VERIFICATION, VALIDATION, AND UNCERTAINTY QUANTIFICATION (VVUQ) TECHNIQUES AND APPROACHES FOR FLUIDS APPLICATIONS, HEAT TRANSFER, AND THERMAL ENGINEERING**
**11/2/2023**
**10:15AM–12:00PM – ROOM 279**

**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*

**10:36AM**

**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*

*Adwait Patil - Virginia Tech*

*Advait Borole - Virginia Tech*

*Monica Shanmugam - Virginia Tech*

**10:57AM**

**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*

**11:18AM**

**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*

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## TECHNICAL SESSIONS

**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**

Numerical Simulation Research on Thermal Energy Storage Characteristics of a Cascaded Packed Bed With Phase Change Material

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*

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## 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 Hongkong University of Science and Technology*

*Guang Wang - The Hongkong 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*

## TECHNICAL SESSIONS

**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*

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## 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*

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## TECHNICAL SESSIONS

### 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: Multiphyics 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 (VVUQ) 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*

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*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*

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## TECHNICAL SESSIONS

Jun Li, University of Massachusetts Dartmouth

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Victor Lefevre, Northwestern University

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Wanliang Shan, Syracuse University

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Yongjie Zhang

Yozo Mikata, Fluor

Yuan Gao, University of Illinois

Yuhang Hu, Georgia Institute of Technology

Yuris Dzenis, University of Nebraska-Lincoln

### SESSION CHAIRS:

Alireza Tabarraei, The University of North Carolina at Charlotte

Caglar Oskay, Vanderbilt University

Danial Faghihi, University at Buffalo

Dianyun Zhang, Purdue University

Evgueni Filipov, University of Michigan

Fei Song, Schlumberger Limited

Florin Bobaru, University of Nebraska-Lincoln

Glaucio Paulino, Georgia Institute of Technology

Guruswami Ravichandran, Caltech

Huanyu Cheng, The Pennsylvania State University

Huck Beng Chew

Huijuan Zhao, Clemson University

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Jiaze He, The University of Alabama

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Ryan Elliott, University of Minnesota, Twin Cities

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Yuan Gao, University of Illinois

Yuhang Hu, Georgia Institute of Technology

Yuris Dzenis, University of Nebraska-Lincoln

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## 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*

**11:27AM**

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**

Phase-Field DeepONet: Physics-Informed Deep Operator Neural Network for Fast Simulations of Pattern Formation Governed by Gradient Flows of Free-Energy Functionals

Technical Presentation: IMECE2023-113178

*Wei Li - Northeastern University*

*Martin Z. Bazant - Massachusetts Institute of Technology*

*Juner Zhu - Northeastern University*

### 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*

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## TECHNICAL SESSIONS

**11:48AM**

**Probing Material Damage After Violently Collapsing Cavitation in Soft Viscoelastic Materials**

Technical Presentation: IMECE2023-113941

*Jin Yang - The University of Texas at Austin*

**12:09PM**

**Physics-Informed Data-Driven Constitutive Modeling of Strain Rate Sensitive Soft Materials**

Technical Presentation: IMECE2023-113977

*Kshitiz Upadhyay - Louisiana State University*

*Jan Niklas Fuhg - Cornell University*

*Nikolaos Bouklas - Cornell University*

*K.T. Ramesh - Johns Hopkins University*

**12-03-02: DATA-ENABLED PREDICTIVE MODELING, SCIENTIFIC MACHINE LEARNING, AND UNCERTAINTY QUANTIFICATION IN COMPUTATIONAL MECHANICS**
**10/30/2023**
**2:00PM–3:45PM – ROOM 274**

**2:00PM**

**Multi-Material Design Under Uncertainty of Building Envelopes Thermal Insulation**

Technical Presentation: IMECE2023-112401

*Danial Faghihi - University at Buffalo*

*Jingye Tan - University at Buffalo*

**2:21PM**

**Self-Directed Online Machine Learning**

Technical Presentation: IMECE2023-120350

*Wei Lu - University of Michigan*

**2:42PM**

**Discovery of Multi-Functional Polyimides Through High-Throughput Screening Using Explainable Machine Learning**

Technical Presentation: IMECE2023-119686

*Ying Li - University of Wisconsin-Madison*

**3:03PM**

**Physics Informed Neural Networks for Uncertainty Propagation for Alleviating the Curse of Dimensionality**

Technical Presentation: IMECE2023-113365

*Kirubel Teferra - U.S. Naval Research Laboratory*

**3:24PM**

**Computational Ultrasonic Neuromodulation**

Technical Presentation: IMECE2023-120156

*(Amir)Hossein Salahshoor - Duke University*

**12-10-01: GENERAL: MECHANICS OF SOLIDS, STRUCTURES, AND FLUIDS**
**10/30/2023**
**2:00PM–3:45PM – ROOM 275**

**2:00PM**

**Identification of the Viscoplastic, Post-Necking Behavior of a Semicrystalline Thermoplastic Using Only Nominal Mechanical Measurements**

Technical Presentation: IMECE2023-119935

*Kenneth Cundiff - Sandia National Laboratories*

*Georges Ayoub - University of Michigan-Dearborn*

*Amine Benzerga - Texas A&M University*

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## 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*

**12-03-03:** DATA-ENABLED PREDICTIVE MODELING, SCIENTIFIC MACHINE LEARNING, AND UNCERTAINTY QUANTIFICATION IN COMPUTATIONAL MECHANICS
**10/30/2023**
**4:00**PM–**5:45**PM – 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*

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## 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*

**5:03PM**

**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*

**5:24PM**

**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*

**12-10-02:** GENERAL: MECHANICS OF SOLIDS, STRUCTURES, AND FLUIDS
**10/30/2023**
**4:00PM–5:45PM – ROOM 275**

**4:00PM**

**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*

**4:21PM**

**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*

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## TECHNICAL SESSIONS

**4:42PM**

**Mechanical, Structural, and Electronic Coupling During Metal-Insulator Transitions in VO$_2$ 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*

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## TECHNICAL SESSIONS

**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*

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**12-18-01: MECHANICS OF SOFT MATERIALS**
**10/31/2023**
**10:15AM–12:00PM – ROOM 279**

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**10:15AM**

**Nonlinear Mechanics of Remodeling**

Technical Presentation: IMECE2023-120053

*Aditya Kumar - Georgia Institute of Technology*
*Arash Yavari - Georgia Institute of Technology*

**10:36AM**

**Interfacial Shear Stress Transfer Between Elastoplastic Fiber and Elastic Matrix**

Technical Presentation: IMECE2023-120060

*Yong Zhu - North Carolina State University*

**10:57AM**

**Strain-Programmable Particle Transport in Hydrogels**

Technical Presentation: IMECE2023-120173

*Shaoting 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*

*Isabella Burda - Cornell University*

*Adrienne Roeder - Cornell University*

*Meredith Silberstein - Cornell University*

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**12-10-04: GENERAL: MECHANICS OF SOLIDS, STRUCTURES, AND FLUIDS**
**10/31/2023**
**2:00PM–3:45PM – ROOM 278**

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**2:00PM**

**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*

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## TECHNICAL SESSIONS

**2:21PM**

**Relaxation Effects of Soft Artificial Fabric Muscle Actuators for Launch and Recovery Systems**

Technical Paper Publication: IMECE2023-113768

*Michael Smith - Naval Undersea Warfare Center*

*Paul Cavallaro - Naval Undersea Warfare Center*

*Allison Redington - Naval Undersea Warfare Center*

*Jacob O'Donnell - Naval Undersea Warfare Center*

*Eric Warner - Naval Undersea Warfare Center*

**2:42PM**

**Mechanics of Piezo-Electrochemistry to Enable Li Metal Battery**

Technical Presentation: IMECE2023-120337

*Wei Lu - University of Michigan*

**3:03PM**

**Discrete Element Method-Based Investigation of Settling Powder Packs in Thermally Damaged Detonators**

Technical Presentation: IMECE2023-119722

*Ki Wolf - Sandia National Laboratories*

*Joel Clemmer - Sandia National Laboratories*

*Mike Hobbs - Sandia National Laboratories*

*Dan Bolintineanu - Sandia National Laboratories*

*Judith Brown - Sandia National Laboratories*

**12-18-02: MECHANICS OF SOFT MATERIALS**
**10/31/2023**
**2:00PM–3:45PM – ROOM 279**

**2:00PM**

**Effect of Defect Geometry on the Tensile Failure of Polydimethylsiloxane (PDMS)**

Technical Presentation: IMECE2023-119790

*Tina Ko - The University of Texas at Arlington*

*Yukti Shinglot - The University of Texas at Arlington*

*Ashfaq Adnan - The University of Texas at Arlington*

**2:21PM**

**Fully Water-Based, High-Temperature Thermoset Sealant Resin**

Technical Presentation: IMECE2023-113327

*Elizabeth Contreras - Aramco Americas*

*Thomas Heinold - Saudi Aramco*

**2:42PM**

**A Statistical Mechanics-Based Gradient-Enhanced Damage Model for Elastomeric Materials**

Technical Presentation: IMECE2023-119771

*Mulderrig Jason - Cornell University*

*Brandon Talamini - Lawrence Livermore National Laboratory*

*Nikolaos Bouklas - Cornell University*

**3:03PM**

**Structural Rigidity Analysis of Inflatable Wing Designs Constructed With High-Performance Fabric Membranes**

Technical Paper Publication: IMECE2023-112189

*Yuyang Song - Toyota Research Institute of North America,*

*Paul Cavallaro - Next Gen Structures & Technologies LLC*

*Ali Sadegh - The City College of City University of New York*

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## TECHNICAL SESSIONS

**12-20-01: FUNCTIONAL ORIGAMI AND KIRIGAMI-INSPIRED STRUCTURES AND METAMATERIALS**
10/31/2023
4:00PM–5:45PM – ROOM 278

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**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*

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**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*

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**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*

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**12-18-03: MECHANICS OF SOFT MATERIALS**
10/31/2023
4:00PM–5:45PM – ROOM 279

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**4:00PM**

**Thermomechanical Coupling in Monodomain and Polydomain Liquid Crystal Elastomers**

Technical Presentation: IMECE2023-113070

*Ruobing Bai - Northeastern University*

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## TECHNICAL SESSIONS

**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*

### 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**

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## TECHNICAL SESSIONS

**Cellular Solids Under Geometric Frustration: Animal Architecture and Bio-Inspired Designs**

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**

#### 2:00PM

**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*

#### 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*

### 12-16-01: MULTISCALE MODELS AND EXPERIMENTAL TECHNIQUES FOR COMPOSITE MATERIALS AND STRUCTURES COUNT
**11/1/2023**
**2:00PM–3:45PM – ROOM 288**

#### 2:00PM

**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*

#### 2:21PM

**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*

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## 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*

**12-12-01: NOVEL VERIFICATION, VALIDATION, AND UNCERTAINTY QUANTIFICATION (VVUQ) TECHNIQUES AND APPROACHES FOR ENERGY, BIOMEDICAL, AND ADVANCED MANUFACTURING APPLICATIONS**
**11/1/2023**
**4:00PM–5:45PM – ROOM 280**

**4:00PM**

**A Causal Approach to Model Validation and Calibration**

Technical Paper Publication: IMECE2023-112430

*Diego Mandelli - Idaho National Laboratory*

*Ronald Gonzales - Idaho National Laboratory*

*Congjian Wang - Idaho National Laboratory*

*Mohammad Abdo - Idaho National Laboratory*

*Zachary Welker - University of Michigan*

*Paolo Balestra - Idaho National Laboratory*

*Sunming Qin - Idaho National Laboratory*

*Victor Petrov - University of Michigan*

**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 Katsiroumba - 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 Sarigul-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*

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## 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 Unversity 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 Lacava - 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*

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## TECHNICAL SESSIONS

### 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*

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## 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*

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## 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*

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## TECHNICAL SESSIONS

**2:21PM**

**Dynamics of Transition Waves in Hierarchical Phase-Transforming Metamaterials: From 1D Chains to 2D Lattices**

Technical Presentation: IMECE2023-120094

*Chongan Wang - University of California, San Diego*

*Michael Frazier - University of California, San Diego*

**2:42PM**

**Magnetically Reconfigurable Conformal Metamaterials With Global Area-Preservation and Widely Tunable Physical Properties**

Technical Presentation: IMECE2023-120264

*Shuai Wu - Stanford University*

*Jay Sim - Stanford University*

*Jize Dai - Stanford University*

*Yilong Chang - Stanford University*

*Ruike Renee Zhao - Stanford University*

**3:03PM**

**Homoclinic Kink Solutions in Multi-Stable Metamaterials: Manipulating Transition Wave Paths and Breaking Reciprocity**

Technical Presentation: IMECE2023-120329

*Chongan Wang - University of California, San Diego*

*Michael Frazier - University of California, San Diego*

**3:24PM**

**A Simple Design Rule for Variable Thickness Shell Based Architected Materials With Improved Stiffness and Strength**

Technical Presentation: IMECE2023-120229

*Rimah Al Aridi - University of South Carolina*

*Fakhreddin Emami - University of South Carolina*

*Andrew Gross - University of South Carolina*

**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 Tsimpoukis - The University of Texas at Austin*

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## TECHNICAL SESSIONS

**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*

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**12-07-02: MECHANICAL METAMATERIALS**
**11/2/2023**
**4:00PM–5:45PM – ROOM 274**

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**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 Venusian 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*

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**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*

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**5:24PM**

**Line Waves in Elastic Metamaterials**

Technical Paper Publication: IMECE2023-112379

*Ankur Dwivedi - University of Exeter*

*S.A.R. Horsley - University of Exeter*

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## TECHNICAL SESSIONS

**12-08-01:** COMMITTEE ON COMPUTING IN APPLIED MECHANICS (CONCAM) DISTINGUISHED LECTURES ON COMPUTATIONAL MECHANICS
**11/2/2023**
**4:00PM–5:45PM – ROOM 275**

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**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*

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**4:55PM**

**Predictive Modeling for Cardiovascular Diseases: Where the Rubber Hits the Road. Part 1**

Technical Presentation: IMECE2023-119930

*Hoda Hatoum - Michigan Technological University*

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**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**

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**4:00PM**

**Modeling Traffic Jam and Growth Process of Neurons Using Isogeometric Analysis and Physics-Informed Neural Network: Part 1**

Technical Presentation: IMECE2023-119591

*Yongjie Jessica Zhang - Carnegie Mellon University*

---

**4:28PM**

**Modeling Traffic Jam and Growth Process of Neurons Using Isogeometric Analysis and Physics-Informed Neural Network: Part 2**

Technical Presentation: IMECE2023-119592

*Yongjie Jessica Zhang - Carnegie Mellon University*

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**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*

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**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*

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## 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*

### 4:21PM

**Shock Dynamics of Architected Materials**

Technical Presentation: IMECE2023-119861

*Shengzhi Luan - Johns Hopkins University*

*James Guest - Johns Hopkins University*

*Stavros Gaitanaros - Johns Hopkins University*

### 4:42PM

**Suppressing Instability in Thermally Drawn Semiconductor Fibers**

Technical Presentation: IMECE2023-120085

*Dong Li - Nanyang Technological University*

*Zhixun Wang - Nanyang Technological University*

*Huajian Gao - Nanyang Technological University*

*Lei Wei - Nanyang Technological University*

*Zhe Wang - Jilin University*

### 5:03PM

**Crushing of a Closed-Cell Polymeric Foam Under Triaxial Loading**

Technical Presentation: IMECE2023-119785

*Stelios Kyriakides - 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*

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## TECHNICAL SESSIONS

**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*

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

**Topics:**

13-1:   General Topics of MEMS/NEMS

13-2:   Design and Fabrication, Analysis, Processes, and Technology for Micro and Nano Devices and Systems

13-3:   Computational Studies on MEMS and Nanostructures

13-4:   Applications of Micro and Nano Systems in Medicine and Biology

13-5:   Micro and Nano Devices

13-6:   Applied Mechanics and Materials in Micro- and Nano-Systems

13-7:   Packaging Technology in Heterogeneous Integration Applications

13-8:   Energy Harvesting and Storage

13-9:   Advanced Manufacturing of Microsystems, Microstructures, and Miniaturized Actuators

13-10: Microfluidics 2023

13-11: Inertial Navigation: MEMS/NEMS to Bio-Inspired

13-12: MEMS based Electrochemical Sensors in Biomedical Applications

13-13: Simulations of Material Modeling and Behavior Analysis for MEMS Applications

### 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

Luis Fonseca, Universitat Autònoma de Barcelona

Mengkai Shih, National Formosa University

Mohammad Mehdi Salek, ETH Zurich

Mohammed Jalal Ahamed, University of Windsor

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

Xian Zhang, Stevens Institute of Technology

### 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-Hyouk Song, Texas State

Ioana Voiculescu, The City College of New York

Jeong Tae Ok, Shawnee State University

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## 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*

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## TECHNICAL SESSIONS

**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*

**13-06-01: APPLIED MECHANICS AND MATERIALS IN MICRO- AND NANO-SYSTEMS I**
**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*

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## TECHNICAL SESSIONS

**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*

**13-08-01:** ENERGY HARVESTING AND STORAGE & **13-09-01:** ADVANCED MANUFACTURING OF MICROSYSTEMS, MICROSTRUCTURES, AND MINIATURIZED ACTUATORS
10/30/2023
2:00PM–3:45PM – ROOM 277

**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*

# TECHNICAL SESSIONS

**13-06-02:** APPLIED MECHANICS AND MATERIALS IN MICRO-
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

*Corrisa 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:** MICROFLUIDICS 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*

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## TECHNICAL SESSIONS

**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

**13-04-01:** APPLICATIONS OF MICRO AND NANO SYSTEMS IN MEDICINE AND BIOLOGY I
10/31/2023
10:15AM–12:00PM – ROOM 280

**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*

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## TECHNICAL SESSIONS

**13-05-01: MICRO AND NANO DEVICES**
**10/31/2023**
**10:15AM–12:00PM – ROOM 288**

**WExtremely 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*

**11:39AM**

**Flexible Surface Acoustic Wave (SAW) Sensors for Cryogenic Sensing Application**

Technical Paper Publication: IMECE2023-113741

*Michael Kohler - New York Institute of Technology*

*Andy Zhang - New York Institute of Technology*

*Christopher Moore - New York Institute of Technology*

*Ioana Voiculescu - The City College of New York*

*Fang Li - New York Institute of Technology*

**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 Untaroiu - 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*

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## 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*

## TECHNICAL SESSIONS

**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 Universit*

*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*

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## TECHNICAL SESSIONS

### 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*

*John Jensen*

*John Wiechel*

*Mahmud Hasan*

*Maysam Kiani*

*Mostafa Hamza*

*Philipp Grimmeisen*

*Priyanka Pandit*

*Shweta Dabetar*

*Stephen Ekwaro-Osire, Texas Tech University*

*Tagir Fabarisov, University of Stuttgart*

*Tengfei Wang*

*Yalda Saadat*

*Yanfeng Shen, Shanghai Jiao Tong University*

### 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*

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## 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*

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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

**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

*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*

### 4:42PM

**Probabilistic Risk Assessment Approach for the Transportation of Micro Reactors: Evaluating the Impact of Highway Accidents on the Surrounding Population**

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*

## 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*

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**11:18AM**

**Construction of a Strain-Based Bayesian Network for Assessing Pipeline Risk due to Ground Movement**

Technical Paper Publication: IMECE2023-113465

*Colin Schell - University of Maryland, College Park*

*Ernest Lever - GTI Energy*

*Katrina Groth - University of Maryland, College Park*

**14-04-01: MACHINE LEARNING FOR SAFETY, RELIABILITY, AND MAINTENANCE**
**10/31/2023**
**2:00PM–3:45PM – ROOM 289**

**2:00PM**

**Machine Learning Based Search for Access Points in Anomaly Detection Model**

Technical Paper Publication: IMECE2023-113438

*Vishnu Gangadhara Naik - University of Stuttgart*

*Tagir Fabarisov - University of Stuttgart*

*Andrey Morozov - University of Stuttgart*

**2:21PM**

**Global Modeling: Scaling Up Machine Learning Models for Predictive Maintenance**

Technical Paper Publication: IMECE2023-112254

*Allyson Morgenthal - SparkCognition*

*Akhilesh Jain - SparkCognition*

*Michael Aman - SparkCognition*

*Kevin Gullikson - SparkCognition*

*Nkem Egboga - SparkCognition*

*Marcus Horton - SparkCognition*

**2:42PM**

**Application of Sparse Estimation for Best Estimate Plus Uncertainty Analysis of a Small Break LOCA in PWRs**

Technical Paper Publication: IMECE2023-111094

*Ikuo Kinoshita - Institute of Nuclear Safety System, Inc.*

**3:03PM**

**Towards the Development of Material-Systems Intelligence**

Technical Presentation: IMECE2023-119889

*Christopher Rudolf - U.S. Naval Research Laboratory*

**3:24PM**

**A Deep Learning-Based Method for Early Crack Diagnosis in Non-Standard Spur Gear Pairs**

Technical Paper Publication: IMECE2023-113777

*Onur Can Kalay - Bursa Uludag University*

*Fatih Karpat - Bursa Uludag University*

*Esin Karpat - Bursa Uludag University*

*Ahmet Emir Dirik - Bursa Uludag University*

*Stephen Ekwaro-Osire - Texas Tech University*

**14-06-01: DEVELOPMENTS IN DESIGN THEORY FOR COMPONENT AND SYSTEM SAFETY AND RELIABILITY**
**10/31/2023**
**4:00PM–5:45PM – ROOM 289**

**4:00PM**

**Uncertainty of Thermodynamic-Entropy-Based Reliability and Remaining Useful Life Predictions Under Variable Amplitude Fatigue**

Technical Paper Publication: IMECE2023-114109

*Lance R. Curtis - University of Maryland*

*Bilal M. Ayyub - University of Maryland*

**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*

*Xiandong Liu - Beihang University*

*Yizhuo Wang - Beihang University*

*Er Jiang - 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*
*Wenbin Yu, Purdue University*
*Marriner Merrill*
*Po-Hao Adam Huang*

## Track 17: Research Posters

*Track Organizer: Omid Askari, West Virginia University*
*Reuben Kraft, Penn State*

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# Track
# Posters

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## 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 Diverters

**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*

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## TRACK POSTERS

### U6. Soft Robotics – Application of Dielectric Elastomer Actuators for a Pump Design

**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*

### U9. Power Transmission Lines Vibration Analysis From Karman Vortex Shedding: A Case Study

**Undergraduate Expo: IMECE2023-114796**

*Axel Ibañez - Universidad Nacional de Asunción*

*Santiago Schaerer - Universidad Nacional de Asuncion*

*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 Asuncion*

*Jorge Kurita - Universidad Nacional de Asuncion*

### 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*

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## 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 Muhieitheen - 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 Giridhar - Hyderabad Institute of Technology and Management*

*Gajalajamgam Yuvaraj - Hyderabad Institute of Technology and Management*

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## TRACK POSTERS

### 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*

### U20. A Deep Learning Semantic Segmentation Approach to Investigate Organic Fouling on Thermal Bubble-Driven Micro-Pumps

**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 Alag - 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*

## TRACK POSTERS

### U24. Drag Force Analysis on South American River Fish: A Comparison Case Study

**Undergraduate Expo: IMECE2023-113759**

*Leila Jimenez - Universidad Nacional de Asuncion*

*Daniel Allo - 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 Darmouth*

*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*

### U29. Investigation of Pseudo Fiber Length Transformation in 3D Printed Thermoset Composites via Single Fiber Pull-Out Tests

**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*

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## TRACK POSTERS

### 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*

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## TRACK POSTERS

### 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*

### U40. Methods to Characterizing Thermal Properties of Microchip Packaging Materials: Quantitative Analysis of Niobium, Copper, Sapphire, and Silicon Nitride Using Cryogenic Cycling

**Undergraduate Expo: IMECE2023-113881**

*Sonya Smith - Howard University*

*Sadiyah 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 Asuncion*

*Enzo Benitez - Universidad Nacional de Asuncion*

*Mathias Ramirez - Universidad Nacional de Asuncion*

*Jorge Kurita - Universidad Nacional de Asuncion*

### 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 Asuncion*

*Jose Osorio - Universidad Nacional de Asuncion*

*Jose Lopez - Universidad Nacional de Asuncion*

*Matias Vanuno - Universidad Nacional de Asuncion*

*Arturo Machuca - Universidad Nacional de Asuncion*

*Francisco Baez - Universidad Nacional de Asuncion*

*Joel Irala - Universidad Nacional de Asuncion*

*Jorge Kurita - Universidad Nacional de Asuncion*

### U43. Analysis of Heat Transfer in a Hot Chamber of the Stirling Engine

**Undergraduate Expo: IMECE2023-113997**

*Jonathan Amarilla - Universidad Nacional de Asuncion*

*Jorge Kurita - Universidad Nacional de Asuncion*

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## TRACK POSTERS

## 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*

### N101. Ultra-Fast Micro-Actuation Using Thermal Bubble-Driven Micro-Pumps

**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*

## TRACK POSTERS

### N105. Reliability Characteristics of Metals/Low-K Interconnect After Post-Annealing

**NSF Poster Presentation: IMECE2023-119680**

*Rajib Chowdhury - University of Louisiana at Lafayette*

*Thomas 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 Arunmozhi - National Institute of Technology Tiruchirappalli*

*Manikanta Gudla - National Institute of Technology Tiruchirappalli*

### N107. Effects of Low-Temperature Heat Treatment on Mechanical and Thermophysical Properties of Cu-10Sn Alloy Fabricated Using Laser Powder Bed Fusion

**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*

### N109. Evaluation of the Interfacial Shear Strength and Self-Healing of a New IM7 Single Fiber Reinforced Multifunctional Vitrimer Composite

**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*

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## TRACK POSTERS

**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*

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## TRACK POSTERS

### 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*

### N127. Multiple Equilibrium States of a Curved-Sided Hexagram: Elastic Stability and State Transitions

**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*

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## TRACK POSTERS

### 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*

### N129. Additive Manufacturing of Advanced Flow Modifiers for Flow Boiling

**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 Electrospray 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*

*Debjyoti 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*

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## TRACK POSTERS

### N136. Effect of Heat Treatment on the Ultrasonic and Mechanical Response of Niti Shape Memory Alloys

**NSF Poster Presentation: IMECE2023-120441**

*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*

### N137. Acoustic Characterization of Damage in Multilayer Ceramic Capacitors

**NSF Poster Presentation: IMECE2023-120442**

*Haley N. Jones - Penn State University*

*Susan Trolier-Mckinstry - Penn State University*

*Andrea P. Argüelles - Penn State University*

### N138. Exploring Na+ and K+ Ion Storage Behavior of WS2 Nanosheet-Loaded SiOC Fiber Structures

**NSF Poster Presentation: IMECE2023-113937**

*Sonjoy Dey - Kansas State University*

*Gurpreet Singh - Kansas State University*

### N139. Development and Characterization of Designed Electrospun Nanofibers for Cardiovascular Application

**NSF Poster Presentation: IMECE2023-114025**

*Alexi Switz - Florida International University*

*Salman Jamal - Florida International University*

*Anamika Prasad - Florida International University*

### N140. Thermal Performance Evaluation of Parabolic Trough Collectors Integrated With a High Thermal Conductive Nanofluid

**NSF Poster Presentation: IMECE2023-114408**

*Michael Englert - University of Missouri-Kansas City*

*Sarvenaz Sobhansarbandi - University of Missouri-Kansas City*

### N141. Effect of Surface Curvature and Surface Tension on the Mechanics of Adhesion of Soft Materials

**NSF Poster Presentation: IMECE2023-116978**

*A. Derya Bakiler - The University of Texas at Austin*

*Berkin Dortdivanlioglu - The University of Texas at Austin*

### N142. Magnetic Tunnel Junction Molecular Spintronics Based Chemical Sensing Device

**NSF Poster Presentation: IMECE2023-117083**

*Pius Suh - University of The District of Columbia*

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## TRACK POSTERS

### 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*

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## TRACK POSTERS

### 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 Leafhopper to Camouflage and Display

**Poster Presentation: IMECE2023-120289**

*Zhuo Li - Carnegie Mellon University*

*Sheng Shen - Carnegie Mellon University*

*Hyeong Seok Yun - Carnegie Mellon University*

### R213. To Study the Performance of Coated Carbide, Ceramics and Cermet Inserts During the Dry Turning of En-19 Hardened Steel

**Poster Presentation: IMECE2023-112092**

*Surinder Singh - University of Applied Sciences, Bochum, Germany*

### R214. Custom Design for Exploration, Spatial, Geographical, and Tropical Ambience: Resource Sensitive and Calculative Mechanization

**Poster Presentation: IMECE2023-120290**

*Satya Prasad Paruchuru - VNRVJIET*

*Ramu Ratlavath - VNRVJIET*

### R215. Foresight Into the Minimum Disturbing Approach and the Tolerance: A Lead Towards the Super-Humans

**Poster Presentation: IMECE2023-120293**

*Satya Prasad Paruchuru - VNRVJIET*

*Manjula Sree Rayudu - VNRVJIET*

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## TRACK POSTERS

### 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*

### R219. Material Methods for the Biologically and Environmentally Worthy Applications: Resource Management and Strategic Methods

**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*

## TRACK POSTERS

### 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 Parana*

*Giovani Conrado Carlini - Pontifícia 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*

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## TRACK POSTERS

### 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*

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## TRACK POSTERS

**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*

**R243. Microwave Energy 3d Printing - Contactless Machining Process, Rapid Prototyping, Surface Finishing, and Material Science Based on Machine Learning Algorithm Simulation Models**

**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*

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## TRACK POSTERS

### 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 - VNRVJIET*

### 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*

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## TRACK POSTERS

### 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*

### R260. Influence of Geometry and Mass on the Heat Transfer Properties of a Casted Heat Sink

**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*

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## TRACK POSTERS

### 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*

### R264. Convective Heat Transfer Enhancement of Tio2/water Nanofluid in Internal Tube Flows

**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 Ikegami - 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 Olia - Wentworth Institute of Technology*

### R268. Creep Void Nucleation and Growth Simulation Under Multiaxial Stress for Modified 9Cr-1Mo Forging Steel

**Poster Presentation: IMECE2023-119214**

*Teppei 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*

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## TRACK POSTERS

### 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*

### R271. Design of Fully Automatic Drum Filling Machine in Chemical Manufacturing Processes

**Poster Presentation: IMECE2023-119402**

*Junsik Lee - Changshin Univeristy*

*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*

*Jee Suh - The University of Alabama*

*Celestia Morgan - The University of Alabama*

*Hyun Jin Kim - 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*

### R275. Healthcare Leadership Leveraging the Benefits and Mitigating the Risks of Artificial Intelligence: A State-of-the-Art Review

**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*

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## TRACK POSTERS

### 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*

### 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*

### 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*

### 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*

### 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*

### R282. Autonomously Self-Healable, Reconfigurable, and Stretchable Soft Microfluidics

**Poster Presentation: IMECE2023-119833**

*Mohammed Jalal 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 Haghnegahdar - ANSYS, Inc.*

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## TRACK POSTERS

### 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*

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## TRACK POSTERS

### 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*

### R294. Experimental Investigation of Flow Boiling Heat Transfer Through Interconnected Microchannel Heat Sink

**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*

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## TRACK POSTERS

### 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*

### R303. Self-Promoting Energy Storage in Balsa Wood-Converted Porous Carbon Coupled With Carbon Nanotubes

**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.*

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## TRACK POSTERS

**R305. Evaluation Methodology for the Modern-Manufacturing Challenges of Multiple Needs: A Dynamic Multi-Scale Characterization Approach**

**Poster Presentation: IMECE2023-120162**

*Satya Prasad Paruchuru - VNRVJIET*

**R306. Thermal Transport in Embedded Nanoparticle Composites: A Molecular Dynamics Study of the Optimal Size Distribution**

**Poster Presentation: IMECE2023-120164**

*Theodore Maranets - University of Nevada, Reno*

*Yan Wang - University of Nevada, Reno*

**R307. Review of the Customized Test Methods for the Biological-Materials: Conformity With the Laboratory Essentials**

**Poster Presentation: IMECE2023-120165**

*Satya Prasad Paruchuru - VNRVJIET*

*Tejaswi Chilukuri - VNRVJIET*

**R308. Multi-Functional Load Resistant Framework for the Unpredictably Worthy Applications: Manufacturing With Controlled Discontinuity Degree**

**Poster Presentation: IMECE2023-120170**

*Satya Prasad Paruchuru - VNRVJIET*

*Tapaswi Velamati - VNRVJIET*

**R309. A Construct for the Inter-Scientific Application and the Bioengineering-Structures: A Facilitating Means to Explore**

**Poster Presentation: IMECE2023-120186**

*Satya Prasad Paruchuru - VNRVJIET*

*Tejaswi Chilukuri - VNRVJIET*

**R310. Monitoring of Schedule Sensitive Industrial, Expedition, and Exploratory Systems: Perceptive Analysis, Evaluation, and Validation**

**Poster Presentation: IMECE2023-120199**

*Satya Prasad Paruchuru - VNRVJIET*

*Tapaswi Velamati - VNRVJIET*

**R311. Multibody Dynamics Analysis of Lightweight Manipulators for Automated Ropeway Structure Inspection**

**Poster Presentation: IMECE2023-111915**

*Geunsu Song - Hanbat National University*

*Kwangbok Shin - Hanbat National University*

**R312. A Preventive Maintenance System for an Emerging Novel Industry: Requisites for an Effective Implementation**

**Poster Presentation: IMECE2023-120205**

*Satya Prasad Paruchuru - VNRVJIET*

*Gagan Paruchuru - Sri Chaitanya Junior College, KPHB*

**R313. Evaluation Methodology for Novel, Biocompatible, Inhomogeneous, and Advanced Materials: A Contextual Fusion Approach**

**Poster Presentation: IMECE2023-120215**

*Satya Prasad Paruchuru - VNRVJIET*

*Meghana Nidadavolu - VNRVJIET*

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## TRACK POSTERS

**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

Zhuo 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

**R316. Essential Processes That Elevate Humans Into Super-Humans With Conduct: Life Systems as the Means**

**Poster Presentation: IMECE2023-120227**

Satya Prasad Paruchuru - VNRVJIET

**R317. Educational Methodology for the Purposeful Ideology of the Beneficiaries: The Means to Population Transformation**

Poster Presentation: IMECE2023-120232

Satya Prasad Paruchuru - VNRVJIET

Aruna Prabha Kolluri - VNRVJIET

Siva Kalyani Koneti - VNRVJIET

**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

**R319. Resource Conservation and Regenerative Process to Improve the Life: An Elementary Purification Purging Approach**

**Poster Presentation: IMECE2023-120243**

Satya Prasad Paruchuru - VNRVJIET

Nidhi Saxena - VNRVJIET

**R320. Measures for Achieving Ecological Balance in the Challenging Conditions: An Approach of Resource Conservation**

**Poster Presentation: IMECE2023-120250**

Satya Prasad Paruchuru - VNRVJIET

Siva Kalyani Koneti - VNRVJIET

Deepthi Jammula - VNRVJIET

**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

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## COMMITTEE MEETINGS

### CONVENTION CENTER – IMECE 2023

| DATE | LOCATION | MEETING TITLE | START TIME | END TIME | ROOM# |
|------|----------|---------------|------------|----------|-------|
| MONDAY | | | | | |
| Monday, October 30, 2023 | Convention Center | Committee of Past Presidents | 10:30 AM | 1:30 PM | Room 388 |
| Monday, October 30, 2023 | Convention Center | Ethics of AI and Machine Learning – Interactive Workshop Organized by the ASME Management Division | 10:30 AM | 12:00 PM | Room 389 |
| Monday, October 30, 2023 | Convention Center | Fluids Engineering Division Townhall Meeting | 1:00 PM | 2:00 PM | Room 397 |
| Monday, October 30, 2023 | Convention Center | Management Division Executive Committee Meeting | 1:00 PM | 2:30 PM | Room 384 |
| Monday, October 30, 2023 | Convention Center | Material Division Technical Committee on Materials for Biomimetic and Medical Applications Meeting | 3:00 PM | 4:00 PM | Room 383 |
| Monday, October 30, 2023 | Convention Center | JTSEA Editorial Meeting | 4:00 PM | 6:00 PM | Room 386 |
| Monday, October 30, 2023 | Convention Center | Women in ME and ASME | 5:00 PM | 7:00 PM | Room 396 |
| Monday, October 30, 2023 | Convention Center | Applied Mechanics Division - Fracture and Failure Mechanics Technical Committee | 4:00 PM | 5:00 PM | Room 391 |
| Monday, October 30, 2023 | Convention Center | CFD Technical Committee Meeting | 6:00 PM | 7:00 PM | Room 391 |
| Monday, October 30, 2023 | Convention Center | Biomedical and Biotechnology Track Organizers | 6:00 PM | 7:00 PM | Room 392 |
| Monday, October 30, 2023 | Convention Center | Material Division Technical Committee Meeting on Composites and Heterogeneous Materials | 6:00 PM | 7:00PM | Room 383 |
| Monday, October 30, 2023 | Convention Center | ASME Aerospace Division Reception | 6:00 PM | 7:00 PM | Rooms 398-399 |
| Monday, October 30, 2023 | Convention Center | HTD K-23 Diversity, Equity, and Inclusion Committee Meeting | 6:00 PM | 7:30 PM | Room 393 |
| Monday, October 30, 2023 | Convention Center | HTD K-6 Heat Transfer in Energy Systems Committee Meeting | 6:00 PM | 7:30 PM | Room 388 |
| Monday, October 30, 2023 | Convention Center | HTD K-12 Aerospace Heat Transfer Technical Committee Meeting | 6:00 PM | 7:30 PM | Room394 |
| Monday, October 30, 2023 | Convention Center | JHMT Editorial Meeting | 6:00 PM | 8:00 PM | Room 386 |

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## COMMITTEE MEETINGS

| DATE | LOCATION | MEETING TITLE | START TIME | END TIME | ROOM# |
|------|----------|---------------|------------|----------|-------|
| **MONDAY** | | | | | |
| Monday, October 30, 2023 | Convention Center | ASME MEMS Division Meeting | 6:00 PM | 7:30 PM | Room 389 |
| Monday, October 30, 2023 | Convention Center | ASME K-20 committee in Computational Heat Transfer | 6:00 PM | 8:00 PM | Room 390 |
| Monday, October 30, 2023 | Convention Center | ASME Structures and Materials TC meeting | 6:30 PM | 9:00 PM | Room 395 |
| Monday, October 30, 2023 | Convention Center | Materials Division Technical Committee Meeting on Advanced Materials for Energy | 7:00 PM | 8:00 PM | Room 397 |
| Monday, October 30, 2023 | Convention Center | Multiphase Flow Technical Committee Meeting | 7:00PM | 8:00 PM | Room 384 |
| Monday, October 30, 2023 | Convention Center | Fluid Measurement and Instrumentation Technical Committee Meeting | 8:00 PM | 9:00 PM | Room 384 |
| **TUESDAY** | | | | | |
| Tuesday, October 31, 2023 | Convention Center | Executive Committee of the Applied Mechanics Division | 9:00 AM | 12:00 PM | Room 383 |
| Tuesday, October 31, 2023 | Convention Center | Heat Transfer Division Awards Luncheon | 12:00 PM | 1:30 PM | Room 391-92 |
| Tuesday, October 31, 2023 | Convention Center | Award Meeting of the Applied Mechanics Division | 12:00 PM | 4:30 PM | Room 386 |
| Tuesday, October 31, 2023 | Convention Center | Technical Committee Meeting for "Mechanics of Soft Materials" | 1:00 PM | 2:00 PM | Room 384 |
| Tuesday, October 31, 2023 | Convention Center | Fluid Mechanics Technical Committee Meeting | 1:00 PM | 2:00 PM | Room 383 |
| Tuesday, October 31, 2023 | Convention Center | AMD Committee on Computing in Applied Mechanics (CONCAM) | 1:00 PM | 2:00 PM | Room 388 |
| Tuesday, October 31, 2023 | Convention Center | Fluids Engineering Division Honors & Awards Committee Meeting | 2:00 PM | 3:00 PM | Room 383 |
| Tuesday, October 31, 2023 | Convention Center | Advanced Energy Systems Division Lecture & Reception | 4:00 PM | 6:30 PM | Room 389 |
| Tuesday, October 31, 2023 | Convention Center | Materials Division Technical Committee Meeting on Electronic Materials | 4:30 PM | 5:30 PM | Room 384 |
| Tuesday, October 31, 2023 | Convention Center | ASME Nanotechnology Group Annual Meeting | 5:00 PM | 6:00 PM | Room 386 |

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## COMMITTEE MEETINGS

| DATE | LOCATION | MEETING TITLE | START TIME | END TIME | ROOM# |
|------|----------|---------------|------------|----------|-------|
| Tuesday, October 31, 2023 | Convention Center | Noise Control and Acoustics Division: General Committee Meeting | 7:30 PM | 8:30 PM | Room 398 |
| Tuesday, October 31, 2023 | Convention Center | Advanced Energy Systems Division Executive Committee Meeting | 8:00 PM | 9:00 PM | Room 388 |
| WEDNESDAY | | | | | |
| Wednesday, November 1, 2023 | Convention Center | Fluid Application and System Technical Committee Meeting | 1:00 PM | 2:00 PM | Room 383 |
| Wednesday, November 1, 2023 | Convention Center | Panel: Frontiers of Manufacturing: In-Process Nondestructive Evaluation | 2:00 PM | 6:00 PM | Room 388 |
| Wednesday, November 1, 2023 | Convention Center | Micro- Nano- Fluid Dynamics Technical Committee Meeting | 2:00PM | 3:00 PM | Room 383 |
| Wednesday, November 1, 2023 | Convention Center | Fluids Engineering Division Graduate Student Scholar Committee Meeting | 3:00PM | 4:00 PM | Room 383 |
| Wednesday, November 1, 2023 | Convention Center | Materials Division Awards Symposium and Reception | 3:00 PM | 6:00 PM | Room 395 |
| Wednesday, November 1, 2023 | Convention Center | AMD/MD Joint Technical Committee Meeting on Constitutive Equations | 4:00 PM | 5:00 PM | Room 384 |
| Wednesday, November 1, 2023 | Convention Center | Noise Control and Acoustics Division: Rayleigh Lecture | 4:00 PM | 5:30 PM | Room 389 |
| Wednesday, November 1, 2023 | Convention Center | VVUQ 20 Subcommittee on Verification, Validation, and Uncertainty Quantification in Computational Fluid Dynamics and Heat Transfer | 6:00 PM | 9:00 PM | Room 383 |
| Wednesday, November 1, 2023 | Convention Center | Material Division Technical Committee Meeting on Design of Engineering Materials | 6:00 PM | 7:30 PM | Room 384 |
| Wednesday, November 1, 2023 | Convention Center | HTD K-15 Transport Phenomena in Manufacturing and Material Processing Committee Meeting | 6:00 PM | 7:30 PM | Room 390 |
| Wednesday, November 1, 2023 | Convention Center | Fluids Engineering Division Advisory Committee Meeting | 6:00 PM | 7:00 PM | Room 394 |
| Wednesday, November 1, 2023 | Convention Center | HTD K-9 Nanoscale Thermal Transport Technical Committee Meeting | 6:00 PM | 7:30 PM | Room 396 |
| Wednesday, November 1, 2023 | Convention Center | NDPD Executive Committee Meeting | 6:00 PM | 8:00 PM | Room 393 |
| Wednesday, November 1, 2023 | Convention Center | Track 3 Advanced Manufacturing Meeting | 6:00 PM | 8:00 PM | Room 386 |
| Wednesday, November 1, 2023 | Convention Center | Fluids Engineering Division Executive Committee Meeting with Technical Committee Chairs | 7:00 PM | 8:00 PM | Room 394 |

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## COMMITTEE MEETINGS

| DATE | LOCATION | MEETING TITLE | START TIME | END TIME | ROOM# |
|------|----------|---------------|------------|----------|-------|
| Wednesday, November 1, 2023 | Convention Center | with Technical Committee Chairs | 7:00 PM | 8:00 PM | Room 394 |
| Wednesday, November 1, 2023 | Convention Center | Fluids Engineering Division Executive Committee Meeting | 8:00 PM | 9:00 PM | Room 394 |
| THURSDAY | | | | | |
| Thursday, November 2, 2023 | Convention Center | Materials Division Joint Executive Committee and Technical Committee Meeting (Open Meeting) | 10:30 AM | 12:00 PM | Room 388 |
| Thursday, November 2, 2023 | Convention Center | Industry at IMECE:  Benefits and Involvement | 10:30 AM | 11:30 AM | Room 389 |
| Thursday, November 2, 2023 | Convention Center | Noise Control and Acoustics Division: Executive Committee Meeting (Closed) | 12:30 PM | 2:00 PM | Room 388 |
| Thursday, November 2, 2023 | Convention Center | Materials Division Executive Committee Meeting (Closed Meeting) | 2:00 PM | 3:30 PM | Room 390 |

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## HILTON RIVERSIDE HOTEL – IMECE 2023 OCT 28 & 29

| DATE | LOCATION | MEETING TITLE | START TIME | END TIME | ROOM NAME |
|------|----------|---------------|------------|----------|-----------|
| Saturday, October 28, 2023 | Hilton | Registration | 7:00 AM | 5:00 PM | Jefferson Foyer, Third Fl. |
| Saturday, October 28, 2023 | Hilton | Technical Committee on Publications & Communications (TCPC) | 8:00 AM | 12:00 PM | Parish, Third Fl. |
| Saturday, October 28, 2023 | Hilton | TEC Sector Council Meeting | 9:00 AM | 5:00 PM | Durham, Third Fl. |
| Saturday, October 28, 2023 | Hilton | Joint Editors-in-Chief (EIC) / Technical Committee on Publications & Communications (TCPC) | 12:00 PM | 5:00 PM | Parish, Third Fl. |
| | | | | | |
| Sunday, October 29, 2023 | Hilton | Registration | 7:00 AM | 5:00PM | Jefferson Foyer, Third Fl. |
| Sunday, October 29, 2023 | Hilton | Board of Governors Meeting | 8:00 AM | 3:00 PM | Jefferson Ballroom, Third Fl. |
| Sunday, October 29, 2023 | Hilton | TEC Sector Council Meeting (CLOSED) | 9:00 AM | 12:30 PM | Durham, Third Fl. |
| Sunday, October 29, 2023 | Hilton | Journal Editor-in-Chief Workshop | 9:30 AM | 12:00 PM | Ascot/Newberry, Third Fl. |
| Sunday, October 29, 2023 | Hilton | Heat Transfer Division Executive Committee Meeting (Closed) | 12:30 PM | 2:30 PM | Ascot/Newberry, Third Fl. |
| Sunday, October 29, 2023 | Hilton | TEC Townhall Meeting (OPEN) | 1:00 PM | 3:00 PM | Durham, Third Fl. |
| Sunday, October 29, 2023 | Hilton | Heat Transfer Division Executive Committee Meeting (Open) | 3:00 PM | 5:00 PM | Ascot/Newberry, Third Fl. |
| Sunday, October 29, 2023 | Hilton | Fluids Engineering Division Executive Committee Meeting | 3:00PM | 4:00PM | Norwich, Third Fl. |
| Sunday, October 29, 2023 | Hilton | Fluids Engineering Division Executive Committee meeting with Technical Committee Chairs | 4:00PM | 5:00PM | Norwich, Third Fl. |
| Sunday, October 29, 2023 | Hilton | Business Meeting | 4:00 PM | 4:30 PM | Jefferson Ballroom, Third Fl. |
| | | | | | |
| Monday - Thursday | Hilton | ASME Information Desk | 6:30 AM | 11:00 AM | On first floor opposite the escalator |

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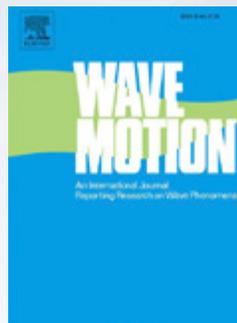
## EXHIBITORS

| Exhibitor | Booth # |
| --- | --- |
| ASME Louisiana Section | 421 |
| Blockpad | 422 |
| Cambridge University Press | 706 |
| Clemson University | 613 |
| Colorado School of Mines | 617 |
| Dassault Systems | 423 |
| Drexel University | 323 |
| George Mason University | 620 |
| MathWorks | 607 |
| More Than Engineering | 319 |
| New York University Tandon School of Engineering | 518 |
| North Carolina State University | 523 |
| PTC | 521 |
| Rochester Institute of Technology | 418 |
| TecQuipment, Ltd | 623 |
| Texas A&M University | 611 |
| The Ohio State University | 622 |
| The University of Tennessee – Oak Ridge Innovation Institute | 520 |
| University of the District of Columbia | 419 |
| University of Wisconsin – Platteville | 619 |
| USC Viterbi School of Engineering | 615 |
| Virginia Commonwealth University | 707 |
| Virginia Tech Mechanical Engineering | 522 |

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## FLOOR PLAN

| | |
|---|---|
| Drexel University 323 | Blockpad 422 |
| More Than Engineering 319 | Rochester Institute of Technology 418 |

| | |
|---|---|
| Dassault Systemes 423 | Virginia Tech Mechanical Engineering 522 |
| ASME Louisiana Section 421 | The University of Tennessee 520 |
| University of the District of Columbia 419 | New York University Tandon School of Engineering 518 |

| | |
|---|---|
| North Carolina State University 523 | The Ohio State University 622 |
| PTC 521 | George Mason University 620 |

TecQuipment, Ltd 623

Exhibitor Meeting Room 822

ASME Lounge 511

University of Wisconsin - Platteville 619

Colorado School of Mines 617

USC Viterbi School of Engineering 615

Clemson University 613

Texas A&M University 611

| | |
|---|---|
| MathWorks 607 | Cambridge University Press 706 |

Virginia Commonwealth University 707

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**www.asme.org**

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### 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.

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**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.

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**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.

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### 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.

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### 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.

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### 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!

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### 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.

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## SPONSORS

**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.

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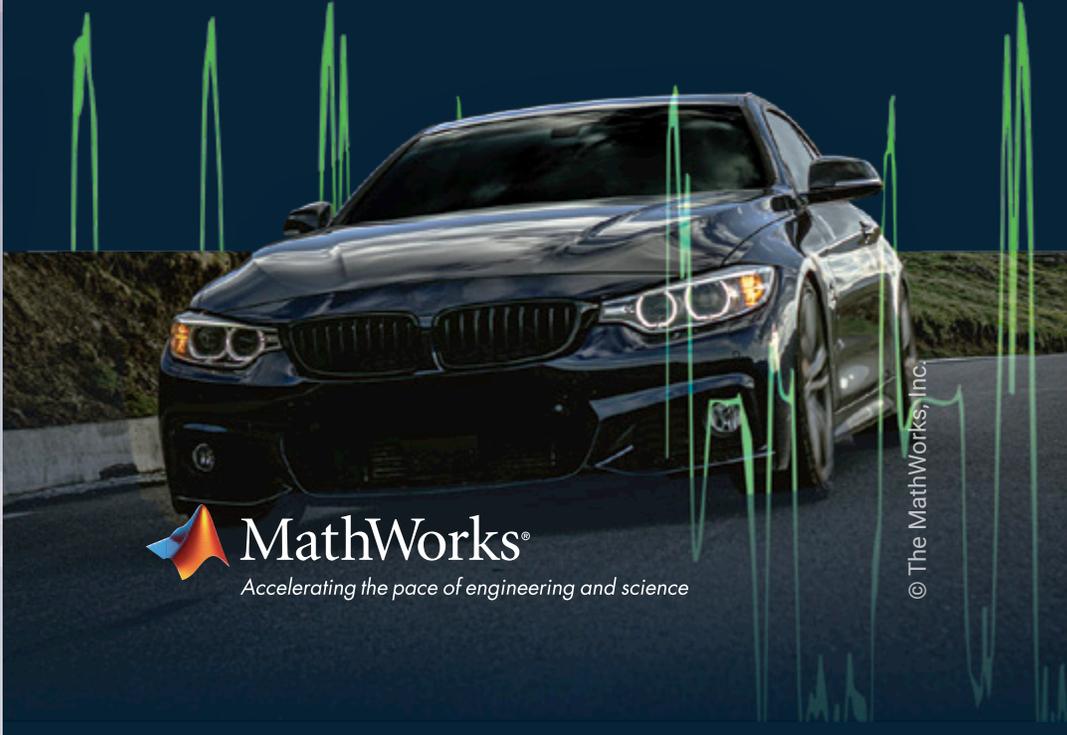
## 2024 Technical Conferences

### 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

**International Symposium on Flexible Automation (ISFA) 2024**
University of Washington
Seattle, WA
July 21–24, 2024
**Abstract deadline:** February 12, 2024
https://event.asme.org/ISFA

**SHTC/ES/FEDSM 2024**
Hilton Anaheim
Anaheim, CA
July 15-17
**Abstracts deadline:** November 6, 2024
https://event.asme.org/SHTC
https://event.asme.org/FEDSM
https://event.asme.org/ES

**International Design Engineering Technical Conferences & Computers and Information in Engineering Conference (IDETC.CIE) 2024**
JW Marriott Washington
Washington, DC
August 25–28, 2024
**Abstract deadline:** March 18, 2024
https://event.asme.org/IDETC-CIE

**International Pipeline Conference (IPC) 2024**
Calgary, AB, Canada
September 23 – 27, 2024
**Abstract deadline:** December 4, 2023
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

**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

### Register for these ASME conferences:

**Conference for Advanced Rector Deployment (CARD) 2024**
EPRI
Charlotte, NC
March 26-28, 2024
https://event.asme.org/CARD

**OMAE 2024 43rd International Conference on Ocean, Offshore & Arctic Engineering**
Singapore Expo
Singapore
June 9-14, 2024
https://event.asme.org/OMAE

**Turbo Expo 2024**
The ExCeL
London, England, United Kingdom
June 24-28, 2024
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

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