



IMECE[®]

ONE GREAT LEARNING EXPERIENCE.

INTERNATIONAL MECHANICAL ENGINEERING
CONGRESS AND EXPOSITION[®]

TECHNICAL
CONFERENCE
OCT 30 – NOV 3, 2022

Greater Columbus Convention Center,
Columbus, Ohio

2022 Program

<https://event.asme.org/IMECE>

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The American Society of Mechanical Engineers
ASME®





OFFICE OF THE MAYOR

Dear IMECE Attendees:

Welcome to Columbus! We couldn't be happier to have you here and to host the International Mechanical Engineering Congress and Exposition.

As you arrive in our city, ready to immerse yourself in industry knowledge and network with your peers, I think you'll feel right at home among the forward-thinking community here in Columbus. Our city is grounded in innovation and development, from the research being performed here to our thriving local makers scene.

You'll find that the Greater Columbus Convention Center is located in a dynamic, walkable area, offering dozens of restaurants, boutiques and entertainment options all within steps of your hotel room. You'll quickly see why *U.S. News & World Report* named Columbus one of the "Best Weekend Getaways in the Midwest" in 2021. Our city is home to a thriving and innovative culinary scene. In fact, over 100 restaurants can be found within just a mile or two of the convention center.

Across the street, you'll find our 145-year-old North Market, home to creative local vendors and culinary concepts. Just minutes away from the North Market is the Arena District, home to our three professional sports teams and their enthusiastic fans as well as many popular local sports bars. Nearby in the heart of Downtown, there are top-ranked museums, nationally renowned cultural arts centers, and historic performance venues.

We hope you enjoy your time in our city, and we look forward to hosting return visits where you can take on the experiences you don't get to this time around. Best wishes for a fulfilling and memorable visit – and welcome to Columbus!

Sincerely,

Andrew J. Ginther
Mayor



90 W. Broad Street | 2nd Floor | Columbus, OH 43215 | T (614) 645-7671 | F (614) 645-5818 | 311 @columbus.gov



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WELCOME FROM THE CHAIRS

**ASME 2022 International Mechanical Engineering
Congress and Exposition (IMECE),
October 30–November 3, 2022, Columbus, OH, USA**

Dear Distinguished Attendees:

Welcome to the ASME 2022 International Mechanical Engineering Congress and Exposition (IMECE) at Greater Columbus Convention Center, Columbus, Ohio. After two years of virtual meetings, we are very enthusiastic about a 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 2022 conference includes 17 Technical Tracks with over 1,600 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 grass-root effort forged by remarkable volunteer contributions and supported by a 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 2022 technical program will begin on Sunday, October 30, with the Opening Reception and Conference Exhibit at 5:30PM. Everybody is cordially invited to participate. Collocated with the reception we will host the Undergraduate Research and Design Expo that includes Student Design and Poster Competitions. 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 Jonathan Yaney, Founder and CEO of SpinLaunch. His talk will be on Doing the Impossible – Reengineering Space Launch. Our series concludes with the Closing Keynote (Thursday lunch) by Alba Colon, Director of Competition Systems & Technical Partnerships, Hendrick Motorsports. Her presentation will be on A Race to Victory. 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 more than 100 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 the ME Department Heads Forum, Congress-Wide Symposia, and the Applied Mechanics Dinner among others. Special events for 2022 include Roundtables and Panels on 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 Wednesday and Thursday and will include the NSF Panel on Dynamics, Control, and System Diagnostics; ASCE/ASME Joint Panel on Space Habitats; and a Panel on BioMedical Devices.

Tours at The Ohio State University are available on Sunday, Monday, Tuesday, and Thursday. They include state-of-the-art research labs in the Department of Mechanical and Aerospace Engineering, Transportation Research Center, Center for Automotive Research, Aerospace Research Center, Center for Design and Manufacturing Excellence, and Edison Welding Institute.

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 add Columbus, OH, as an IMECE host city. Since 2000, IMECE has been hosted in 19 different cities across the U.S. and Canada.

We are looking forward to meeting you all at the 2022 IMECE!

Sincerely,



Dumitru "Micky" Caruntu



TECHNICAL PROGRAM CHAIRS



Dumitru "Micky" Caruntu
Technical Program Chair
University of Texas
– Rio Grande Valley



Albert Ratner
Technical Program Vice Chair
University of Iowa



Marriner Merrill
General Conference Chair
U.S. Naval Research Laboratory



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



Christopher Depcik
Steering Committee Vice Chair
University of Kansas



Olesya I. Zhupanska
Steering Committee Senate Chair
University of Arizona



George Kardomateas
Steering Committee Senate Member
Georgia Institute of Technology



Aaron Knobloch
Steering Committee
Senate Member
GE Research



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



Reuben Kraft
Member at Large
Penn State University



Caglar Oskay
Member at Large
Vanderbilt University



Caterina Rizzi
Member at Large
Università degli Studi di Bergamo



Wenbin Yu
Member at Large
Purdue University



General Information



GENERAL INFORMATION

**ASME SWAPCARD APP**

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



ASME (Booth 411)
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 the Exhibit Hall D on the first floor of the Greater Columbus 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 B246 on the second floor of the Greater Columbus Convention Center is the Authors'/Speakers' Practice Room. The schedule is Monday–Thursday, October 30 – November 3, 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.



GENERAL INFORMATION

AUDIOVISUAL EQUIPMENT IN SESSION ROOMS

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

BADGES ARE REQUIRED FOR ADMISSION TO ALL ACTIVITIES

All conference attendees must wear their official IMECE 2022 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 business center in the convention center, however the hours of operation vary depending on the conferences in the building. There is a FedEx Office Print & Ship Center located at 180 N High Street, Columbus, OH 43215. Services include, but are not limited to, laser and color printing, document scanning, and ground/air shipping. For more information you can contact this location at (614) 621-1100.

Hours of Operation

Monday – Friday: 8:00AM – 7:00PM
 Saturday: 9:00AM – 6:00PM
 Sunday: 12:00PM – 6:00PM

COAT CHECK

There is a complimentary coat and bag check available at the Greater Columbus Convention Center, in room C150. Below are the dates and times it will be available:

Monday, October 31	7:30AM	–	6:15PM
Tuesday, November 1	7:30AM	–	5:45PM
Wednesday, November 2	7:30AM	–	6:15PM
Thursday, November 3	7:30AM	–	6:15PM

CONTINENTAL BREAKFAST

Continental breakfast will be served on Monday, October 31st through Thursday, November 3rd in Union Ballroom BC in the Greater Columbus Convention Center. Fully paid attendees are entitled to attend. The schedule is as follows:

Monday, October 31	7:30AM	–	8:00AM
Tuesday, November 1	7:30AM	–	8:00AM
Wednesday, November 2	7:30AM	–	8:30AM
Thursday, November 3	7:30AM	–	8:00AM *Foyer by Room C150

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 outside until the “All Clear” is given. The designated area to assemble outside the building is the lobby of the Hilton Columbus Downtown at 401 North High Street.



GENERAL INFORMATION



EXHIBITS INFORMATION

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

Sunday, October 30
5:30PM – 7:00PM

Monday, October 31
12:00PM – 5:00PM

Tuesday, November 1
12:00PM – 4:00PM

Wednesday, November 2
12:00PM – 4:00PM

CHILDCARE SERVICES

We are pleased to once again offer childcare reimbursement for attendees of IMECE 2022.

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 Columbus, OH. This offering will be available October 30 – November 3 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, 2022**.

If you have questions related to this benefit, please contact: [Stephanie Heinricks at heinrickss@asme.org](mailto:Stephanie.Heinricks@asme.org).

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

SOCIAL SITTERS

<https://www.socialsittersoh.com/>

Phone: (614)519-2390

LUNCH

Conference lunches will be served Monday–Wednesday, October 31–November 2, in Hall D of the Greater Columbus Convention Center. On Thursday, November 3, lunch is served in Union Ballroom BC. Fully paid attendees are entitled to attend. The schedule is as follows:

Monday, October 31	12:30PM – 1:30PM
Tuesday, November 1	12:00PM – 1:00PM
Wednesday, November 2	12:30PM – 1:30PM
Thursday, November 3	12:15PM – 12:45PM

MEETING INFORMATION

Main meeting information is located on the 1st floor of the Greater Columbus Convention Center. The operating hours are:

Sunday, October 30	10:00AM – 6:00PM
Monday, October 31	7:00AM – 6:00PM
Tuesday, November 1	7:00AM – 6:00PM
Wednesday, November 2	7:00AM – 6:00PM
Thursday, November 3	7:00AM – 5:45PM



GENERAL INFORMATION

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 Greater Columbus Convention Center has Mother's Room located in under the Battelle Grand Ballroom escalators. Please see a GCCC staff member or stop by Meeting Information if you need assistance locating the room.

OPENING RECEPTION

Exhibit Hall Grand Opening and Opening Reception

Sunday, October 30

5:30PM – 7:00PM

Hall D, Greater Columbus 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 30

5:30PM – 7:00PM

Hall D, Greater Columbus 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



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.



GENERAL INFORMATION

Wednesday, November 2
11:30AM–3:00PM
Hall D, Greater Columbus Convention Center

NSF Student Competition (Posters Only)**NSF Student Competition (Posters Only)**

Poster Setup	9:00AM	–	10:00AM
Judging	10:00AM	–	2:15PM
General Viewing:	12:00PM	–	4:00PM
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

PRAYER ROOM

Room B140 on the first floor of the Greater Columbus 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: IMECE2022 CONFERENCE PAPERS AND PROCEEDINGS

Technical papers accepted for publication for IMECE2022 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).

**SOCIAL MEDIA**

Let's be social! We encourage you to use the hashtag #IMECE2022 to tag your social media posts and photos throughout the conference.



GENERAL INFORMATION

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 Greater Columbus Convention Center. Free Wi-Fi access is also provided in the hotel rooms at the Hilton Hotel. To access the Wi-Fi in the convention center and the Marriott Hotel use these credentials.

REFRESHMENT BREAKS

Morning Break, Union BC Ballroom Foyer

Monday, October 31	10:30AM	–	10:45AM
Tuesday, November 1	10:00AM	–	10:15AM
Wednesday, November 2	10:30AM	–	10:45AM
Thursday, November 3	10:00AM	–	10:15AM *Foyer by Room C150

Afternoon Break, Exhibit Hall D unless otherwise noted

Monday, October 31	3:00PM	–	5:00PM
Tuesday, November 1	3:15PM	–	3:30PM
Wednesday, November 2	2:00PM	–	4:00PM
Thursday, November 3	3:45PM	–	4:00PM *Foyer by Room C150

REGISTRATION

Conference registration is located in the Union Ballroom Foyer on the first floor of the Greater Columbus Convention Center. The operating hours are:

Sunday, October 30	12:00PM	–	6:00PM
Monday, October 31	7:00AM	–	6:00PM
Tuesday, November 1	7:00AM	–	6:00PM
Wednesday, November 2	7:00AM	–	6:00PM
Thursday, November 3	7:00AM	–	5:45PM

**Greater Columbus
Convention Center
Network: IMECE
Password: imece2022**

**Hilton Columbus
Downtown
Network: IMECE
Password: imece2022**



GENERAL INFORMATION



PROFESSIONAL HEADSHOTS:

Be sure to stop by the exhibit hall during Monday to Wednesday during exhibit hours to have a complimentary headshot taken at the ASME booth.

Registration for committee meetings and special events is located on the third floor of the Hilton Columbus Downtown. The operating hours are:

Saturday, October 29	7:00AM	–	6:00PM
Sunday, October 30	7:00AM	–	6:00PM
Monday, October 31	7:00AM	–	6:00PM
Tuesday, November 1	7:00AM	–	6:00PM
Wednesday, November 2	7:00AM	–	6:00PM

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.

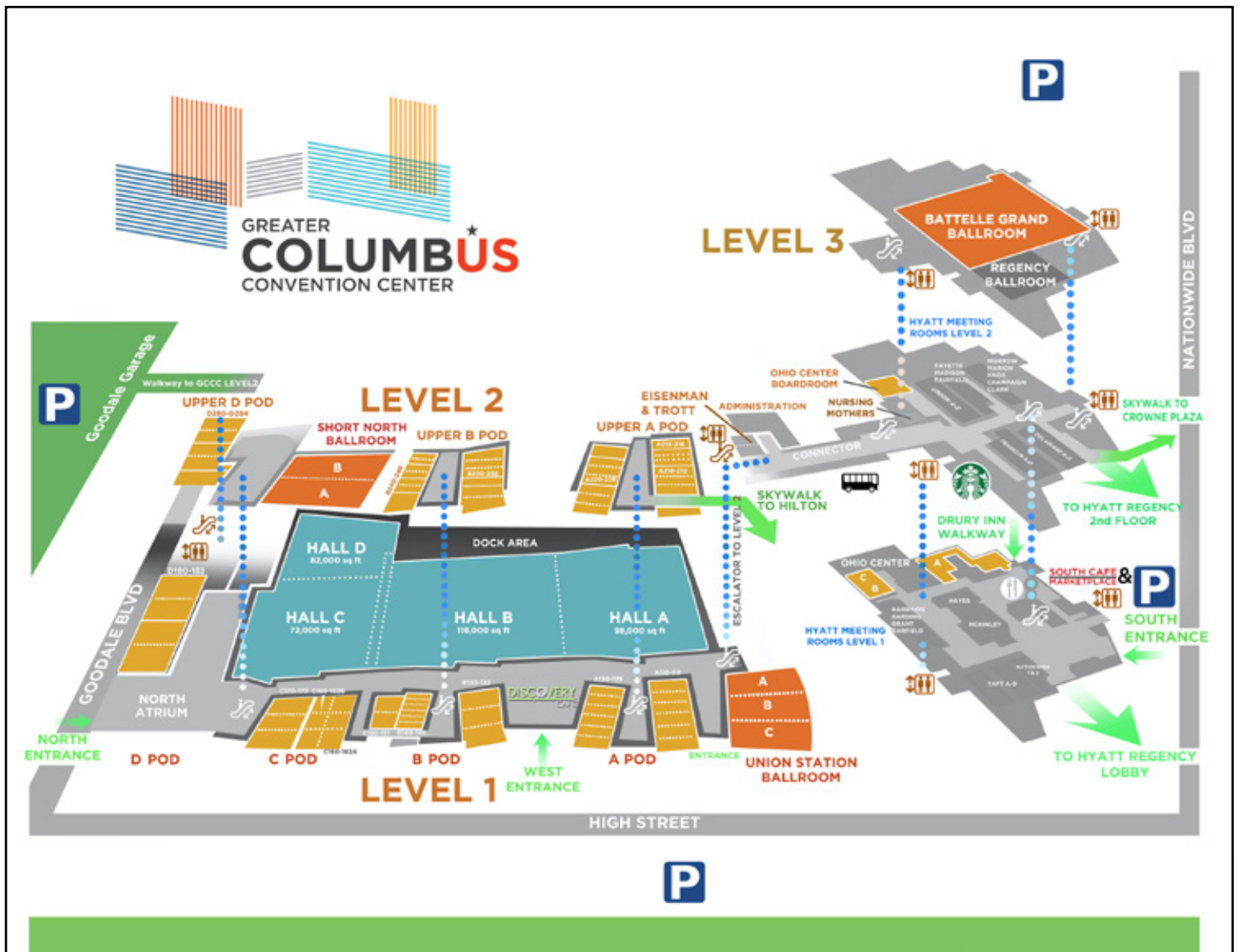
TICKET SALES

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.



GENERAL INFORMATION

Floor Plans



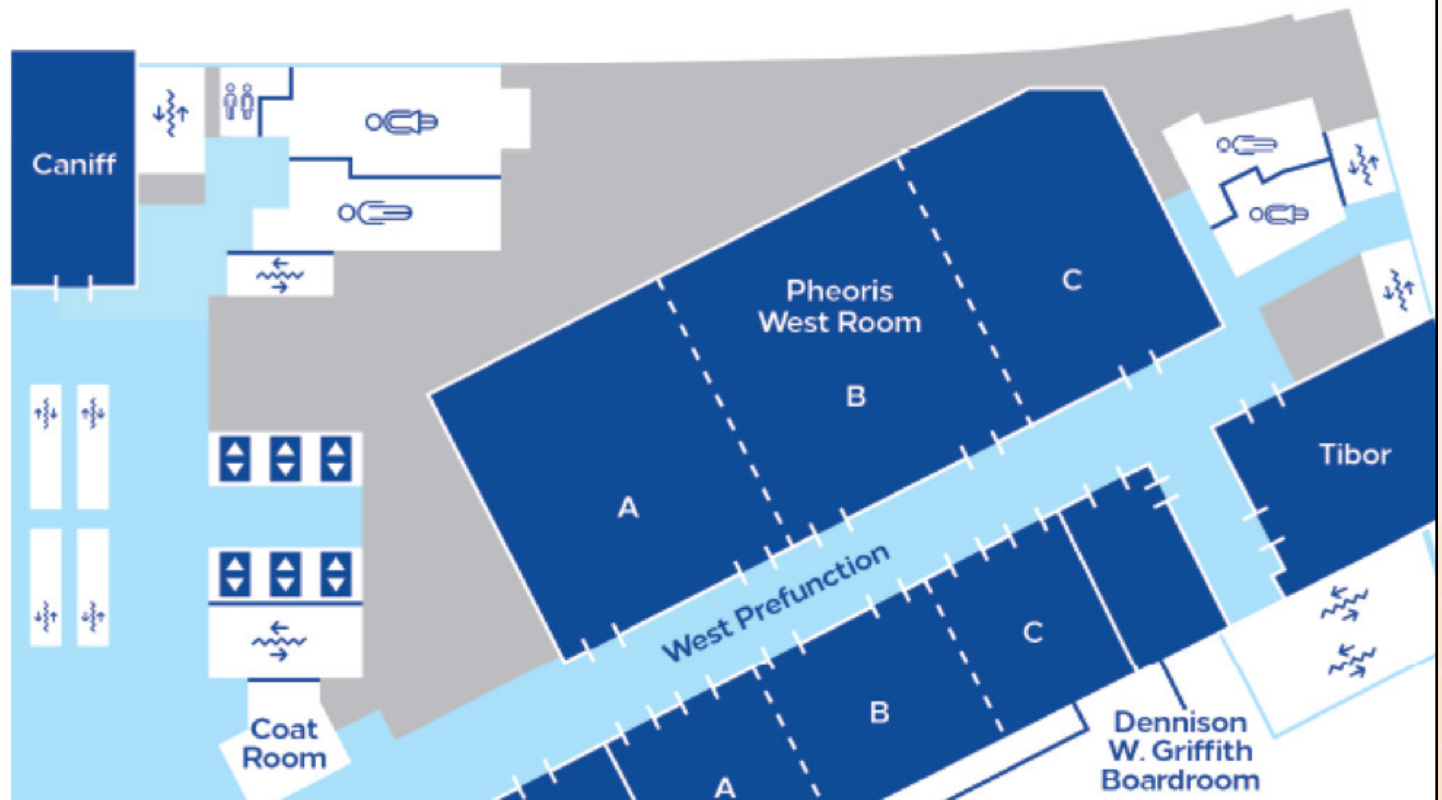
GENERAL INFORMATION

Floor Plans

402 - Third Floor

FLOOR MAP KEY

- Meeting/Conference Rooms
- Amenities
- Public Space
- Private Space



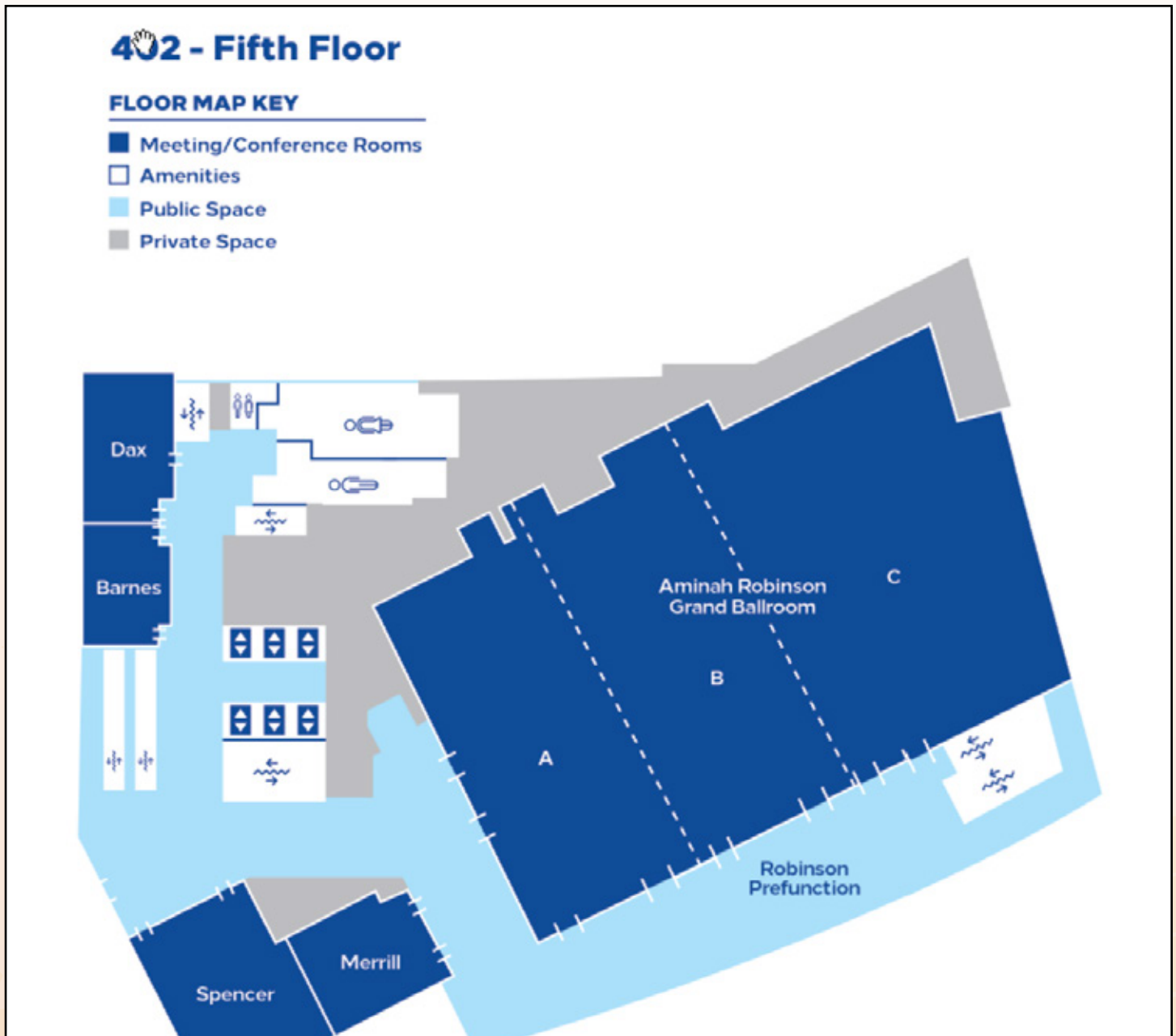
GENERAL INFORMATION

Floor Plans



GENERAL INFORMATION

Floor Plans



GENERAL INFORMATION

Technical Tours – **SOLD OUT**

Sunday, October 30, 2:30PM – 5:00PM

OSU MAE+ Research Lab Open House

Description: Tour participants will visit several of The Ohio State University's state-of-the-art research labs in the Department of Mechanical and Aerospace Engineering and other Engineering Departments. OSU researchers will give lab tours and present research demos to highlight how OSU is tackling a broad range of societal challenges across fields including robotics, bioengineering, manufacturing, energy, and nanotechnology.

Confirmed list of labs:

- Gear Lab
- Spine Research Institute
- Baker Systems Manufacturing Lab
- Nanoengineering & Biodesign Lab
- Microsystems for Mechanobiology & Medicine Lab
- Hoelzle Lab (robotics, controls, and additive manufacturing)
- Cyberbotics Lab
- Heremans Lab
(thermal transport and energy storage and conversion)
- And more!

Please plan to board the bus at 2:00PM. Tour will depart at 2:15PM and will arrive back to the Greater Columbus Convention Center at approximately 5:15PM. Bus will depart/drop off from the East Connector in the Greater Columbus Convention Center.



All tour buses leave FROM THE EAST CONNECTOR IN THE GREATER COLUMBUS CONVENTION CENTER. THERE WILL BE SIGNAGE AND STAFF TO DIRECT YOU.

GENERAL INFORMATION

Monday, October 31, 9:15AM – 12:00PM

Transportation Research Center

Description: Transportation Research Center Inc. is North America's most advanced, independent mobility testing and research organization, providing the world's leading transportation innovators with a full range of engineering and research expertise and a comprehensive array of transportation testing and evaluation facilities. TRC Inc.'s offerings include a 4,500-acre, full-service automotive proving ground and laboratory facility in East Liberty Ohio, which is home to the SMARTCenter, TRC Inc.'s automated and connected vehicle test facility.

Please plan to board the bus at 9:15AM. Tour will depart at 9:30AM and will arrive back to the Greater Columbus Convention Center at approximately 12:00PM. Bus will depart/drop off from the East Connector in the Greater Columbus Convention Center.

Tuesday, November 1, 1:30PM – 4:00PM

OSU Center for Automotive Research and Aerospace Research Center

Description: The Center for Automotive Research (CAR) is the preeminent research center in sustainable and safe mobility in the United States and an interdisciplinary research center in The Ohio State University's College of Engineering. With a concentration on preparing the next generation of automotive leaders, CAR is recognized for interdisciplinary emphasis on systems engineering, advanced and unique experimental facilities, collaboration on advanced product development projects with industry, and a balance of government and privately sponsored research. CAR's research focuses on energy, safety, and the environment and it offers state-of-the-art facilities for students, faculty, research staff, and industry partners.

Description: The Aerospace Research Center focuses the university's aerospace activities to optimize and connect core strengths and to address current and future air transportation challenges. We advance aerospace research by leading interdisciplinary investigation focused on aerospace technology while fostering outstanding graduate and undergraduate education. Our core research strengths are gas turbine engines, aerodynamic flow control, aeroacoustics, and unmanned aircraft systems (UAS).

Please plan to board the bus at 1:00PM. Tour will depart at 1:10PM and will arrive back to the Greater Columbus Convention Center at approximately 4:15PM. Bus will depart/drop off from the East Connector in the Greater Columbus Convention Center.



All tour buses leave FROM THE EAST CONNECTOR IN THE GREATER COLUMBUS CONVENTION CENTER. THERE WILL BE SIGNAGE AND STAFF TO DIRECT YOU.



GENERAL INFORMATION

Thursday, November 3, 9:00AM–11:30AM

Center for Design and Manufacturing Excellence and Edison Welding Institute



Description: CDME uses industry-funded product development projects as a vehicle to provide undergraduate student employees with hands-on, mentor-based experience integrating new technology into market-ready applications. In this model, our partners can leverage all the university’s technical assets to drive new technology into their products while simultaneously enhancing their brand among a pool of motivated students that are intimately familiar with the partner’s business, products, and processes. This newly evolved model of integrated product and student development is breaking down all existing paradigms for experience-based education and is impacting the way undergraduate students are prepared to enter the workforce – on a national scale.

All tour buses leave FROM THE EAST CONNECTOR IN THE GREATER COLUMBUS CONVENTION CENTER. THERE WILL BE SIGNAGE AND STAFF TO DIRECT YOU.

EWI empowers industry leaders to overcome complex manufacturing challenges and integrate new processes to bring products to market more quickly and efficiently. We provide comprehensive engineering services to help companies identify, develop, and implement the best options for their specific applications. With unmatched expertise, state-of-the-art lab facilities, and technology resources, we offer customized solutions that deliver game-changing results.

Please plan to board the bus at 8:30AM. Tour will depart at 8:40AM and will arrive back to the Greater Columbus Convention Center at approximately 11:45AM. Bus will depart/drop off from the East Connector in the Greater Columbus Convention Center.



GENERAL INFORMATION

ASME Landmark**ASME Landmark #228 Philo 6 Steam-Electric Generating Unit located at American Electric Power in Columbus, OH.**

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

Philo Unit 6 was the world's first supercritical-pressure steam-electric generating unit to operate commercially. The mechanical engineering innovations represented by Philo 6 significantly advanced the thermal efficiency of power generation, thereby greatly reducing its production cost. Its performance proved that introduction of higher steam pressure and higher steam temperature to power generation—combined with use of a double-reheat cycle—indeed could produce new levels of thermal efficiency, approaching 40 percent. At that time, the national average thermal efficiency of all fossil-fueled power plants was 29.9 percent. Experience gained from the engineering, design, construction, and operation of Philo 6 provided a firm engineering basis for many larger, efficient generating units that were to follow.

Both the feedwater inlet pressure of 5,500 pounds per square inch (psi) [37.9 mega Pascal (MPa)] and the turbine throttle pressure of 4,500 psi (31 MPa) constituted new “highs” in their respective classes and were almost double the steam pressure previously utilized for power production. The main steam temperature of 1,150 F (621 C) was 50 F (27.8 C) higher than economically achievable with then-existing technologies. The use of a double-reheat cycle [1,050 F (566 C) first reheat and 10,000 F (5338 C) second reheat] was a major innovation in the engineering of steam-electric power plants. The cyclone furnace design, integrated unit controls, feedwater chemical control, steam generator startup system, and feed-pump design were all uniquely developed for this pioneering unit.

The unit's steam generator, designed and built by Babcock & Wilcox, was rated at 675,000 pounds per hour (8 5 Kg per second) at 4,500 psi (31 MPa) and 1,150 F (621 C) with a feedwater temperature of 525 F (274 C). The unit's turbine-generator, designed and built by the General Electric Co., was a 3600-rpm, tandem-compound, double-flow turbine driving a 156,250 kva hydrogen-cooled generator.

The next supercritical-pressure unit to enter commercial service in the United States, after Philo 6, was Philadelphia Electric Company's Eddystone Unit 1 in February 1960.

Landmark Location
American Electric Power
1 Riverside Plaza
Columbus, OH 43215-2372
AEP: <http://www.aep.com>



Special Events

***Please see the conference app for the most up to date information*



SPECIAL EVENTS

SPECIAL EVENTS

SUNDAY, OCTOBER 30

IMECE First-Time Attendees Orientation
3:30PM–4:30PM
Room: C161AB
Greater Columbus 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.

ASME Business Meeting
Sunday, October 30, 2022
4:00PM–4:30AM
Roman Johnson, Third FI.
Hilton Columbus Downtown Hotel

Call to order by Karen Ohland,
 ASME President 2022-2023

Report by the Treasurer
 Membership Report
 2021-2022 Annual Report
 State of the Society Video
 Report on Proxies Received
 Ratification of Auditor
 Other Business

Exhibit Hall Grand Opening and Opening Reception
5:30PM–7:00PM
Halls D, 1st Level,
Greater Columbus 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.

International Undergraduate Research and Design Exposition
5:30PM–7:00PM
Halls D, 1st Level,
Greater Columbus Convention Center

Poster Setup: 2:30PM–3:30PM
 Expo (General Viewing): 5:30PM–7:00PM
 Winners Announced: 6:30PM–7:00PM

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.

MONDAY, OCTOBER 31

Keynote Event
8:00AM–9:15AM
(breakfast served from 7:30AM to 8:00AM)
Union Ballroom BC, 1st Level,
Greater Columbus Convention Center

Keynote Speakers:



SPECIAL EVENTS



Jonathan Yaney

*Founder & CEO
SpinLaunch*



Creon Levit

*Director of R&D
Planet Labs*

“Doing the Impossible – Reengineering Space Launch”

Everyone dreams about the great beyond - not everyone revolutionized how to get there. In this keynote session, Jonathan Yaney, Founder & CEO of SpinLaunch, shares his journey of how he conceptualized, and ultimately built, the world's first ground-based, electric-powered space launch system. What's the secret to delivering on this audacious goal? Mindset. Jonathan will share how the power of mission, grit, and the willingness to try anything is a key enabler to making far-off dreams become reality. Joining Jonathan on-stage is Creon Levit, Director of R&D at Planet Labs, who will share his own story of how innovation, iteration, and automation, along with low-cost electronics, is allowing Planet to launch earth observation satellites faster than any company or government in the world.

Presenter Biographies:

Jonathan Yaney founded SpinLaunch in 2014, with the mission to expand access to space by developing a radical new space launch system to dramatically lower costs and carbon emissions. During the last eight years, under the innovative vision and business acumen of Mr. Yaney, SpinLaunch has emerged as a fundamentally new type of kinetic launch system ready to transform the space industry and meet the growing demands of the small satellite market.

Mr. Yaney is a serial entrepreneur with 15 years' experience founding companies in SAAS, consulting, IT, and construction industries. He is a 1,000+ hour pilot and in 2019, was featured in WIRED Magazine as one of the 25 top innovators to watch. In 2022, SpinLaunch was named one of the top 100 most influential companies in the world by TIME Magazine.

Creon was employed as a scientist at NASA for over 30 years. He worked in applied physics, computational physics, aerodynamics, large data visualization, computational chemistry, parallel computing, celestial mechanics, launch systems, optics, and space systems engineering. Since 2015 he has been director of research and chief technologist at Planet Labs - a multinational satellite imaging company headquartered in San Francisco. Creon serves on several NASA committees and tech company advisory boards.

Plenary

9:45AM–10:30AM

Room: A214/A215

Greater Columbus Convention Center

Building SpinLaunch: An Inside Look at the Engineering

In this behind-the-scenes breakout session, SpinLaunch's Vice President of Technology, David Wrenn, will provide a technical review of SpinLaunch's kinetic launch technology that delivers substantially less expensive and more sustainable access to space. David will share a brief history of alternative rocket launch and provide a deep dive into the engineering implementation, including insights into the launch system's design, architecture, and satellite ruggedization.



SPECIAL EVENTS



David Wrenn

*Vice President of Technology
SpinLaunch*

Robert Henry Thurston Lecture*

Monday, October 31, 2022

10:00 AM - 11:00 AM

Pheoris West BC, Third Fl.

Hilton Hotel



Robert O. Ritchie

Materials Sciences Division, Lawrence Berkeley National Laboratory, and Department of Materials Science & Engineering, University of California Berkeley

Fracture Resistance in Biological and Engineering Materials

The ability of a material to undergo limited deformation is a critical aspect of conferring toughness as this enables the dissipation of high stresses which would otherwise cause fracture. Indeed, resistance to fracture is a compromise - a combination of two, often mutually exclusive, properties of strength and deformability. It can also be considered as a mutual competition between

intrinsic damage processes that operate ahead of a crack tip to promote its advance and extrinsic crack-tip shielding mechanisms that act at, or behind, the tip to locally diminish crack-tip stresses and strains. We examine here how such interplay is utilized to derive damage-tolerance in natural materials, e.g., bone skin, fish scales, and in engineering structural materials such as aerospace ceramic-matrix composites, nuclear graphite, and advanced metallic materials, such as high-entropy alloys.

Biography: Robert O. Ritchie is the H.T. & Jessie Chua Distinguished Professor of Engineering in the Materials Science & Engineering and Mechanical Engineering Departments at the University of California Berkeley. He is also Faculty Senior Scientist at the Lawrence Berkeley National Laboratory. He holds M.A., Ph.D. and Sc.D. degrees in physics/materials science from Cambridge University. Prof. Ritchie is known for his research on the fracture and fatigue of a broad range of engineering and biological materials, with current interests focused on the mechanical properties of natural materials and damage-tolerance in multiple-element metallic alloys. He is a Fellow/Foreign Member of the Royal Society and of the Royal Academy of Engineering in the U.K., and the U.S. National Academy of Engineering, the Russian Academy of Sciences and the Royal Swedish Academy of Engineering Sciences.

Biography: Robert O. Ritchie is the H.T. & Jessie Chua Distinguished Professor of Engineering in the Materials Science & Engineering and Mechanical Engineering Departments at the University of California Berkeley. He is also Faculty Senior Scientist at the Lawrence Berkeley National Laboratory. He holds M.A., Ph.D. and Sc.D. degrees in physics/materials science from Cambridge University. Prof. Ritchie is known for his research on the fracture and fatigue of a broad range of engineering and biological materials, with current interests focused on the mechanical properties of natural materials and damage-tolerance in multiple-element metallic alloys. He is a Fellow/Foreign Member of the Royal Society and of the Royal Academy of Engineering in the U.K., and the U.S. National Academy of Engineering, the Russian Academy of Sciences and the Royal Swedish Academy of Engineering Sciences.



SPECIAL EVENTS

**Material Division Centennial Celebration
Symposium – Materials Past, Present, and Future
(MD-CCS)**

Monday, October 31, 2022

4:00PM-6:30PM

Pheoris West BC, Third Fl.

Hilton Hotel

TUESDAY, NOVEMBER 1

Keynote

8:00AM–9:00AM

(breakfast served from 7:30AM to 8:00AM)

Union Ballroom BC,

Greater Columbus Convention Center



Vivek Lall, Ph.D.

Chief Executive

General Atomics Global Corporation

“Imagining the Future of Engineering”

Presenter Biography: Dr. Vivek Lall is Chief Executive of General Atomics Global Corporation based in San Diego, California since 2020.

Lall was appointed to the International Advisory Group of the US Chamber of Commerce in Washington DC in 2021. Lall also serves on the Board of Directors of US Japan Business Council and the Board of Directors of the US India Business Council in Washington DC. He also serves as Senior Advisor to the Center for Commerce and Diplomacy at the University of California San Diego as well as on the Board of the Center for Advancing Global Business at San Diego State University. In 2018, he was appointed by the United States Government in a key advisory role to the US Cabinet Secretary heading Department of Transportation (encompassing entities like the Federal Aviation Administration) in Washington DC which affects US and global aviation policies and technologies. Lall served as Vice President of Aeronautics Strategy and Business Development at Lockheed Martin based in Fort Worth, Texas. Lockheed Martin is the world’s largest defense company. Prior to that he has served as Chief Executive of U.S. and International Strategic Development at General Atomics Electromagnetic Systems. From 1996-2011, Vivek held numerous marketing and engineering leadership roles with The Boeing Company in Seattle including the Airplane Performance and Propulsion Group. He was appointed as Vice President and India Country Head, Boeing Defense Space & Security in May 2007. He also worked as an adjunct faculty member at Embry-Riddle, McConnell Air Force Base. He also served as the founding Co-Chair of the US – India Aviation Cooperation Program launched in 2005. Prior to Boeing he worked for Raytheon and conducted research with NASA Ames Research Center in various multidisciplinary engineering fields. Lall also was a special advisor to the United Nations in New York, a role in which he steered the multi-nation body frame policy and its implementation in the area of broadband and associated cyber security issues.

Lall earned a Bachelor of Mechanical Engineering degree from Carleton University in Canada and a Masters of Aeronautical Engineering degree from Embry-Riddle Aeronautical University in Florida. He also has his Ph.D. in Aerospace Engineering from Wichita State University in Kansas and his MBA from City University in Seattle. He has also completed management and executive courses at the American Management Association in Washington DC.



SPECIAL EVENTS

Lall was bestowed the Noble title of Sir for his lifelong outstanding achievements in July 2022. The Governor of Arkansas appointed him as an Ambassador of Arkansas in May 2022. Lall was honored by the Governor of Kentucky as a Kentucky Colonel in January 2022 which is the highest title of honor bestowed by the Commonwealth of Kentucky and is the most well-known honorary colonelcies conferred by United States governors. US Presidents George Bush, Jimmy Carter, Lynden Johnson, Ronald Reagan are some others that have been conferred this honor of Kentucky Colonel. Lall was also granted the Grand Cross by His Highness Mahmoud Salah Al Din Assaf from the Royal Order of Banu Assaf in January 2022.

Lall has been given the Lifetime Achievement Award in 2021 in the presence of the ruling family of the United Arab Emirates and princess Märtha Louise, daughter of King Harald and Queen Sonja of Norway at the Ritossa Family Summit which is the world's leading family office investment conference, where world leaders and elite family office investors unite together to invest and create a brighter future for the planet. Over 400 elite family offices, prominent conglomerate business owners, Sheikhs, royal families, private investment companies, sovereign wealth funds and industry professionals representing over USD4.5 trillion in investor wealth attended the event. He has also received the 2008 OCA National Asian Pacific American Corporate Achievement Award in the US. Cambridge (UK) has listed him as one of only 2000 Outstanding Scientists of the Twentieth Century. He has also been cited in Who's Who several times. He is in the Sigma Gamma Tau Aerospace Honor Society as well as the Pi Mu Epsilon Mathematics Honor Society. He was President of the Mathematical Association of America. He has authored over hundred articles in various journals. He was also trained as a private pilot at the Phoenix International Flight Training Center in Florida.

NSF Proposal Development Workshop

10:15AM–12:00PM

Room: A210/A211

Greater Columbus 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 towards early career and aspiring investigators at U.S. institutions seeking to understand the NSF merit review process, although the information provided will be valuable to principal investigators in any stage of their career seeking to learn more about proposal writing.

Heat Transfer Division Awards Luncheon

Sponsored by: Heat Transfer Division

Tuesday, November 1, 2022

12:00 PM - 1:30 PM

Pheoris West BC, Third Fl.

Hilton Columbus Downtown Hotel

Ticket: \$50

Heat Transfer Luncheon Awardees



Ashutosh Giri, Ph.D.

University of Rhode Island



SPECIAL EVENTS

BERGLES-ROHSENOW YOUNG INVESTIGATOR AWARD IN HEAT TRANSFER: For significant research contributions to heat transfer consisting of experimental and computational advancements in areas including interfacial thermal transport, electron-phonon coupling, and thermal conductivity engineering in nanomaterials



Srinath V. Ekkad, Ph.D.

North Carolina State University

GENERAL: For outstanding contributions to the field of heat transfer, particularly for promotion of community education and engagement through the co-authoring of a textbook, conference organization, and journal editing, and for pioneering applications of experimental methods in gas turbine heat transfer



Ravi Shankar Prasher, Ph.D.

Lawrence Berkeley National Laboratory

SCIENCE: For fundamental contributions to the science of heat transfer, phase transitions, and chemical reactions, and for engineering novel technologies for thermal management of electronic systems and decarbonize energy systems



Professor Kai Hong Luo Ph.D.

University College London

JAMES HARRY POTTER GOLD MEDAL: For exceptional achievements in advancing the science of nonequilibrium thermodynamics across nanoscales, mesoscales, and macroscales, as well as the development of cutting-edge and widely used physical and numerical models embodying thermodynamic principles that have transformed energy system prediction, design, and optimization.



Karen A. Thole, Ph.D.

The Pennsylvania State University

ART: For exemplary contributions in developing innovative cooling designs for various gas turbine components using metal additive manufacturing.

SPECIAL EVENTS

Materials Division Awards Event and Reception

Tuesday, November 1, 2022

3:00 pm - 6:30 pm

Gina Knee, Fourth Fl., Hilton Hotel

**Ankit Srivastava***Texas A&M University*

Sia Nemat-Nasser Early Career Award to Ankit Srivastava for innovative research on micro-mechanisms of deformation and failure of advanced structural materials, as well as enabling material design by combining fundamental theories, small-scale experiments and microstructural mechanics.

**George Volynadijs***Louisiana State University*

Nadai Medal for outstanding achievements in micro-mechanical characterization of plasticity and damage in materials, and for pioneering contributions to multiscale modeling and localization problems.

**Tsu-Wei Chou, Ph.D.***University of Delaware*

Honorary Member for pioneering and seminal research in functional composite materials for energy storage, electromagnetic wave interference shielding, and 4D-printing; as well as contributions to mechanical engineering education, mentoring, and sustained service to the international composite community.

Applied Mechanics Koiter Lecture

Tuesday, November 1, 2022

5:00PM–6:00PM

C162 AB, First Fl.

Columbus Convention Center

Greater Columbus Convention Center

**Vikram Deshpande***University of Cambridge*

SPECIAL EVENTS

Applied Mechanics Division Honors & Awards Banquet

Sponsored by: Applied Mechanics Division

Tuesday, November 1, 2022

6:00pm–9:00pm

Pheoris West BC, Third Fl.

Hilton Columbus Downtown Hotel

Tickets: \$75

The evening's events will include honoring and presenting the following AMD awards to:

Drucker Medal



Horacio Espinosa, Ph.D.

Northwestern University

Warner T. Koiter Medal



Vikram Deshpande

University of Cambridge

Timoshenko Medal



Michael A. Sutton, Ph.D.

University of South Carolina

Thomas K. Caughey Dynamics Award



Earl Dowell, Ph.D.

Duke University

ASME Medal



Katepalli Sreenivasan

New York University



SPECIAL EVENTS

Melville Medal



Glaucio H. Paulino, Ph.D.

Princeton University



Ke Liu, Ph.D.

Peking University



Tomohiro Tachi Ph.D.

University of Tokyo

**Advanced Energy Systems Division Lecture
& Reception**

Tuesday, November 1, 2022

5pm - 7pm

Charles Massey B, Third Fl.

Hilton Hotel

**Frank Kreith Energy Award
2022 Awardee**



Ranga Pitchumani, Ph.D.

Virginia Tech

2021 Awardee



Robert Pitz-Paal, Ph.D.

DLR Institute of Solar Research



SPECIAL EVENTS

**Edward F. Obert Award
2022 Awardees**



George-Rafael Domenikos, Ph.D.

National Technical University of Athens (NTUA)



Emmanuel Rogdakakis, Ph.D.

National Technical University of Athens (NTUA)



Irene Koronaki, Ph.D.

National Technical University of Athens (NTUA)

2021 Awardees

Jesse Watjen

Naval Nuclear Laboratory

Matthew T. Schifano

Naval Nuclear Laboratory

Mitra N. Sexton

LM-Knolls Atomic Power Lab

**Noise Control and Acoustics Division: Per Bruel
Gold Medal Award & NCAD Reception**

Tuesday, November 1, 2022

6:00PM - 7:30PM

Charles Massey A, Third Fl. Hilton Hotel

ME Department Heads Reception

Tuesday, November 1, 6:00-7:30 PM

This hybrid (in-person and virtual) meeting is planned for all ME/AEM department heads and chairs or their designees to have an informal meeting and reception to discuss different issues, announcements, and planned activities within MEDHEC. The reception timeframe would accommodate an NSF/NASA panel from 6:45-7:30 PM with the theme of innovation and entrepreneurship. This portion of the panel is for department heads but could be open to everyone. A dedicated portion of the panel from 7:30-8:30 PM is devoted for all MEDHEC Executive Committee members and MEDHEC members-at-large to discuss a number of important businesses



SPECIAL EVENTS

WEDNESDAY, NOVEMBER 2

NSF Networking Breakfast Roundtables

7:30AM-8:30AM

Union Ballroom BC

Greater Columbus Convention Center

This NSF-sponsored hot breakfast is open to all attendees, particularly minority and underrepresented groups, untenured faculty members, and close-to-graduation students. Network with your colleagues over common interests. There will be roundtables on the following topics:

Post Grad Careers in Industry

Post Grad Careers in Govt including Those with Disabilities

Post Grad Careers in an R1 University

Post Grad Academic Non-R1 Careers

Young Faculty Networking

Succeeding as a Minority in STEM

International Collaborations

Hot Topics in Aero Structures

Hot Topics in Acoustics and Vibrations

Hot Topics in Advanced Manufacturing

Hot Topics in Materials

Hot Topics in Biotech

Hot Topics in Systems and Design

Hot Topics in Dynamics and Control

Hot Topics in Energy

Hot Topics in Education

Hot Topics in Fluids

Hot Topics in Heat Transfer

Hot Topics in Mechanics of Structures

Hot Topics in Micro and Nano

Hot Topics in Safety and Reliability

Panel

8:30AM–9:30AM

Room: B230/B231

Greater Columbus Convention Center

New Trends in Medical Devices Technology

Medical diagnostics and therapies vary between pharmaceutical and physical depending on the nature of the disease. Medical Devices are gaining vast growth and developments. Non-invasive technology is still slowly progressing. Speed and accuracy are impeded by a critical confidentiality. From concept innovation and design to device manufacturing and commercialization is a battle surrounded by many threats. Going beyond fostering science and engineering to solve complex medical device challenges is held by the medical profession. Ways to extend collaborations with clinician may be the solution. How to find paths to close the gaps and get clinicians and engineers on one side of the table.



SPECIAL EVENTS



Ahmed Al-Jumaily, Ph.D.

*Auckland University of Technology
Moderator*



Thomas Royston, Ph.D.

*University of Illinois at Chicago
Panelist*



Philip V. Bayly, Ph.D.

*Washington University in St. Louis
Panelist*



Kendall R. Waters

*United Imaging
Panelist*



Reuben Kraft, Ph.D.

*Pennsylvania State University
Panelist*

Panel

8:30AM–9:30AM

Room: A210/A211

Greater Columbus Convention Center

Systems Engineering Requirements for Space Habitats

Presented by the ASME Space Technology Group for Exploration and Habitats, this panel will bring together leading experts from NASA and industry to discuss the vital system requirements that will underpin human habitation in space. Experts in space robotics as well as surface and orbital habitat will be on hand and in person to represent all the necessary perspectives. Attend and help determine a key ingredient of the next big leap in human exploration!



SPECIAL EVENTS



Assimina A. Pelegri, Ph.D.
*The State University of
New Jersey
Co-Organizer*



Eleanor Morgan
Lockheed Martin



Joseph R. Smith
*SC Solutions
Co-Organizer & Co-Moderator*



Al Tadros
Redwire Space, Panelist



Robert W. Moses, Ph.D.
*TAMER Space
Co-Moderator*



Larry Toups
*Emeritus at NASA Johnson
Space Center
University of Houston College of
Engineering, Panelist*



Morgan Gendel
*Founder
Planetary Shelter LLC
Panelist*



Nicklaus Traeden
*Project Engineer
Honeybee Robotics, Panelist*



SPECIAL EVENTS



Melodie Yashar

*ICON
Panelist*

**National Science Foundation
NSF (National Science Foundation) Track**

Track Chairs:

- Dr. Siddiq Qidwai, NSF
- Dr. Wenbin Yu, Purdue University
- Dr. Marriner Merrill, U.S. Naval Research Laboratory

In this forum, National Science Foundation (NSF) will provide various avenues for the IMECE community to interact with program directors from the Civil, Mechanical and Manufacturing Innovation (CMMI) Division and the Chemical, Bioengineering, Environmental, and Transport Systems (CBET) Division.

The track includes both NSF-sponsored workshops and 1-on-1 meetings as well as a student-centered IMECE-wide poster session for NSF-funded research.

NSF - CBET
8:30AM–9:15AM
Room: A226
Greater Columbus Convention Center



Shahab Shojaei-Zadeh

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 US Institutions.

NSF - Dynamics, Control, and System Diagnostics
8:30AM–9:30AM
Room: A216
Greater Columbus Convention Center



Harry Dankowicz



SPECIAL EVENTS

This presentation will introduce the NSF Dynamics, Control and Systems Diagnostics (DCSD) program and describe changes to its funding priorities that aim to promote the fundamental science and engineering of dynamic systems to advance solutions to urgent societal problems, while also broadening participation from investigators that are currently underrepresented in STEM and the institutions that serve them.

NSF - CMMI

9:45AM–10:30AM

Room: A212/A213

Greater Columbus Convention Center



Harry Dankowicz



Kathryn Jablokow



Siddiq Qidwai



Andrew Wells

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

One-on-One with NSF Program Directors- Pre-registration required

10:30AM–12:30PM (Session 1)

1:30PM–3:30PM (Session 2)

Greater Columbus Convention Center

Principal Investigators (PIs) will have an opportunity to discuss one-on-one their research proposals and concerns with program directors (PDs) of their choice. PDs representing the Advanced Manufacturing Program, the Mechanics & Engineering Materials Cluster programs, the Resilient and Sustainable Infrastructures Cluster programs, and the Transport Phenomena Cluster programs will be available.



SPECIAL EVENTS

The meeting time of 20 minutes demands that the Pls come prepared with their talking points.

2022 IMECE Feedback Session

10:00AM–11:00AM

Room: C161A

Greater Columbus Convention Center

NSF Student Competition (Posters Only)

Hall D

Greater Columbus Convention Center

Poster Setup	9:00AM	–	10:00AM
Judging	10:00AM	–	2:15PM
General Viewing:	12:00PM	–	4:00PM
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

2023 IMECE Track Organizers and Co-Organizers

Meeting

3:00PM–4:00PM

Room: C161A

Greater Columbus Convention Center

Noise Control and Acoustics Division: Rayleigh

Lecture*Wednesday, November 2, 2022

4:00PM - 5:45PM

C162A, First Fl.

Greater Columbus Convention Center



Marco Amabili

*Canada Research Chair
Professor, Department of
Mechanical Engineering
McGill University*

Professor Amabili holds the Canada Research Chair, Department of Mechanical Engineering, McGill University, Montreal, Canada. His exceptional research contributions span several areas of dynamics, solid mechanics and fluid-structure interaction. In particular, he is the author of over 500 scientific papers in vibrations and applied mechanics, 260 of which are published in prestigious refereed international journals, including the high-impact and multidisciplinary Nature Communications, Physical Review X and PNAS. In 2008 Amabili wrote the monograph “Nonlinear Vibrations and Stability of Shells and Plates” published by Cambridge University Press. For this book, he received the Worcester Reed Warner Medal of the ASME in 2020; this medal was established in 1930 to honor seminal contribution to the permanent literature in engineering. His second monograph, again for Cambridge University Press, appeared in 2018. Professor Amabili is the Contributing Editor of the International Journal of Non-linear Mechanics (Elsevier), Associate Editor of Journal of Fluids and Structures (Elsevier), and Co-Editor-in-Chief of International Journal of Mechanical System Dynamics (J. Wiley). Dr. Amabili is an elected Fellow of the Royal Society of Canada, Foreign Member of Academia Europaea, Member the European Academy of Sciences and Arts, Fellow of the Canadian Academy of Engineering, Member of the European Academy of Sciences and Fellow of the Engineering Institute of Canada. He received the prestigious 2021 Raymond D. Mindlin medal of the American Society of Civil Engineers (ASCE) and the 2021 Cataldo Agostinelli International Award of the “Lincoi” National Academy of Sciences of Italy. In 2022, he received the Guggenheim Fellowship in Engineering (Natural Sciences), and the Blaise Pascal Medal in Engineering of the European Academy of



SPECIAL EVENTS

Sciences. Amabili is one of the five members of the Executive Committee of Applied Mechanics Division of the ASME. Amabili is also the chair of the Canadian National Committee for IUTAM (International Union of Theoretical and Applied Mechanics) and he is the chair of the conference series ICoNSoM (Int. Conference on Nonlinear Solid Mechanics).

NONLINEAR DAMPING AND ACTIVE CONTROL IN VIBRATIONS: MODELLING AND EXPERIMENTS

An increase in damping is relevant for the passive control of vibrations and noise. Experimental data clearly shows a strong and nonlinear dependence of damping on the vibration amplitude for beams, plates and shells of different size and made of different materials. While the frequency shift of resonances due to geometric nonlinearity is commonly of 10 to 25 % at most for common structural elements, a damping value several times larger than the linear one should be expected for vibration of thin plates with a vibration amplitude about twice the plate thickness. This is a huge change. Therefore, the nonlinear nature of damping affects more structural vibrations than stiffness nonlinearity, even if it has not been sufficiently studied yet. A model of nonlinear damping is derived from viscoelasticity for single-degree-of-freedom systems and for rectangular plates. The damping model obtained is nonlinear and the parameters are identified from experiments. Numerical results are compared to experimental forced vibration responses for large-amplitude vibrations of different continuous structural elements, like beams, plates and shells, made of metal or composite materials. The second part of the talk addresses active vibration control of sandwich plates by using 4 PZT actuators and 4 sensors. A non-collocated MIMO PPF controller is used to significantly reduce the vibration of the first 8 modes without significant spillover into higher frequencies. The electro-mechanical coupling is experimentally identified in order to proceed with the optimization of the controller.

Fluids Engineering Division (FED) Awards Reception

Wednesday, November 2, 2022

6:00 PM - 7:30 PM

Charles Massey A, Third Fl. Hilton Hotel

ASME Aerospace Division Structures and Materials Reception

Wednesday, November 2, 2022

5:45 PM - 7:00 PM

Charles Massey A, Third Fl. Hilton Hotel

Spirit of St. Louis Medal



George A. Kardomateas, Ph.D.

Georgia Institute of Technology

SPECIAL EVENTS

THURSDAY, NOVEMBER 3

Panel
8:00AM–9:00AM
Room: A226
Greater Columbus Convention Center

Building Collaborations between R1 and HBCUs and Minority Serving Institutions

Dr. Constance Meadors will describe opportunities for both large and small institutions to benefit from NASA and NSF programs for Inclusion, Diversity, Equity, and Accessibility. In particular, she will highlight the NSF/ NASA Inclusion across the Nation of Communities of Learners of Underrepresented Discoverers in Engineering and Science (INCLUDES) and NASA EPSCoR Fellowships Advancing Science and Technology (FAST).



Albert Ratner
 University of Iowa
 Moderator



Adam Huang
 University of Arkansas,
 Fayetteville
 Panelist



Constance Meadors
 NASA Faculty Fellow and
 Minority Serving Institution
 STEM Engagement Liaison
 Panelist

Panel
8:00AM–9:00AM
Room: B230/B231
Greater Columbus Convention Center

Is There a Future for the Internal Combustion Engine?



Dr. Andrea Strzelec
 Moderator



Dr. Kelly Senecal
 Convergent Science
 Panelist



Brian West
 West Energy & Environment
 Associates
 Panelist



Michelle Dunlap
 Cummins Inc.
 Panelist

SPECIAL EVENTS



Jim Gamble
*VP-Engine and Fuel Cell Technologies, Wabtec
Panelist*



Dr. Wayne Huberty
*Mississippi State University
Panelist*

Panel
8:00AM–9:00AM
Room: A216
Greater Columbus Convention Center



Dr. Christopher Bounds
*Advanced Composites Institute
Panelist*

Academia/Industry Collaboration and Research Funding

There is always a gap between academic research topics and industry research interests. This panels serves as a platform to discuss these gaps, possible path for commercialization and industrialization of academic technologies and research funding opportunities.



Dr. Vish Vadari
*Drexel University
Panelist*



Ramakrishna Koganti
*UT Arlington and UT Dallas
Moderator*



Dr. Yousof Azizi
*Bridgestone Americas
Panelist*



SPECIAL EVENTS

Closing Keynote Lunch**12:15PM–1:45PM****(lunch served from 12:15PM to 12:45PM)****Union Ballroom BC,****Greater Columbus Convention Center****Alba Colón**

*Director of Competition Systems
& Technical Partnerships
Hendrick Motorsports*

Colón has received numerous honors for her pioneering work. In 2017, the Hispanic Heritage Foundation presented her with the STEM Award for contributions in science, technology, engineering and mathematics. She was honored as one of Business Insider's 23 Most Powerful Women Engineers in the World in 2015. In 2021, the American Society of Mechanical Engineers presented her the prestigious Kate Gleason Award.

Colón has a degree in Mechanical Engineering from the University of Puerto Rico, Mayaguez.

Hendrick Motorsports: Driving Performance Together

Alba Colon will provide an overview of Hendrick Motorsports highlighting the engineering work done at the race team and the everyday challenges encountered by her and her team. Learn what goes on behind the scenes of the most successful NASCAR Cup Series race team.

Presenter Biography: In January 2018, decorated auto racing engineer Alba Colón joined Hendrick Motorsports as director of competition systems. She works to enhance capabilities that directly support at-track competition with responsibility for critical areas including data analytics and communication technologies, database, team operations center among others.

Long regarded as one of the most influential women in NASCAR, Colón came to Hendrick Motorsports after a well-chronicled career with General Motors that spanned more than two decades.



Track Plenary Sessions

***Please see the conference app for the most up to date information*



TRACK PLENARY SESSIONS

Track 1: Acoustics, Vibration, and Phononics

Tuesday, November 1,

9:15AM–10:00AM

Room: A210/A211

Greater Columbus Convention Center

Passive Flow Control by Subsurface Phonon Motion

Dr. Mahmoud Hussein

University of Colorado Boulder

Abstract: Flow control is a many-decades old engineering problem of a multidisciplinary nature. It is concerned with devising passive or active means of intervention with the flow structure and its underlying mechanisms in a manner that causes desirable changes in the overall flow behavior. For streamlined bodies cruising through a flow, such as air or water, there is a key interest in the control of flow instabilities. These are disturbances or fluctuations in the flow velocity field that if left to grow are likely to trigger transition of the flow from laminar to turbulent, which in turn causes significant increases in skin-friction drag. A rise in drag reduces the fuel efficiency in aircraft and ships. It is therefore desired to devise intervention methods to impede the growth of these instabilities. Alternatively, in some scenarios, the objective may be to speed up the growth of the instabilities and laminar-to-turbulent transition to prevent or delay flow separation.

In recent research, we have shown that phonon motion underneath a surface interacting with a flow may be tuned to cause the flow to stabilize, or destabilize, as desired [Hussein et al., Proc. R. Soc. A, 2015]. The underlying control mechanism utilizes core concepts from crystal physics, primarily, the principle of destructive or constructive interferences and the notion of symmetry breaking. This is realized by installing a “phononic subsurface” (PSub), which is an architected structure placed in the subsurface region and configured to extend all the way such that its edge is exposed to the flow, forming an elastic fluid-structure interface. The PSub may take the form of a phononic crystal or an elastic metamaterial, with finite extent, and is typically

oriented perpendicular to the fluid-structure interface. It is engineered to exhibit specific frequency-dependent amplitude and phase response characteristics at the edge exposed to the flow. These two quantities represent the two core properties on which the PSub design theory is based. This approach represents an unprecedented capability to passively synchronize wave propagation across the interface of a structure and a flowing fluid, and achieve favorable, and predictable, alterations to the flow properties. In this seminar, the theory of phononic subsurfaces for passive flow control will be presented and its effectiveness demonstrated using coupled fluid-structure simulations in a channel flow with examples given comprising single or multiple PSubs for the control of single or multiple instabilities.

Bio: Mahmoud I. Hussein is the Alvah and Harriet Hovlid Professor at the Smead Department of Aerospace Engineering Sciences at the University of Colorado Boulder. He holds a courtesy faculty appointment in the Department of Physics and an affiliate faculty appointment in the Department of Applied Mathematics, and he serves as the Engineering Faculty Director for the Program of Exploratory Studies. He received a BS degree from the American University in Cairo (1994) and MS degrees from Imperial College, London (1995) and the University of Michigan—Ann Arbor (1999, 2002). In 2004, he received a PhD degree from the University of Michigan, after which he spent two years at the University of Cambridge as a postdoctoral research associate.

Dr. Hussein’s research focuses on the dynamics of materials and structures, especially phononic crystals and metamaterials, at both the continuum and atomistic scales. His research considers areas that range from vibrations and acoustics of engineering structures and passive flow control to lattice dynamics and thermal transport in semiconductor-based nanostructured materials. His studies are concerned with physical phenomena governing these systems, associated theoretical and computational treatments, and analysis of relevant phenomena such as dispersion, resonance, dissipation, and nonlinearity. His team also conducts experiments to support some aspects of the theoretical work.



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Dr. Hussein received a DARPA Young Faculty Award in 2011, an NSF CAREER award in 2013, and in 2017 was honored with a Provost's Faculty Achievement Award for Tenured Faculty at CU Boulder. He has co-edited a book titled, Dynamics of Lattice Materials, published by Wiley. He is a Fellow of ASME and has served as an associate editor for the ASME Journal of Vibration and Acoustics. In addition, he is the founding vice president of the International Phononics Society and has co-established the Phononics 20xx conference series which is widely viewed as the world's premier event in the emerging field of phononics.

Track 2: Advanced Manufacturing

Monday, October 31,

9:45AM–10:30AM

Room: A214/A215

Greater Columbus Convention Center

Next Generation Manufacturing for Advancing Circular Economy with Sustainable Products from Sustainable Manufacturing Processes

Dr. I.S. Jawahir

University of Kentucky

Abstract: Rapidly increasing global population with growing standard of living calls for a need for high quality manufactured products and services requiring significant product and process innovations. Circular Economy (CE) concepts are rapidly emerging globally due to the alarmingly increasing rate of environmental pollutions in waters, air, and soils that continue to impose significant economic burden with societal concerns on health effects, safety, and societal well-being in general. Traditionally known CE concepts heavily focus on recycling of end-of-life products and reuse of recovered materials targeting remanufacturing. Recently emerged comprehensive 6R-based (Reduce, Reuse, Recycle, Recover, Redesign, and Remanufacture) sustainable manufacturing principles demonstrate the far-reaching benefits with application potential across all levels of manufacturing (products, processes, and systems) to advance CE with product/process innovations for next generation manufacturing.

Metrics-based evaluation methods have been established for quantifying and improving the sustainability contents in manufactured products and manufacturing processes. During the last few decades, significant progress has been made in designing and developing innovative products and processes using sustainability principles aimed at economic, environmental, and societal benefits. However, the connectivity between product and process sustainability seems to have significant research gaps as the product designers do not adequately consider the need for utilizing sustainable manufacturing processes to produce the products. Similarly, manufacturing process planners generally do not consider the sustainability elements in products. Concurrent product and process design for sustainability by considering the entire life cycle (pre-manufacturing, manufacturing, use, and post-use stages) of the manufactured products would provide the necessary foundational strengths for products and processes. Next generation manufacturing will involve digitally integrated smart and sustainable manufacturing technologies, coupled with IIoT and data analytics for enhanced product/process quality, manufacturing productivity, and reduced manufacturing costs.

This presentation will focus on fundamental principles of sustainable manufacturing by showing the 6Rs as the key technological elements of Circular Economy. The presentation will demonstrate that in the era of Industry 4.0, digital technologies with IIoT can effectively be used to enable increased amount of life-cycle information available to product/process designers/developers and manufacturers using a sensor network that collects data across all stages of the product life cycle. This presentation will also show that this total life-cycle-oriented data can unlock the ability to use predictive analytics and modeling techniques beyond the initial life of the product, with multiple life cycles and for multi-generational products. Recent trends in sustainable manufacturing aimed at promoting and advancing Circular Economy with digitally integrated systems aimed at providing pathways for producing sustainable products from sustainable manufacturing will be summarized in this presentation.



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Bio: Dr. I.S. Jawahir is a Professor of Mechanical Engineering, James F. Hardyman Chair in Manufacturing Systems, and Founding Director of Institute for Sustainable Manufacturing at the University of Kentucky. His current research includes predictive modeling and optimization of sustainable manufacturing processes and sustainable product design. His early pioneering work on sustainable manufacturing processes (dry, near-dry (also known as MQL), and cryogenic machining/processing of materials) are well-recognized world-wide. He has published extensively with over 440 research publications, including 160+ journal papers; awarded with 4 U.S. patents; delivered 72 keynote papers at plenary sessions in major international conferences and over 150 invited presentations in 38 countries. He has received over \$55M in research funding from several federal agencies and numerous industry groups. He has also directed/supervised the research of 23 postdoctoral researchers, 45 PhD graduates, and over 65 MS (thesis) graduates. He is a Fellow of CIRP, ASME, and SME; Editor-in-Chief of International Journal of Sustainable Manufacturing; and Technical Editor of Journal of Machining Science and Technology. In 2005, he established the ASME's Research Committee on Sustainable Products and Processes and served as the Founding Chairman for six years (2005–2011). He has been active in international collaborative research through CIRP since 1990: led five CIRP research groups; founded the CIRP Conference Series on Modeling of Machining Operations in 1998; co-founded the CIRP Conference Series on Surface Integrity in 2012; continued to play a major role in the Global Conference on Sustainable Manufacturing (GCSM) series since its founding in 2004; and is currently leading the CIRP's IMPACT (Integrated Machining Performance for the Assessment of Cutting Tools) Cooperative Research Group (2021–2024).

Professor Jawahir received numerous awards and honors, including the 2013 ASME Milton C. Shaw Manufacturing Research Medal, 2015 William Johnson International Gold Medal, and the 2022 SME Frederick W. Taylor Research Medal.

Track 2: Advanced Manufacturing

Thursday, November 3,
9:15AM–10:00AM
Room: A210/A211

Greater Columbus Convention Center

Next Generation Digital Manufacturing Operations – Democratizing Advanced Manufacturing

Thomas R. Kurfess, Ph.D., P.E.
Georgia Institute of Technology

Abstract: The technological foundations of advanced manufacturing continue to rapidly evolve as ubiquitous sensing, cloud computing and storage, and next generation controllers are introduced into the manufacturing ecosystem. This talk presents some of the technical concepts and business models that will enable new technologies and capabilities in the manufacturing sector to be rapidly deployed throughout the U.S. industrial base. Insight will be presented into next generation resilient production operations and business models that favor local and point of assembly manufacturing. The talk will conclude with a discussion of how rapidly advancing technical innovations will be propagated throughout the manufacturing enterprise, ensuring a state-of-the-art manufacturing economy. This will provide opportunities for businesses of all sizes and democratize advanced manufacturing technologies throughout the United States.

Bio: Thomas R. Kurfess is the HUSCO/Ramirez Distinguished Chair in Fluid Power and Motion Control and Professor of Mechanical Engineering at Georgia Tech. During 2019–2021, he served as the Chief Manufacturing Officer and the Founding Director for the Manufacturing Science Division at Oak Ridge National Laboratory. During 2012–2013, he served as the Assistant Director for Advanced Manufacturing at the Office of Science and Technology Policy in the Executive Office of the President of the United States of America, where he was responsible for coordinating Federal advanced manufacturing R&D. He was President of SME in 2018 and



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currently serves on the Board of Governors of the ASME. His research focuses on the design and development of advanced manufacturing systems targeting secure digital manufacturing, additive and subtractive processes, and large-scale production enterprises. He is a member of the National Academy of Engineering and is a Fellow of ASME, AAAS, and SME.

Track 3: Advanced Materials: Design, Processing, Characterization and Applications

Tuesday, November 1,

9:15AM–10:00AM

Room: A212/A213

Greater Columbus Convention Center

Materials by Design: Three-Dimensional (3D) Nano-Architected Meta-Materials

Julia Greer

California Institute of Technology

Abstract: Creation of extremely strong and simultaneously ultra lightweight materials can be achieved by incorporating architecture into material design. Dominant properties of such meta-materials are driven by their multi-scale nature: from characteristic microstructure (atoms) to individual constituents (nanometers) to structural components (microns) to overall architectures (millimeters+). To harness the beneficial properties of 3D nano-architected meta-materials, it is critical to assess their properties at each relevant scale while capturing overall structural complexity.

Our research is focused on design, synthesis, and characterization of nano-architected materials using nanofabrication and additive manufacturing (AM) techniques, as well as on investigating their stimulus-driven response as a function of architecture, constituent materials, and microstructure. These “meta-materials” exhibit superior and often tunable properties, i.e., resilience against impact, recoverability, failure

suppression, anisotropic stiffness; nano-phonic response (PhCs); new electrochemical degrees of freedom (Li-ion batteries), and shape memory response (SMPs) at extremely low mass densities, as well as lend themselves to novel functionalities (hydrogel-enabled synthesis) which renders them useful and enabling in technological applications. We strive to uncover the synergy between atomic-level microstructure and nano-sized external dimensionality, where competing material- and structure-induced size effects drive overall response. My talk will focus on additive manufacturing via function-containing chemical synthesis to create nano- and micro-architected metals, ceramics, multifunctional metal oxides, and shape memory polymers, as well as demonstrate their potential in some real-use applications. I will describe how the choice of architecture, material, and external stimulus can elicit stimulus-responsive, reconfigurable, and multifunctional response.

Bio: Julia Greer’s research focuses on creating and characterizing classes of materials with multi-scale microstructural hierarchy, which combine three-dimensional (3D) architectures with nanoscale-induced material properties. We develop fabrication and syntheses of micro- and nano-architected materials using 3D lithography, nanofabrication, and additive manufacturing (AM) techniques, and investigate – among others – their mechanical, biochemical, electrochemical, electromechanical, and thermal properties as a function of architecture, constituent materials, and microstructural detail. We strive to uncover the synergy between the internal atomic-level microstructure and the nano-sized external dimensionality, where competing material- and structure-induced size effects drive overall response and govern these properties.

Greer obtained her B.S. in Chemical Engineering from MIT in 1997 and a Ph.D. in Materials Science from Stanford. She currently is a Ruben F. and Donna Mettler Professor of Materials Science, Mechanics, and Medical Engineering at Caltech. Greer is also the Director of the Kavli Nanoscience Institute at Caltech.



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Greer has more than 150 publications, has an h-index of 65, and has delivered over 100 invited lectures, which include 2 TEDx talks, the Gilbreth Lecture at the NAE, the Midwest Mechanics Lecture series, and a “IdeasLab” at the World Economic Forum, and was recently selected as Alexander M. Cruickshank (AMC) Lecturer at the Gordon Research Conferences (2020). She received the inaugural AAAM-Heeger Award (2019) and was named a Vannevar-Bush Faculty Fellow by the U.S. Department of Defense (2016) and CNN’s 20/20 Visionary (2016). Her work was recognized among Top-10 Breakthrough Technologies by MIT’s Technology Review (2015).

Track 3: Advanced Materials: Design, Processing, Characterization and Applications

Wednesday, November 2,

9:45AM-10:30AM

Room: A212/A213

Greater Columbus Convention Center

Materials Data and Informatics: Curation, Frameworks, Access, and Potential for Discovery and Design

L. Cate Brinson

Duke University

Abstract: With the advent of the materials genome initiative (MGI) in the United States and a similar focus on materials data around the world, numerous materials data resources and associated vocabularies, tools, and repositories have been developed. While the majority of these systems focus on slices of computational data with an emphasis on crystallographic materials, platforms for organic materials and their composites, especially those incorporating experimental data, have been quite limited. We will discuss the unique aspects of tackling data assembly and informatics associated with experimental organic materials data, with focus on our experiences creating an open-source data resource, NanoMine, part of MaterialsMine. Our goal has been to curate, annotate and store widely varying experimental data on polymer

nanocomposites (polymers doped with nanofiller) and providing access to characterization and analysis tools with the long-term objective of promoting facile nanocomposite design. The challenges and promises associated with data curation, ontology and vocabulary development, standardization and interoperability, and data visualization and analysis tools will be discussed. Several case studies will be presented, including use of natural language processing for archival data curation, coupling of experimental and computational data for materials design, and development of machine learning tools for rapid property screening and inference. Overall, we focus on the promise of this new approach to tackle materials design principles for the complex, high dimensional problems inherent in the multi-phase polymer space.

Bio: L. Cate Brinson is the Sharon C and Harold L Yoh III Professor of Engineering and the Donald M Alstalt Department Chair of the Mechanical Engineering and Materials Science Department at Duke University. Following her PhD from Caltech and a postdoc in Germany, she was a faculty member at Northwestern University until her move in 2017 to Duke University. Current research involves characterization of local polymer mechanical behavior (including composites and 3D printed constructs) and materials genome (data) research, where investigations span the range of molecular interactions, micromechanics and macroscale behavior. Dr. Brinson has received a number of awards, including the the Eringen Medal of SES, the Nadai Medal of the ASME, the Friedrich Wilhelm Bessel Prize of the Alexander von Humboldt Foundation, the ASME Tom JR Hughes Young Investigator Award, and an NSF CAREER Award, and she is a Fellow of many professional societies. She has authored one book and over 170 refereed journal publications with over 25,000 citations and an h-index of 70. Her book has had over 60,000 chapter downloads from the e-version since publication in 2008 and a second edition published in 2015. She served 5 years on the Society of Engineering Science Board of Directors, including one year as President, and is a founding member of the Materials Research Data Alliance (MaRDA).



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Track 4: Advances in Aerospace Technology

Wednesday, November 2,
9:45AM–10:30AM

Room: A214/A215

Greater Columbus Convention Center

Modeling and Manipulation of Wall-Bounded Turbulent Flows: From the Laboratory to High Reynolds Numbers

Beverley J. McKeon

California Institute of Technology

Abstract: Questions remain about the structure of wall turbulence, its sensitivity to perturbation (most practically with regards to natural or synthetic modification of the wall boundary condition via degradation or for control or manipulation purposes) and methods to design global flow characteristics. While the power of computation has grown dramatically in recent times, many of these issues are both unresolved and especially important at the Reynolds numbers of relevance to large scale, high Reynolds number naval, aeronautical and industrial flows. In this talk, we consider the canonical wall flows and utilize a combination of theory and (resolvent) analysis of the governing equations, simulation and experiments to give insight into some of the fundamental mechanisms governing flow response to wall modification and their relevance to high Reynolds number flow. The work has benefited from funding by ONR and AFOSR over a period of years, which is gratefully acknowledged.

Bio: Beverley McKeon is Theodore von Karman Professor of Aeronautics at the Graduate Aerospace Laboratories at Caltech (GALCIT) and Deputy Chair of the Division of Engineering & Applied Science. She received an M.Eng. degree from the University of Cambridge, and an M.A. and Ph.D. (2003) from Princeton University. Her research interests include interdisciplinary approaches to manipulation of boundary layer flows using morphing surfaces, fundamental investigations of wall turbulence at high Reynolds number, the development of resolvent analysis for modeling turbulent flows, and assimilation of experimental data for efficient low-order flow modeling. She was the recipient of a Vannevar Bush Faculty Fellowship from the DoD in 2017, the Presidential Early

Career Award (PECASE) in 2009, and an NSF CAREER Award in 2008, and is a Fellow of the APS and the AIAA. She currently serves as co-Lead Editor of Physical Review Fluids and on the editorial board of the Annual Review of Fluid Mechanics, and is a past editor-in-chief of Experimental Thermal and Fluid Science. She is the current Chair, and APS representative, of the U.S. National Committee on Theoretical and Applied Mechanics.

Track 4: Advances in Aerospace Technology

Thursday, November 3,

9:15AM–10:00AM

Room: A214/A215

Greater Columbus Convention Center

Advances in Aeroelasticity and Structural Dynamics at Gulfstream Aerospace

Paul Taylor

Gulfstream Aerospace Corporation

Abstract: In the ultra-competitive world of business aviation, the boundaries for speed and efficiency are continually being pushed. This requires more accurate methods, backed by reliable testing as well as more efficiency in certification testing. My talk will focus on several initiatives undertaken at Gulfstream which have advanced the state of the art in high speed aeroelastic wind tunnel testing and efficient flight flutter testing techniques, leading to higher quality clearance data provided on an efficient time scale, while still maintaining the highest safety standards.

Bio: Paul Taylor is Staff Scientist in Dynamics at Gulfstream Aerospace Corporation, where he has worked for the past 29 years. He has been involved in certification of all of Gulfstream's large cabin business jets since joining the company in 1993. He is currently a member of the Gulfstream Organization Designation Authority and prior to this was a Designated Engineering Representative of the FAA. He is an Associate Fellow of AIAA and a past chair of the AIAA Structural Dynamics Technical Committee and board member of the Savannah Science Seminar. Mr. Taylor's specialties include aircraft gust and



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dynamic loads, flutter, Fan Blade Off dynamic loads, flight flutter and loads testing, ground vibration testing, and aeroelastic wind tunnel testing. He received his Bachelor of Engineering in Aeronautical Engineering from the University of New South Wales in Sydney, Australia and Master of Science in Aerospace Engineering from the University of Southern California.

Track 5: Biomedical and Biotechnology

Monday, October 31,

9:45AM–10:30AM

Room: A210/A211

Greater Columbus Convention Center

The Brain in Motion: Visualizing Brain Biomechanics and Understanding Traumatic Brain Injury

Philip Bayly

Washington University in St. Louis

Abstract: High linear and angular accelerations of the skull can lead to rapid deformation of brain tissue and subsequent traumatic brain injury (TBI), but the precise mechanisms of TBI remain incompletely understood. Computer simulations of head-brain biomechanics offer enormous potential for improved understanding and prevention of TBI. However, simulations must be complemented by biomechanical measurements to parameterize and evaluate the underlying mathematical models. The nonlinear, anisotropic, viscoelastic, heterogeneous character of brain tissue, and the intricate connections between the brain and skull all play important roles in the brain's response to skull acceleration. Studies of animal brains and ex vivo brain tissue have led to important insights, but the measurements of the response of the intact human brain are necessary and complementary. On the other hand, efforts to understand the motion of the human brain in vivo are complicated by the fact that it is delicate, hidden, and well-protected by the skull. I will describe MR imaging techniques to characterize brain deformation, estimate brain material properties, and illuminate the boundary conditions between brain and skull, with the objective of improving the ability to model and simulate TBI.

Bio: Philip V. (Phil) Bayly is The Lee Hunter Distinguished Professor of Mechanical Engineering and Chair of the Department of Mechanical Engineering and Materials Science at Washington University in St. Louis. Dr. Bayly earned a B.A. in Engineering Science from Dartmouth College, an M.S. in Engineering from Brown University, and a Ph.D. in Mechanical Engineering from Duke University. Before pursuing his doctorate, he worked as research engineer for the Shriners Hospitals and as a design engineer for Pitney Bowes. Dr. Bayly has been a member of the faculty at Washington University since 1993, and Chair since 2008. His research involves the study of nonlinear dynamic phenomena in mechanical and biological systems. He is particularly interested in the use of imaging technology and image processing to understanding the mechanics and material properties of biological tissues and cells. His research has been funded by the National Science Foundation, the Office of Naval Research, and the National Institutes of Health.

Track 5: Biomedical and Biotechnology

Tuesday, November 1,

9:15AM–10:00AM

Room: A214/A215

Greater Columbus Convention Center

The Many Contributions of the Mechanical Engineer to Medical Devices

Kendall R. Waters

Siemens Healthineers

Abstract: Medical devices come in all shapes and sizes. Yet virtually every medical device has been (or should have been) touched by at least one mechanical engineer. These medical devices may be comprised of a range of materials, need to meet numerous mechanical performance requirements, or be manufactured by use of specialized processes. Mechanical engineers are generally well suited to handling such design and manufacturing needs.



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In the wide world of medical devices, one type of medical device that continues to regularly experience innovation is the catheter. Clinical applications of particular interest for this talk include electrophysiology and structural heart interventions. The number of catheters that are used for the diagnosis and treatment cardiac arrhythmias (e.g., atrial fibrillation) and structural heart disease (e.g., aortic valve stenosis), including image-guidance catheters, continues to grow.

In this talk I will provide an overview of the key roles that mechanical engineers play in the design and development of one type of medical device (intracardiac echocardiography catheters) and share thoughts on how to have an engaging career in medical devices.

Bio: Kendall R. Waters is Director of Intracardiac Echocardiography at Siemens Healthineers Ultrasound. He has been part of the medical device industry for over 15 years with much of his career focused on advanced technology development for medical ultrasound imaging devices and applications.

Kendall has product and technology development experience at a range of organizations, including global enterprises, small-medium businesses, start-ups, and national laboratories. He has been an R&D contributor on >10 medical products cleared by the FDA. He is also an inventor on >55 issued patents (from >20 patent families) related to medical imaging and sensing.

Kendall is an active member of the IEEE having held elected positions for both the Ultrasonics, Ferroelectrics, and Frequency Control Society and Consultants' Network of Silicon Valley. He has also served on the Board of Directors for medical devices start-ups. He holds a PhD and MA in Physics from Washington University in St. Louis and a BS in Physics and BA in Mathematics from the University of Texas at Austin.

Track 6: Design, Systems and Complexity

**Tuesday, November 1,
9:15AM–10:00AM**

Room: A216

Greater Columbus Convention Center

Projection-Based Additive Manufacturing: Spatiotemporal Properties and Data-Driven Image Planning Methods

Yong Chen

University of Southern California

Abstract: Additive manufacturing (AM) is a digital manufacturing process that can directly convert a computer-aided design model into a physical object in a layer-by-layer manner. Due to the additive and discrete nature of the digital manufacturing process, AM needs to find a trade-off between process resolution and production efficiency. Traditional AM processes balance the resolution and efficiency by tuning the processes either in the temporal domain (e.g., higher speed in serial processes) or in the spatial domain (e.g., more tools in parallel processes). To improve the resolution without sacrificing efficiency, a data-driven mask image planning method based on subpixel shifting in a split second by tuning the process in both temporal and spatial domains is presented. The method is based on the optimized pixel blending principle and a fast error diffusion-based optimization model. Various simulation and experimental tests are carried out to verify the developed subpixel shifting method. The experimental results demonstrate the data-driven-based mask image calibration and planning techniques significantly improve the fabricated part quality without compromising the process efficiency. The presented spatiotemporal strategy may shed light for future research on the projection-based AM processes.



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Bio: Dr. Yong Chen is a professor of Aerospace and Mechanical Engineering and Industrial and Systems Engineering at the University of Southern California (USC). His research focuses on additive manufacturing (3D printing) and related modeling, control, material, and application. He has published 1 edited book, 4 book chapters, and nearly 200 publications in refereed journals and conferences, as well as 12 issued and pending U.S. patents. His work has been recognized by over ten Best/Outstanding Paper Awards in major design and manufacturing journals and conferences and two USC Innovation Commercialization Awards. Other major awards he received include the National Science Foundation Faculty Early Career Development (CAREER) Award, the Outstanding Young Manufacturing Engineer Award from the Society of Manufacturing Engineers, and three invitations to the National Academy of Engineering Frontiers of Engineering Symposiums. Dr. Chen is a Fellow of the American Society of Mechanical Engineers (ASME). He has served as conference/program chairs as well as keynote speakers in several international design and manufacturing conferences, including the Conference Chair of the 2017 International Manufacturing Research Conference, the Program Co-chair of the 2019 International Design Engineering Technical Conferences (IDETC), and the Program Chair of the 2022 and 2021 Manufacturing Science and Engineering Conferences (MSEC). At USC, Dr. Chen teaches design and manufacturing-related courses to undergraduate and graduate students. Several Ph.D. students and post-doctors from his group have landed faculty positions in North American Universities. He also helped students and collaborators create four start-up companies related to 3D printing.

Track 7: Dynamics, Vibration, and Control

Tuesday, November 1,

9:15AM–10:00AM

Room: A226

Greater Columbus Convention Center

Flexoelectricity and Electrets

Pradeep Sharma

University of Houston

Abstract: The ability of certain materials to convert electrical stimuli into mechanical deformation, and vice versa, is a prized property. Not surprisingly, applications of such so-called piezoelectric materials are broad—ranging from energy harvesting to self-powered sensors. In this presentation, I will highlight a relatively understudied electromechanical coupling called flexoelectricity that appears to have implications in topics ranging from biophysics to the design of next-generation soft multifunctional materials. Specifically, I will argue, through computational examples, the tantalizing possibility of creating “apparently piezoelectric” materials without piezoelectric materials—e.g., graphene, emergence of “giant” piezoelectricity at the nanoscale, and (among others) the mechanisms underpinning magnetoreception in certain animals.

Bio: Pradeep Sharma is the M.D. Anderson Professor and Chair of Mechanical Engineering. He also has a joint appointment in the Department of Physics. He received his Ph.D. in mechanical engineering from the University of Maryland at College Park in the year 2000. Subsequent to his doctoral degree, he was employed at General Electric R & D for more than three years as a research scientist. He joined the department of mechanical engineering at University of Houston in January 2004. He is a member of the U.S. National Academy of Engineering. His other honors and awards include the Young Investigators Award from the Office of Naval Research, Thomas J.R. Hughes Young Investigator Award from the ASME, Texas Space Grants Consortium New Investigators Program Award, the Fulbright fellowship, the Melville medal, the James R. Rice medal from the Society of Engineering Science,



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ASME Charles R. Russ medal, the Guggenheim, and the University of Houston Research Excellence Award. He is a fellow of the ASME, the associate editor of the Journal of the Mechanics and Physics of Solids, chief-editor of the Journal of Applied Mechanics (from July 2022), and serves on the editorial board of several other journals. He specializes in the broadly defined fields of continuum mechanics of solids and theoretical and computational materials science.

Track 7: Dynamics, Vibration, and Control

Wednesday, November 2,

9:45AM–10:30AM

Room: A210/A211

Greater Columbus Convention Center

Fluid Structural Thermal Dynamic Interaction in Hypersonic Flow

Earl Dowell

Duke University

Abstract: The subject is the rich array of dynamic response that can occur when a flexible structure interacts with the forces due to a convecting fluid flow which also heats the structure. Buckling due to thermal stresses, dynamic instabilities (flutter) and limit cycle oscillations as well as response to random pressures in a fluid boundary layer, are all of interest. A hierarchy of fluid, structural and thermal models will be discussed. The advantages of using a modal representative of both the structural and thermal fields will be illustrated and the concept of using a linear dynamic perturbation of the flow field at various levels of flow modeling from potential flow to the Navier-Stokes equations will be noted. Finally, comparison of results from theory/computation with those from wind tunnel experiments will be used to assess the current state of the art and identify the need for further improvements in both theory and experiment.

Bio: Dr. Earl Dowell is an elected member of the National Academy of Engineering, an Honorary Fellow of the American Institute of Aeronautics and Astronautics (AIAA) and a Fellow of the American Academy of Mechanics and the American Society of Mechanical Engineers. He has also served as Vice President for Publications and member of the Executive Committee of the Board of Directors of the AIAA; as a member of the United States Air Force Scientific Advisory Board; the Air Force Studies Board, the Aerospace Science and Engineering Board and the Board on Army Science and Technology of the National Academies; the AGARD (NATO) advisory panel for aerospace engineering, as President of the American Academy of Mechanics, as Chair of the U.S. National Committee on Theoretical and Applied Mechanics and as Chairman of the National Council of Deans of Engineering. From the AIAA he has received the Structure, Structural Dynamics and Materials Award, the Von Karman Lectureship the Crichlow Trust Prize and the Reed Aeronautics Award; from the ASME he has received the Spirit of St. Louis Medal, the Den Hartog Award and Lyapunov Medal; and he has also received the Guggenheim Medal, which is awarded jointly by the AIAA, ASME, AHS, and SAE.

He has served on the boards of visitors of several universities and is a consultant to government, industry and universities in science and technology policy and engineering education as well as on the topics of his research.

Dr. Dowell's research ranges over the topics of aeroelasticity, nonsteady aerodynamics, nonlinear dynamics and structures. In addition to being author of over three hundred research articles, Dr. Dowell is the author or co-author of four books, Aeroelasticity of Plates and Shells, A Modern Course in Aeroelasticity, Studies in Nonlinear Aeroelasticity, and Dynamics of Very High Dimensional Systems. His teaching spans the disciplines of acoustics, aerodynamics, dynamics, and structures.

Dr. Dowell received his B.S. degree from the University of Illinois and his S.M. and Sc.D. degrees from the Massachusetts Institute of Technology. Before coming to Duke as Dean of the School of Engineering, serving from 1983–1999, he taught at M.I.T. and Princeton. He has also worked with the Boeing Company.



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Track 8: Energy

Monday, October 31,
9:45AM–10:30AM

Room: A226
Greater Columbus Convention Center

SMART CSP – How Artificial Intelligence Can Support Concentrating Solar Technologies

Robert Pitz-Paal, DLR Institute of Solar Research
DLR Institute for Solar Research

Abstract: Concentrating solar technologies are relatively complex systems that combine a large number of tracked concentration collectors, high temperature receivers and heat exchangers, a thermal storage system, and a power cycle. To optimize operation and lifetime of such systems, artificial intelligence (AI) approaches provide numerous benefits over physical model-based simulations. The talk will introduce state of the art technologies and their current market status before highlighting a number of AI approaches that have been developed at DLR. They comprise the tracking calibration of heliostats, soiling prediction of mirrors, degradation detection of solar collectors, cloud recognition, lifetime monitoring of receivers, and others.

Bio: Prof. Dr.-Ing. Robert Pitz-Paal is one of the two directors of the DLR Institute for Solar Research with more than 130 members of staff located in Cologne, Stuttgart, Jülich, Germany, and Almería, Spain. This is the largest research institution in Germany working in the field of concentrating solar technologies. This position is jointly assigned with a professorship at Aachen University. In 2008, Robert Pitz-Paal was also visiting Professor at the ETH in Zurich. His main research areas are the technical analysis and optimisation of concentrating solar power systems for generating electricity and producing fuel. He serves as associate editor for the Journal of Solar Energy and was the chairman of the SolarPACES (Solar Power and Chemical Energy Systems) technology Cooperation Programme of the International Energy Agency until 2021. He is also member of the board of the German Industry Association of CSP (DeutscheCSP). Pitz-Paal received

the Farrington-Daniels Award of the International Energy Society in 2017 and the Frank Kreith Energy Award 2021 of the ASME.

Track 9: Engineering Education

Thursday, November 3,
9:15AM–10:00AM

Room: A216
Greater Columbus Convention Center

Bio-Engineering: Pros and Cons of Navigating an Interdisciplinary Field

Dr. Gunjan Agarwal
The Ohio State University

Abstract: Bioengineering (BioE) is a growing interdisciplinary field encompassing the domains from mechanical, materials, electrical, chemical and computer engineering. Several institutions across the country (and worldwide) now have formal as well as informal BioE curricula or tracks in their undergraduate and graduate programs. When and why should one enter and embrace BioE? As a physicist entering the field of BioE, Dr. Agarwal will discuss her own trajectory and experiences in BioE over a span of two decades. Some unique challenges faced by BioE programs are to find the perfect balance between the depth and breadth in engineering education and compete with traditional engineering disciplines in the job market. However, BioE incentivizes graduate education and training and helps entice women and underrepresented minorities to the STEM fields. The interdisciplinary field of BioE extends engineering applications to agriculture, environmental science, marine biology, medicine and more and can open up new opportunities for professional as well as personal growth.

Bio: Dr. Gunjan Agarwal is a Professor in the Department of Mechanical and Aerospace Engineering (MAE) at the Ohio State University (OSU). She has diverse educational experiences across both academia and industry. Dr. Agarwal received her BS from the JK Institute of Applied Physics (Allahabad), MS (Physics) from the Indian Institute



TRACK PLENARY SESSIONS

of Technology (Delhi) and doctoral degree in Biophysics from the Tata Institute of Fundamental Research (Mumbai, India). She completed her post-doctoral training at the Albert Einstein College of Medicine (Bronx, NY) and Procter & Gamble Pharmaceuticals (Mason, OH) and was a research scientist at the Air Force Research Lab (WPAFB, OH). She was a faculty member in the Department of Biomedical Engineering (BME) at OSU for 15+ years, before joining MAE. She teaches graduate courses in Extracellular matrix, Medical Imaging and Microscopy. Dr. Agarwal is a faculty mentor in three engineering graduate programs (MAE, BME and MSE) and two interdisciplinary graduate programs (Biophysics and Ohio State Biochemistry Program).

Dr. Agarwal's research interests lie "outside the cell" on cell-matrix interactions and extracellular matrix remodeling with a particular focus on vascular and bone diseases. She extensively employs high-resolution microscopy techniques such as atomic force microscopy (AFM) and electron microscopy for her research. She also directs an AFM core facility at OSU and develops novel biomedical applications of AFM. She has published 4 book chapters and over 50 journal articles in well-reputed journals. Her research has been continuously funded by the NSF, NIH and the American Heart Association.

Track 10: Fluids Engineering

Thursday, November 3

9:15AM–10:00AM

Room: B230/B231

Greater Columbus Convention Center

The Convergence of Exascale Computing and Data Science Toward Zero-carbon Fuels for Power & Transportation

Jacqueline Chen

Sandia National Laboratories

Abstract: Mitigating climate change while providing the nation's transportation and power generation is important to energy and environmental security. While a potential shift to hydrogen as a zero-carbon fuel has attracted a

great deal of interest, an alternative shift to ammonia also has promise: ammonia has a higher volumetric energy density and is simpler to transport and store. However, ammonia has poor reactivity and forms NO_x and N₂O emissions. Its poor reactivity can be circumvented by blending it with more reactive fuels, e.g., by partial cracking of ammonia to form ammonia/hydrogen/nitrogen blends, but combustion of such blends at gas-turbine conditions—particularly the coupling between turbulence and fast hydrogen diffusion—is poorly understood and difficult to tailor. In this talk, I discuss how emerging exascale computing might in principle enable first-principles direct numerical simulation (DNS) of turbulent combustion of these blends, thus enabling for the first time a detailed understanding of pressure effects on combustion rate, blow-off limits, and chemical pathways for NO_x and N₂O formation. With the extreme scale data at the exascale, however, comes challenges for data management and analysis. Hence, I also discuss novel mitigation strategies, including on-the-fly model-driven data compression of high-dimensional reactive flow data (with O(100) species).

Bio: Jacqueline H. Chen is a Senior Scientist at the Combustion Research Facility at Sandia National Laboratories. She has contributed broadly to research in turbulent combustion elucidating turbulence-chemistry interactions in combustion through direct numerical simulations. To achieve scalable performance of DNS on heterogeneous computer architectures she leads an interdisciplinary team of computer scientists, applied mathematicians and computational scientists to develop an exascale direct numerical simulation capability for turbulent combustion with complex chemistry and multi-physics. She is a member of the National Academy of Engineering and a Fellow of the Combustion Institute and the American Physical Society. She is an Associate Fellow of the AIAA. She is member of the Council for the American Association for the Advancement of Science. She received the Combustion Institute's Bernard Lewis Gold Medal Award in 2018, the Society of Women Engineers Achievement Award in 2018, the Department of Energy Office of Science Distinguished Scientists Fellow Award in 2020, and the R&D100 Award for the Legion Programming System in 2020.



TRACK PLENARY SESSIONS

Track 11: Heat Transfer and Thermal Engineering

Wednesday, November 2,
9:45AM–10:30AM

Room: A216

Greater Columbus Convention Center

Multiscale Simulation Techniques for Sub-continuum Phonon and Gas-Phase

Jayathi Y. Murthy

University of California

Abstract: During the last two decades, a variety of efficient computational methods have been developed to understand the behavior of microscale devices and systems involving fluid flow and heat transfer. In this talk, we provide an integrated overview of multiscale finite volume methods for sub-continuum transport which recognize the commonality of the theory underlying phonon and gas-phase transport at small scales. In the particle limit, when coherence effects can be neglected, phonon transport may be described by the phonon Boltzmann transport equation. Wave-vector resolved descriptions are essential for understanding the physics underlying strongly non-equilibrium transport, such as that encountered in ultra-scaled transistors. However, phonon relaxation times in materials such as silicon span 4-5 orders of magnitude and the resulting spread in Knudsen number causes conventional computational algorithms to perform very poorly or even fail completely. Similar problems are encountered in rarefied gas dynamics, for example, in the Bhatnagar-Gross-Krook (BGK) model and its variants. Over the last decade, we have developed fast convergent finite volume schemes based on either multigrid methods or on hybrid continuum-BTE descriptions which address this range of Knudsen number and which are 2-200 times faster than existing schemes. We show that multigrid methods scale extremely well on large-scale parallel platforms. Furthermore, we have also developed Bayesian multiscale simulation techniques to span the range from molecular dynamics to continuum scales. Applications of these methods to sub-continuum heat transfer and fluid flow problems are presented.

Bio: Jayathi Murthy is the Ronald and Valerie Sugar Dean of the Henry Samueli School of Engineering and Applied Science at the University of California, Los Angeles. Previously she held the Ernest Cockrell Jr. Chair and served as Department Chair of Mechanical Engineering at The University of Texas at Austin. She also served as Director of the \$21M NNSA PRISM Center at Purdue for Prediction of Reliability, Integrity and Survivability of Microsystems during 2008-2014. She received her Ph.D degree from the University of Minnesota in the area of numerical heat transfer and has worked in both academia and in industry. She was an early employee of Fluent Inc., a leading vendor of CFD software, where she developed the widely-used unstructured solution-adaptive finite volume methods that underlie their flagship software Fluent, and the electronics cooling software package ICEPAK. More recently, her research has addressed sub-micron thermal transport, multiscale multiphysics simulations of MEMS and NEMS and uncertainty quantification in these systems. She is the recipient of numerous recognitions, including the ASME Heat Transfer Memorial Award and was inducted into the National Academy of Engineering and as a Foreign Fellow of the Indian National Academy of Engineering. Prof. Murthy has served on numerous national committees and panels on electronics thermal management and CFD, and is the author of over 300 technical publications.

Track 11: Heat Transfer and Thermal Engineering

Monday, October 31,
9:45AM–10:30AM

Room: A212/A213

Greater Columbus Convention Center

Radiation Environment in Space and Shielding Materials

Yildiz Bayazitoglu

Rice University



TRACK PLENARY SESSIONS

Abstract: Historically, most human space activities have taken place in the low Earth orbit, where most of the hazardous radiation is attenuated by the Van Allen belt. Only a few people who went to the moon travelled outside of the radiation protection zone and they stayed a very short period of time. The contemplated spaceflights beyond the Earth's magnetosphere or for colonization of places like the Moon and Mars require an extensive radiation protection research with reliable evaluation tools. A good radiation shielding material for humans and equipment should optimize several primary goals. It should effectively attenuate the Galactic cosmic rays, it should produce fewer secondary particles, and it should be structurally stable to carry the load. Among them, for example, aluminum is the most widely used passive shielding material for spacecrafts. Though structurally stable, aluminium is not good at shielding Galactic cosmic radiation, when the rays penetrate, it produces lots of neutrons. Polyacetylene decorated with titanium, lithium, or boron to facilitate enhanced hydrogen bonding and storage within the structure, radiation shield to produce improved blocking of dangerous particle radiation sources and to reduce secondary emission of dangerous neutrons. The doped polymer materials would appear to have no inherent limitations except perhaps the percentage of hydrogen that could be bound or stored. Even at the stage of its early development, it provides considerable improvement to shielding and also has structural integrity. The purpose of this presentation is to give an overview of space radiation environment, commonly used evaluation tools and methods, and to provide a perspective of Galactic cosmic radiation shielding materials.

Bio: Yildiz Bayazitoglu is the H.S. Cameron Chair Professor of Mechanical Engineering and Professor of Materials Science and Nanoengineering at Rice University, Houston Texas. She received all of her degrees in mechanical engineering, BS from the Middle East Technical University, Ankara, Turkey, and MS and PhD from the University of Michigan, Ann Arbor, Michigan. She co-authored Elements of Heat Transfer and its revision Textbook on Fundamentals of Heat Transfer. Bayazitoglu served as the chair of the Heat Transfer Division and the chair of Committee of Awards of ASME. She was an associate editor of ASME Journal of Heat Transfer and Editor-in-Chief of Inter IJTS for fourteen years. Currently, she is the vice president of the International Center of

Heat and Mass Transfer. At Rice, Bayazitoglu received Brown Superior Teaching Award, Outstanding College Associate Award, HM Rich Outstanding Invention Award, GSA Teaching-Mentoring Award, Chance Teaching Prize, University Faculty Impact Award and Presidential Mentoring Award. From the ASME, she received Heat Transfer Memorial Award and Heat Transfer Division Service Award. She is one of the ASME HTD 75th Anniversary Medal recipients. She is a Fellow and Honorary Member of the ASME, a Fellow of the American Association of Advancement of Science. She received the DEA and the Achievement Award from the Society of Women Engineers. She is the recipient of the University of Michigan, Engineering Alumni Merit Award. She received ICHMT Fellowship Award and elected honorary member of Turkish Academy of Sciences.

Track 12: Mechanics of Solids, Structures and Fluids

**Tuesday, November 1,
9:15AM–10:00AM**

Room: B230/B231

Greater Columbus Convention Center

Mechanics Dispels the Myth that Strike-Slip Fault Earthquakes Are Incapable of Generating Killer Tsunamis

Ares Rosakis

California Institute of Technology

Abstract: On September 28, 2018, an inexplicably large tsunami devastated the Indonesian coastal city of Palu (Sulawesi). Between the tsunami and the magnitude 7.5 earthquake that caused it, some 4,340 people were killed, making it the deadliest earthquake that year. The Palu earthquake rupture was super-shear (its speed exceeded the shear wave speed of crustal rock) and occurred on the strike-slip segment of the Palu-Koro fault system bisecting the narrow Palu bay. While tsunami generation from underwater ground motions associated with thrust-fault earthquakes has long been recognized as a major hazard to coastal and marine areas, the ability of underwater strike-slip faulting to generate substantial



TRACK PLENARY SESSIONS

tsunamis has been dismissed by tsunami experts. Here we discuss the results of a study which shows that near-fault ground motions due to strike-slip earthquakes can indeed create large tsunamis under rather generic conditions applicable to Palu and elsewhere. We demonstrate that super-shear, strike-slip earthquake ruptures are very efficient in producing tsunamis due to the interactions of resulting unattenuated shear Mach-Cones with close-by shorelines and bay boundaries. To this end, we have developed a coupled computational mechanics framework that integrates fully 3D models for earthquake rupture dynamics with fluid mechanics models of tsunami generation and propagation. The three-dimensional, time-dependent, vertical and horizontal ground motions from spontaneous dynamic rupture models are translated into a moving bathymetry of the bay that drives the 2D nonlinear shallow water-wave equations. We find that super-shear ruptures propagating along underwater, strike-slip faults, traversing narrow bays, are prime candidates for tsunami generation. We also show that the dynamic focusing effect and the large horizontal displacements, characteristic of strike-slip earthquakes (especially super-shear ones) on long faults, are the critical drivers for the tsunami hazard in bays. These findings point to intrinsic mechanisms for tsunami generation by strike-slip faulting that do not require us to invoke complex seismic sources, landslides, or complicated bathymetries. We identify three distinct phases in the tsunami motion: an instantaneous dynamic phase, a lagging co-seismic phase, and a classical post-seismic phase, each of which affect the coastal areas differently. We conclude by emphasizing the need for re-evaluating the near-source tsunami hazard to coastal areas (e.g., the SF bay area in CA or the bay of Al Aqaba in the Red Sea) from local strike-slip faults.

Bio: Ares J. Rosakis is the Theodore von Kármán Professor of Aeronautics and Mechanical Engineering at Caltech. He has served as the Director of Graduate Aerospace Laboratories, GALCIT (2004–2009) and as the Dean of Division of Engineering and Applied Science EAS (2009–2015). He is a fellow of U.S. National Academy of Sciences, U.S. National Academy of Engineering, the American Academy of Arts and Sciences, Academia Europaea, the European Academy of Sciences, the Academy of Athens, the Academia Scientiarum et Artium Europaea, and the Indian National Academy of

Engineering. He is also fellow of various professional societies and was honored with numerous awards and medals, such as the Timoshenko (ASME), von Kármán (ASCE), Eringen (SES), Bazant (ASCE), Theocaris (SEM), Kingslake (SPIE) and Horace Mann (Brown U.) medals, and has been named Commandeur dans l'Ordre des Palmes Académiques by the republic of France. He received his B.A. and M.A. from Oxford University and his M.S. and Ph.D. from Brown University.

Rosakis has contributed widely to Engineering and Geophysics and is credited with the experimental discovery of “Intersonic” or “Supershear” rupture processes in both coherent and frictional interfaces of relevance to the failure of both composite materials and to earthquake rupture processes. His research on materials and their failure processes spans a multitude of length and time scales ranging from sub- μm (reliability of thin films) to 105m (dynamic earthquake fault ruptures) and from nanoseconds (hypervelocity impact in space) to years (creeping ruptures and interfaces). Visit his website.

Track 12: Mechanics of Solids, Structures and Fluids

Monday, October 31

9:45AM–10:30AM

Room: B230/B231

Greater Columbus Convention Center

Turbulence of Low Temperature Helium

K.R. Sreenivasan

New York University

Abstract: Helium remains a liquid even down to zero Kelvin. A component of it flows without friction below about 2.17K. For flow speeds exceeding a critical value, vortices with certain quantum mechanical properties are formed spontaneously. Tangles of these vortices acquire properties similar to turbulence of ordinary fluids such as water and air. The talk will discuss these topics at an elementary level.



TRACK PLENARY SESSIONS

Bio: Professor K.R. Sreenivasan is a fluid dynamicist currently working in New York University. His work as a scholar and an academic leader has been recognized broadly. He was elected to the National Academy of Sciences (NAS), National Academy of Engineering (NAE), American Academy of Arts and Sciences (AAAS), Indian Academy of Sciences, Indian National Science Academy, Academy of Sciences for the Developing World (TWAS), African Academy of Sciences, and Accademia dei Lincei in Italy, among others. In particular, he is the recipient of the 2022 ASME Medal.

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

Wednesday, November 2,
9:45AM–10:30AM

Room: A226

Greater Columbus Convention Center

Quantification of the Interaction of a Streamwise Vortex With an Oblique Shock Wave at Supersonic Flows

Dr. Edward DeMauro
Rutgers University

Abstract: Stereoscopic particle image velocimetry (SPIV) is a useful tool for interrogating complex flow fields across a wide range of Mach numbers. Within a high-supersonic flow, performing SPIV is non-trivial and requires precise timing and attention to particle response. In this talk, I will provide an overview of our facility at Rutgers. I will focus on some of the challenges that we have had to overcome in implementing SPIV capabilities within our facility. Following this, I will provide an example of the measurements we perform within my group, focusing primarily on the interaction of a streamwise wing-tip vortex with an oblique shock wave (OSVI).

In high-speed flows, wing-tip vortices can impinge upon oblique shocks, potentially resulting in unwanted aerodynamic loading on a flight vehicle. Experiments were performed within a supersonic wind tunnel at a freestream Mach number of 3.4 to quantify the interaction of a streamwise vortex with a series of oblique shock waves using stereoscopic particle image velocimetry. For these experiments, the streamwise vortex was created using a diamond-shaped wing with a free-end, pitched to one of two angles of attack. Downstream of the wing, the streamwise vortex encountered an oblique shock, generated by a wedge ($\alpha = 15, 20, 25^\circ$). Measurements revealed that the resultant interactions could be classified as weak or moderate, depending on the swirl and shock strengths. Furthermore, a dramatic decrease in post-shock velocity was observed under the influence of even the weaker of the two vortices. Moderate interactions were associated with a conical shock formation, which gave rise to heightened levels of turbulence kinetic energy, implying unsteadiness in the structure. Following planar measurements, a pair of volumetric data sets were created for the $\alpha = 25^\circ$ shock encountering both vortices. The results demonstrated that the vortex persists intact downstream of the shock, while changing direction parallel to the shock generator surface.

Bio: Dr. Edward DeMauro is an assistant professor of the Department of Mechanical and Aerospace Engineering at Rutgers University, having joined the department in 2017. He obtained his B.S. and M.S. degrees in Aerospace Engineering from the University at Buffalo in 2006 and 2008, respectively. He then went on to receive his Ph.D. in Mechanical Engineering from Rensselaer Polytechnic Institute in 2012. From 2015 to 2016, Dr. DeMauro was a postdoctoral appointee within the Aerosciences Department within the Engineering Sciences Center at Sandia National Labs in, where he performed research on shock-particle interactions and transonic store separation. Dr. DeMauro is the director of the Emil Buehler Supersonic Wind Tunnel at Rutgers, where he conducts research into shock-vortex interactions, axisymmetric shock-boundary layer interactions, and laser energy deposition flow control. Dr. DeMauro is a senior member of the American Institute of Aeronautics and Astronautics (AIAA), having served as associate member of the Fluid Dynamics Technical Committee and Flow Control Subcommittee.



TRACK PLENARY SESSIONS

Recently, Dr. DeMauro received the 2020 AFOSR DURIP for acquisition of high-speed pressure-sensitive paint equipment. In addition, he has received funding from AFOSR for studying the aero-optics of high-speed shear layers.

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

Thursday, November 3,

9:15AM–10:00AM

Room: A212/A213

Greater Columbus Convention Center

Towards Scalable 2D Electronic Materials

Dr. Nicholas Glavin

Air Force Research Laboratory

Abstract: The rapid development of 2D materials for electronics has resulted in device engineers scrambling to tackle challenges associated with reaching device manufacturing at scale. In this talk, strategies and processes to enable scalable fabrication of devices which harness the multifunctional nature of 2D materials is presented. These techniques include low cost and customizable laser-manufacturing approaches, where high throughput structure/property evaluation can allow for rapid device design. This same process can be implemented in a roll-to-roll configuration to allow for manufacturing of 2D devices at scale for detection of a host of different sensing environments including detection of viruses and harmful vapors. Additionally, a two-step metal conversion process will be discussed that allows for direct synthesis of 2D transition metal dichalcogenide superlattices which can result in heterostructures of interest to future system development.

Bio: Dr. Nicholas R. Glavin is a Senior Materials Engineer in the Materials and Manufacturing Directorate at the Air Force Research Laboratory. His research is primarily focused on industrially-relevant processes to enable two-dimensional (2D) nanomaterials for DAF and USSF applications in electronics and sensors. These 2D nanomaterials have demonstrated viability in future capabilities in wearable devices, conformal radio frequency systems, electronic platforms with reduced SWAP, and low cost-high volume production of sensor devices. He has pioneered many key advances in the field including the first demonstration of an ultrathin a-BN dielectric, flexible gallium nitride device enabled by h-BN, current record limit of detection of volatile organic compounds in transition metal dichalcogenide systems, and roll-to-roll manufacturing of sensor materials for the ultrasensitive detection of chemical and biological threats. He has received numerous awards including the Charles J. Cleary Research Excellence Award, the Robert T. Schwartz Engineering Excellence Award, the Air Force Office of Scientific Research Star Team Award, and the Air Force John L. McLucas Honorable Mention. He is very active in numerous societies including American Vacuum Society (AVS), Materials Research Society (MRS), the International Microelectronics and Packaging Society (IMAPS), and the Institute of Electrical and Electronics Engineers (IEEE). He is currently the AVS Ohio Vice Chair, serves on the IMAPS Government and Defense Committee, and is on the advisory board for the Penn State Center for Biodevices.



TRACK PLENARY SESSIONS

Track 14: Safety Engineering, Risk and Reliability Analysis

Thursday, November 3,
9:15AM–10:00AM
Room: A226

Greater Columbus Convention Center

Propagation Based Fault Detection, Discrimination, and Safety Analysis for Industrial Systems

Carol Smidts

The Ohio State University

Abstract: Normal industrial system operations may be interrupted by faults not promptly detected and diagnosed. Faults may be introduced during the stages of system design, development, and operation. System safety can be improved by preventing fault occurrence or quickly identifying and isolating faults during system operation in the event of a fault occurrence. On the one hand, fault prevention can be achieved by improving system design. On the other hand, fault detection and isolation can be achieved by using efficient online monitoring systems. This presentation introduces how the Integrated System Fault Analysis (ISFA) technique and fault ontologies can be used to address these two problems.

The ISFA technique uses qualitative physics and first principles to model the behaviors of system components. It also establishes functional failure logics based on propositional logic for identifying the states of system functions. Fault ontologies, defined as a domain knowledge repository with various types of faults and their attributes, can be employed to generate the possible faults that may occur during system operation. Based on the qualitative models, the ISFA technique utilizes the solver of satisfiable modulo theory to infer fault propagation paths through the system under analysis. The analysis results can then be used to identify the critical components whose failures will cause catastrophic consequences. System safety can be improved by advancing the reliability of such components or changing

the system structure to mitigate the consequence when a fault occurs. In addition, the ISFA outputs can be used to improve the efficiency of online monitoring systems by optimizing the deployment of sensors used for monitoring. The optimal sensor deployment is obtained by evaluating the signal features inferred by the ISFA solver. Applications of the methods introduced include nuclear power systems, hybrid energy systems, and real time computer systems.

Bio: Dr. Carol Smidts is a Professor of Nuclear, Mechanical, and Aerospace Engineering at The Ohio State University. Her research lies in risk and reliability analysis and in human factors, instrumentation and control, including human reliability analysis, probabilistic analysis of dynamics for complex systems, reliability analysis of digital instrumentation and control systems, software reliability modeling and software test automation, and distributed test facility design. Additionally, she is the author of more than 190 refereed journal and conference publications, as well as the recipient of multiple awards and 4 patents. Her research has been sponsored by Government (DOE, AFSOR, AFRL, NRC, NASA, NSF, FAA, DOD, NSA) as well as by industry (Texas Instruments, IBM). She is an IEEE Fellow and was the conference co-Chair of the IEEE International Symposium on Software Reliability Engineering (2006 and 2013), IEEE High Assurance Systems Engineering (2008), NPIC-HMIT (2019), and technical program chair for Probabilistic Safety Assessment (2021), an Associate Editor for Software Testing Verification and Reliability, and she is the Chair of ANS' Human Factors Instrumentation and Control Division (HFICD).



Technical Sessions

***Please see the conference app for the most up to date information*



TECHNICAL SESSIONS

Track 1: Acoustics, Vibration, and Phononics Sponsored by the Noise Control and Acoustics Division

Topics:

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

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TECHNICAL SESSIONS

TRACK 1

TUESDAY, NOVEMBER 1

Track 1: Acoustics, Vibration, and Phononics

Tuesday, November 1, 9:15AM-10:00AM

Room: A210/A211

Greater Columbus Convention Center

Title: Passive flow control by subsurface phonon motion*Dr. Mahmoud Hussein, University of Colorado Boulder***1-1: Phononic Crystals and Metamaterials****01-01-01: General Phononics****10:15AM–12:00PM - CONVENTION CENTER, C151****10:15AM****The Atomistic Green's Function Method for Acoustic and Elastic Wave Problems****Technical Presentation: IMECE2022-99758***Hossein Khodavirdi - Illinois Institute of Technology**Zhun-Yong Ong - Institute of High Performance Computing**Ankit Srivastava - Illinois Institute of Technology***10:36AM****Coupling Between Static and Dynamic Properties: Exploration Within a Family of Simple Phononic Crystals****Technical Presentation: IMECE2022-100090***Mamdudur Rahman - University of South Carolina**William Johnson - Savannah River National Laboratory**Timothy Krentz - Savannah River National Laboratory**Dale Hitchcock - Savannah River National Laboratory**Andrew J. Gross - University of South Carolina***10:57AM****Reduced Order Modeling of Mechanical Metamaterials for Deep Generative Design Optimization****Technical Presentation: IMECE2022-100183***Weidi Wang - University of Massachusetts Lowell**Alireza Amirkhizi - University of Massachusetts Lowell***11:18AM****Continuum Modelling and Analysis of Periodic Elastic Metamaterials With Local Rotation****Technical Presentation: IMECE2022-100269***Antonio Schiavone - University of Alberta**Zhengwei Li - University of Alberta**Xiaodong Wang - University of Alberta***11:39AM****Design and Numerical Analysis of Locally-Resonant Meta-Lattice Structures for Vibration Attenuation****Technical Paper Publication: IMECE2022-95206***Utku Güngör - TOBB University of Technology and Economics**Ahmet Arda Kurt - TOBB University of Economics and Technology**Mert Lale - TOBB University of Economics and Technology**Furkan Acar - TOBB University of Economics and Technology**Recep Muhammet Görgülüarslan - TOBB University of Economics and Technology**Hakkı Özgür Ünver - TOBB University of Economics and Technology*

TECHNICAL SESSIONS

TUESDAY, NOVEMBER 1

1-3: Passive, Semi-Active, and Active Noise and Vibration Control**01-03-01: Passive, Semi-Active, and Active Noise and Vibration****10:15AM–12:00PM - CONVENTION CENTER, D180****10:15AM**

Electro-Mechanical Design of a Vacuum Chamber With Vibration and Noise Dampening Capabilities on an Autonomous Undersea Vehicle

Technical Paper Publication: IMECE2022-96018

*Matthew Cunha - Wentworth Institute of Technology
Richard Martel - Wentworth Institute of Technology
Philip Chagnon - Wentworth Institute of Technology
Benjamin Jackson - Wentworth Institute of Technology
James Mccusker - Wentworth Institute of Technology
Gloria Ma - Wentworth Institute of Technology*

10:36AM

Spatial Pendulum TMD With Two Tuning Frequencies

Technical Paper Publication: IMECE2022-96610

*Waled T.A. Mohamed - University of Dayton
Ahmad Kashani - University of Dayton*

10:57AM

Reduction in Horizontal and Vertical Vibrations by Frequency Tunable Dynamic Absorber Using Elliptical Shaped Magneto-Rheological Elastomer

Technical Presentation: IMECE2022-99071

*Kohei Ono - Toyama Prefectural University
Ryo Kiyotaki - Toyama Prefectural University
Zhe Li - Toyama Prefectural University
Osamu Terashima - Toyama Prefectural University
Toshihiko Komatsuzaki - Kanazawa University*

11:18AM

Tunable 3D Printed Damper for In-Space Additive Manufacturing

Technical Presentation: IMECE2022-99684

*Ziyad Abouelenin - Rutgers University
Christopher Gorka - Rutgers University
John Wiech - Rutgers University
Antonio Bu Sha - Rutgers University
Patrick Hull - NASA Marshall Space Flight Center
Aaron Mazzeo - Rutgers University*

1-1: Phononic Crystals and Metamaterials**01-01-02: Topological Phononics****1:30PM–3:15PM - CONVENTION CENTER, C151****1:30PM**

Topological and Tamm Modes in Electromechanical Lattice Structures

Technical Presentation: IMECE2022-99664

*Sai Aditya Raman Kuchibhatla - Georgia Institute of Technology
Michael Leamy - Georgia Institute of Technology*

1:51PM

Characterization of Elastic Topological States Using Dynamic Mode Decomposition

Technical Presentation: IMECE2022-99505

*Shuaifeng Li - University of Washington
Panayotis Kevrekidis - University of Massachusetts
Jinkyu Yang - University of Washington*



TECHNICAL SESSIONS

TUESDAY, NOVEMBER 1

2:12PM**Self-Dual Kagome Lattices and Finite-Frequency Maxwell-Like Topological Modes****Technical Presentation: IMECE2022-100179***Hrishikesh Danawe - University of Michigan**Heqiu Li - University of Toronto**Kai Sun - University of Michigan**Serife Tol - University of Michigan***2:33PM****Continuous Dirac Cone Evolution in Modulated Phononic Crystal****Technical Paper Publication: IMECE2022-95839***Megan Hathcock - University of Michigan**Bogdan Popa - University of Michigan**Kon-Well Wang - University of Michigan***1-2: General****01-02-01: General****1:30PM–3:15PM - CONVENTION CENTER, D180****1:30PM****Developing a Consistent Resonance-Induced Fatigue Testing Method on Novel Freely Supported Specimens****Technical Paper Publication: IMECE2022-95222***Lorean Napper - Griffiss Institute***1:51PM****Effect of Air Gap, Thickness of Polyurethane (PU) Foam, and Perforated Panel on Sound Absorption Coefficient for Acoustic Structures****Technical Paper Publication: IMECE2022-96880***Chetan Patil - Dr. Vishwanath Karad MIT World Peace University Pune**Ratnakar Ghorpade - Dr. Vishwanath Karad MIT World Peace University**Rajesh Askhedkar - Kirloskar Oil Engine Ltd.***2:12PM****Alignment of Nanomaterials in Hydrogels by Using Standing Surface Acoustic Wave-Enable****Technical Paper Publication: IMECE2022-97095***Jiali Li - Mississippi State University**Luyu Bo - Mississippi State University**Teng Li - Mississippi State University**Zhenhua Tian - Virginia Polytechnic Institute and State University***2:33PM****Preserving Auditory Cues for Human Echolocation Training: A Geometrical Acoustics Study Using a Benchmark Dataset (BRAS)****Technical Paper Publication: IMECE2022-97044***Jonas Karlberg - University of Iceland**Alessia Milo - Treble ehf**Finnur Pind - Treble ehf**Runar Unnthorsson - University of Iceland***2:54PM****A Numerical Study of Pickleball Sound Mitigation for Urban Environments****Technical Presentation: IMECE2022-99816***Subhrodeep Ray - Temple University**Benjamin Wu - Garnet Valley High School**Haijun Liu - Temple University*

TECHNICAL SESSIONS

TUESDAY, NOVEMBER 1

1-10: Flow-Induced Noise and Vibration**01-10-01: Flow-Induced Noise and Vibration Count****3:30PM–5:15PM - CONVENTION CENTER, D180****3:30PM****2D Numerical Ultrasound Computed Tomography for Elastic Material Characterization in Metals****Technical Paper Publication: IMECE2022-90232***Md. Aktharuzzaman - The University of Alabama**Shoaib Anwar - The University of Alabama**Dmitry Borisov - The University of Kansas**Jing Rao - University of New South Wales**Jiaze He - The University of Alabama***3:51PM****Ultrasonic Characterization of AlSi10Mg Specimens Printed by Direct Energy Deposition Technology****Technical Paper Publication: IMECE2022-96236***Mariya Chukovenkova - New Mexico Institute of Mining and Technology**Andrei Zagrai - New Mexico Institute of Mining and Technology**H. Scott Halliday - Navajo Technical University**Joshua Toddy - Navajo Technical University**Nylana J. Murphy - Navajo Technical University***4:12PM****Characterization of Aluminum and Steel Thin Plates Using Electromagnetic Acoustic Transducers****Technical Paper Publication: IMECE2022-96395***Lukas Peterson - New Mexico Institute of Mining and Technology**Andrei Zagrai - New Mexico Institute of Mining and Technology***4:33PM****Damage Identification for Beam-Like Structures Based on Proper Orthogonal Modes of Guided Wavefields****Technical Presentation: IMECE2022-99546***Wei Zhou - University of Cincinnati**Yongfeng Xu - University of Cincinnati***1-1: Phononic Crystals and Metamaterials****01-01-03: Applied Phononics****3:30PM–5:15PM - CONVENTION CENTER, C151****3:30PM****Acoustic Holographic Lenses in High-Intensity Ultrasound Applications****Technical Presentation: IMECE2022-97090***Ahmed Sallam - Virginia Tech**Shima Shahab - Virginia Tech***3:51PM****Direction-Selective Harmonic Wave Suppression in Non-Hermitian Acoustic Phased Arrays****Technical Presentation: IMECE2022-99523***Revant Adlakha - University at Buffalo (SUNY)**Mostafa Nouh - University at Buffalo (SUNY)***4:12PM****Patterning Ultrasound Pressure Fields in Inhomogeneous Acoustic Media****Technical Presentation: IMECE2022-97082***Ahmed Sallam - Virginia Tech**Eric Hoffmann - Virginia Tech**Shima Shahab - Virginia Tech***4:33PM****Magic Phononic Structures****Technical Presentation: IMECE2022-99911***Marupong Vongsiri - Wichita State University**Maria Jose Carrillo-Munoz - Wichita State University**Bhisham Sharma - Wichita State University*

TECHNICAL SESSIONS

WEDNESDAY, NOVEMBER 2

WEDNESDAY, NOVEMBER 2

01-13-01: Congress-Wide Symposium on NDE & SHM: Computational Nondestructive Evaluation and Structural Health Monitoring Count
10:45AM–12:30PM - CONVENTION CENTER, D180
10:45AM
Guided Wave Damage Imaging of Composite Laminates With Least Squares Reverse Time Migration (LSRTM)
Technical Paper Publication: IMECE2022-90231
Jiaze He - University of Alabama
Anthony Schwarberg - University of Alabama
11:06AM
Acoustic Emission Measurement and Location Analysis of Acoustic Emission Source for Superconducting Coil Quench During Training
Technical Paper Publication: IMECE2022-91393
Junko Hirokawa - Toshiba Corporation
Osamu Nishimura - Toshiba Corporation
Yousuke Hisakuni - Toshiba Corporation
Akira Kano - Toshiba Corporation
Hideaki Uehara - Toshiba Corporation
Tomoko Monda - Toshiba Corporation
Kenji Hirohata - Toshiba Corporation
Toshinobu Ito - Toshiba Energy Systems & Solutions Corporation
Shohei Takami - Toshiba Energy Systems & Solutions Corporation
Tomofumi Orikasa - Toshiba Energy Systems & Solutions Corporation
Kiyokazu Sato - Toshiba Energy Systems & Solutions Corporation
11:27AM
Unsupervised Online Anomaly Detection of Metal Additive Manufacturing Processes via a Statistical Time-Frequency Domain Approach
Technical Paper Publication: IMECE2022-94486
Alvin Chen - Rensselaer Polytechnic Institute
Fotis Kopsaftopoulos - Rensselaer Polytechnic Institute
Sandipan Mishra - Rensselaer Polytechnic Institute
11:48AM
A Machine Learning Framework for Physics-Based Multi-Fidelity Modeling and Health Monitoring for a Composite Wing
Technical Paper Publication: IMECE2022-94850
Gaurav Makkar - Rensselaer Polytechnic Institute
Cameron Smith - Rensselaer Polytechnic Institute
George Drakoulas - FEAC Engineering
Fotis Kopsaftopoulos - Rensselaer Polytechnic Institute
Farhan Gandhi - Rensselaer Polytechnic Institute
1-1: Phononic Crystals and Metamaterials
01-01-04: Elastic and Acoustic Metamaterial
10:45AM–12:30PM - CONVENTION CENTER, C151


TECHNICAL SESSIONS

WEDNESDAY, NOVEMBER 2

10:45AM**Experimental Investigation of 3D Printed Viscoelastic Metamaterials****Technical Presentation: IMECE2022-99559***Othman Oudghiri-Idrissi - University of Michigan Ann Arbor**Hrishikesh Danawe - University of Michigan Ann Arbor**Wei-Chun Lu - University of Michigan Ann Arbor**Serife Tol - University of Michigan Ann Arbor***11:06AM****Conditions and Mechanisms of Local Resonance Band Gap Merging in Dual-Periodic Acoustic Metamaterials****Technical Presentation: IMECE2022-99108***Adrian Stein - University at Buffalo (SUNY)**Mostafa Nouh - University at Buffalo (SUNY)**Tarunraj Singh - University at Buffalo (SUNY)***11:27AM****Polarized Source Model for Active Metamaterials With Extreme Acoustic Properties****Technical Presentation: IMECE2022-99106***Dylan Kovacevich - University of Michigan**Bogdan-loan Popa - University of Michigan***11:48AM****Metamaterials With Independently Tunable Acoustic Properties****Technical Presentation: IMECE2022-99214***Vinod Ramakrishnan - University of California, San Diego**Michael Frazier - University of California, San Diego***12:09PM****Ray Theory for Wave Propagation in Graded Metamaterials****Technical Presentation: IMECE2022-99500***Charles Dorn - ETH Zürich**Dennis Kochmann - ETH Zürich***1-14: Wave Propagation in Heterogenous and Architected Media****01-14-01: Wave Propagation in Heterogenous and Architected Media****2:00PM–3:45PM - CONVENTION CENTER, D180****2:00PM****Dynamics of Metastructure Beams Under Rotation****Technical Presentation: IMECE2022-99633***Gizem Acar - Stevens Institute of Technology**Aya Zaatreh - Stevens Institute of Technology**Aashutosh Kulakarni Prachet - Stevens Institute of Technology***2:21PM****Anomalous Polarization in Triply Periodic Minimal Derived Surfaces Lattices****Technical Presentation: IMECE2022-99901***Maria Jose Carrillo-Munoz - Wichita State University**Saranchana Keattitorn - Wichita State University**Bhisham Sharma - Wichita State University*

TECHNICAL SESSIONS

WEDNESDAY, NOVEMBER 2

2:42PM**Comments on Numerical Methods for Waves in Time-Dependent Media****Technical Presentation: IMECE2022-99991***Hussein Nassar - University of Missouri**Andrew Norris - Rutgers University**Guoliang Huang - University of Missouri-Columbia***1-4: Analytical and Computational Acoustics and Vibrations****01-04-01: Analytical and Computational Acoustics and Vibrations****2:00PM–3:45PM - CONVENTION CENTER, C151****2:00PM****Dynamic Analysis of a Curved Beam With Tuning of Elastic Modulus and Mass Density in Circumferential Direction****Technical Presentation: IMECE2022-88857***Hamid Nayeb Hashemi - Northeastern University**Milad Tatari - Northeastern University***2:21PM****Simplified Geometries for Intracranial Acoustic Modeling****Technical Paper Publication: IMECE2022-96161***Marianne Cites - University of Pittsburgh**Christopher Dumm - University of Pittsburgh**Anna Hiers - University of Pittsburgh**George Klinzing - University of Pittsburgh**Carey Balaban - University of Pittsburgh**Jeffrey Vipperman - University of Pittsburgh***2:42PM****Modeling and Analysis of Multiple Electrostatic Actuators on the Response of Vibrotactile Haptic Device****Technical Paper Publication: IMECE2022-96616***Santosh Mohan Rajkumar - Miami University**Kumar Vikram Singh - Miami University**Jeong-Hoi Koo - Miami University***3:03PM****Investigation of Low-to-High Intensity Through-Wall Ultrasound Power Transfer Systems****Technical Presentation: IMECE2022-96991***Moustafa Sayed Ahmed - Virginia Tech**Mehdi Ghommem - American University of Sharjah**Shima Shahab - Virginia Tech***3:24PM****Development of an Improved Mathematical Representation Which Captures the Nonlinear Dynamic Behavior of a Drill-String Assembly****Technical Paper Publication: IMECE2022-95551***Eleazar Marquez - The University of Texas Rio Grande Valley***1-8: Vibration and Acoustic Measurements, Signal Processing, and Test Facilities****01-08-01: Vibration and Acoustic Measurements, Signal Processing, and Test Facilities****4:00PM–5:45PM - CONVENTION CENTER, C151****4:00PM****Full-Field Operating Deflection Shape Measurement of a Structure With a Curved Surface Using a Three-Dimensional Continuously Scanning Laser Doppler Vibrometer System**

TECHNICAL SESSIONS

WEDNESDAY, NOVEMBER 2

Technical Paper Publication: IMECE2022-94706

*Ke Yuan - University of Maryland, Baltimore County
Weidong Zhu - University of Maryland, Baltimore County*

4:21PM

Vibrotactile Sleeve to Improve Music Enjoyment of Cochlear Implant Users

Technical Paper Publication: IMECE2022-95591

*Nashmin Yeganeh - University of Iceland
Ivan Makarov - University of Iceland
Snorri Steinn Stefánsson Thors - University of Iceland
Hafliði Ásgeirsson - University of Iceland
Árni Kristjánsson - University of Iceland
Rúnar Unnþórsson - University of Iceland*

Microscopic Optical Acoustic Sensors for Intracranial Measurements

Technical Paper Publication: IMECE2022-96139

*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*

5:03PM

Labeling Melanoma Cells With Black Microspheres for Improved Sensitivity in Detection via Photoacoustic Flow Cytometry

Technical Presentation: IMECE2022-99496

*Tori Kocsis - Duquesne University
John Viator - Duquesne University
Jennifer Schinke - Duquesne University*

5:24PM

An Experimental Realization of a Thermoacoustic-Based Gas Analyzer

Technical Presentation: IMECE2022-100033

*Ethan Fort - University at Buffalo (SUNY)
Mohamed Mousa - University at Buffalo (SUNY)
Mostafa Nouh - University at Buffalo (SUNY)*



TECHNICAL SESSIONS

Track 2: Advanced Manufacturing Sponsored by the Manufacturing Engineering Division

Topics:

- 2-1: 7th Annual Conference-Wide Symposium on Additive Manufacturing
- 2-2: Measurement Science, Sensors, Non-destructive Evaluation (NDE) and Process Control for Advanced Manufacturing
- 2-3: Nanomanufacturing: Novel Processes, Applications, and Process-Property Relationships
- 2-4: Advanced Machining and Finishing Processes
- 2-5: 7th Symposium on Fastening and Joining Research and Advanced Technology
- 2-6: Advanced Material Forming - Mechanics, Characterization, Novel Processes, and Control
- 2-7: Innovative Product and Process Design
- 2-8: Computational Modeling and Simulation for Advanced Manufacturing
- 2-9: Variation Simulation and Design for Assembly
- 2-10: Robotics and Automation in Advanced Manufacturing
- 2-11: Laser-Based Advanced Manufacturing and Materials Processing
- 2-12: Digital Manufacturing Process Simulation and Validation
- 2-13: Tribological Issues in Materials, Manufacturing, and Medicine - A Symposium in Honor of Professor Said Jahanmir
- 2-14: 3D/4D BioManufacturing & BioMaterials
- 2-15: Sustainable Manufacturing Systems
- 2-16: Manufacturing: General

ACKNOWLEDGMENT TRACK ORGANIZERS

Track Organizer: Muhammad Jahan

Track Co-Organizer: Ross Salary

Track Co-Organizer: Scott Thompson

Track Co-Organizer: Yifei Jin

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Arun Muley, Boeing

Chetan Nikhare, Penn State Erie

Chih-Hao Chang, North Carolina State University

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David A. Guerra-Zubiaga, Kennesaw State University

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Puneet Tandon, IITDM Jabalpur, India.

Roosbeh (Ross) Salary, Marshall University (West Virginia State)

Salman Pervaiz, RIT (Dubai)



TECHNICAL SESSIONS

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Chandra Sekhar Rakurty - MK Morse Co.

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Zhijun Wu - Oakland University



TECHNICAL SESSIONS

MONDAY, OCTOBER 31

TRACK 2

MONDAY, OCTOBER 31

Track 2: Advanced Manufacturing

Monday, October 31, 9:45AM-10:30AM

Room: A214/A215

Greater Columbus Convention Center

Title: Next Generation Manufacturing for Advancing Circular Economy with Sustainable Products from Sustainable Manufacturing Processes

Dr. I.S. Jawahir

University of Kentucky

2-1: 7th Annual Conference-Wide Symposium on Additive Manufacturing

02-01-01: 7th Annual Conference-Wide Symposium on Additive Manufacturing: Metals I

10:45AM–12:30PM - CONVENTION CENTER, C151

10:45AM

A Physics-Based Model of Selective Laser Melting of NITI Shape Memory Alloy: Laser Single Track and Melt Pool Dimension Prediction

Technical Paper Publication: IMECE2022-96912

Hossein Abedi - The University of Toledo

Reza Javan - The University of Toledo

Mohammad Reza Nematollahi - The University of Toledo

Keyvan Safaei - The University of Toledo

Anwar Al-Gamal - The University of Toledo

Mohammad Elahinia - The University of Toledo

Ala Qattawi - The University of Toledo

11:06AM

Particle Flow and Packing Behavior of Electron Beam Melting Ti-6Al-4V Powder Under Atmospheric and Vacuum Conditions

Technical Paper Publication: IMECE2022-96806

Garrett Kelley - University of Washington

Ramulu Mamidala - University of Washington

11:27AM

Physics-Based Microstructure Modeling for Grain Tailoring and Refinement in Wire Arc Additively Manufactured Ti6Al4V Alloy

Technical Paper Publication: IMECE2022-96493

Tugrul Ozel - Rutgers University

Hamed Shokri - Rutgers University-New Brunswick

Hamed Hosseinzadeh - University of South Carolina

11:48AM

Hybrid Manufacturing Decomposition Rules and Programming Strategies for Service Parts

Technical Paper Publication: IMECE2022-95560

Ruth Jill Urbanic - University of Windsor

Bob Hedrick - CAMufacturing Solutions Inc.

Hamoon Ramezani - CAMufacturing Solution Inc.

Sandy El Moghazi - CAMufacturing Solutions Inc.

Marzie Saghafi - University of Windsor

12:09PM

Modeling Thermal Behavior and Residual Stress for Layer-by-Layer Rotated Scan Direction in Laser Powder Bed Fusion Process

Technical Paper Publication: IMECE2022-95355

Md. Saidur Rahman Roney - Western Carolina University

Nazmul Ahsan - Western Carolina University

Hayri Sezer - Georgia Southern University

Joseph Tang - Western Carolina University

Sudhir Kaul - Western Carolina University

Hossain Ahmed - Georgia Southern University



TECHNICAL SESSIONS

MONDAY, OCTOBER 31

2-2: Measurement Science, Sensors, Non-destructive Evaluation (NDE) and Process Control for Advanced Manufacturing

02-02-01: Session #1: Measurement Science, Sensors, Non-destructive Evaluation (NDE) and Process Control for Advanced Manufacturing

10:45AM–12:30PM - CONVENTION CENTER, D180

10:45AM

Identification of Flaws and Assessment of Mechanical Properties in Additively Manufactured Titanium Parts Using Acoustic Resonance Ultrasound Spectroscopy (RUS)

Technical Paper Publication: **IMECE2022-94871**

Hossein Taheri - Georgia Southern University
Caleb Williams - Georgia Southern University
Russell Krenk - Georgia Southern University
Gregory Weaver - WeaverNDT
Mohammad Taheri - South Dakota State University

11:06AM

Non-Destructive Evaluation of Embedded Cracks in Metal by Ultrasound: Experimental Investigation

Technical Paper Publication: **IMECE2022-94929**

Sk. Yasin Habib Abir - Bangladesh University of Engineering and Technology
S.H.M. Muntasir Rahi - Bangladesh University of Engineering and Technology
Mohaimenul Hasan - Bangladesh University of Engineering and Technology
Titan Chandra Paul - University of South Carolina Aiken

11:27AM

Macro Level National Quality Infrastructure Capability Assessment in Ethiopia

Technical Paper Publication: **IMECE2022-95093**

Mesfin Demissie - Addis Ababa University
Frank Ebinger - Nuremberg Campus of Technology
Birhanu Beshah - Addis Ababa University

11:48AM

Predicting the Hounsfield Unit (Hu) of Aluminum Alloy Aa2011 From the Weight Fractions of Its Alloying Elements: An X-Ray Computed Tomography Study

Technical Paper Publication: **IMECE2022-95313**

Ahmad Baydoun - American University of Beirut
Ramsey Hamade - American University of Beirut

12:09PM

Distributed Acoustic Sensing (DAS) for Intelligent In-Motion Transportation Condition Monitoring

Technical Paper Publication: **IMECE2022-95366**

Hossein Taheri - Georgia Southern University
Michael Jones - Georgia Southern University
Suyen Bueso Quan - Georgia Southern University
Maria Gonzalez Bocanegra - Georgia Southern University
Mohammad Taheri - South Dakota State University

2-6: Advanced Material Forming - Mechanics, Characterization, Novel Processes, and Control

02-06-01: Session #1: Advanced Material Forming - Novel Processes, Mechanics, Characterization, and Control

10:45AM–12:30PM - CONVENTION CENTER, D181

10:45AM

The Development of a Friction Stir Extrusion Machine for Producing Multiscale Extruded Cylinders and Hollow Tubes

Technical Paper Publication: **IMECE2022-89539**

William Emblom - Emblom Engineering
Christopher Foreman - University of Louisiana at Lafayette
Charles Kreamer - University of Louisiana at Lafayette
Sydney Frazier - University of Louisiana at Lafayette
Seth Doiga - University of Louisiana at Lafayette
Michael Leaumont - University of Louisiana at Lafayette



TECHNICAL SESSIONS

MONDAY, OCTOBER 31

Ayotunde Olayinka - University of Louisiana at Lafayette
 Paul Darby - University of Louisiana at Lafayette
 Scott Wagner - Michigan Technological University

11:06AM

The Influence of Magnetic Vector Potential in Electroplasticity

Technical Paper Publication: IMECE2022-93909

Tyler Grimm - Clemson University
 Laine Mears - Clemson University

11:27AM

Investigation of Tube Sheet Joining Through Hydroforming Process

Technical Paper Publication: IMECE2022-94999

Shabbir Memon - Wichita State University
 Chetan Nikhare - Penn State Behrend

11:48AM

A Numerical Analysis on Taper Tube Hydroforming

Technical Paper Publication: IMECE2022-95536

Shabbir Memon - Wichita State University
 Chetan Nikhare - Penn State Behrend

12:09PM

Effect of Ageing and Environmental Conditions on Mechanical Properties of 3D Printed Parts

Technical Paper Publication: IMECE2022-95588

Oginne Rashid Lapuz - Dubai Electricity and Water Authority
 Hayk Vasilyan - Dubai Electricity and Water Authority
 Saleh Ghalib Atatreh - Dubai Electricity and Water Authority
 Mozah Alyammahi - Dubai Electricity and Water Authority
 Ahmad Abdulla Al Mheiri - Dubai Electricity and Water Authority
 Rahmat Agung Susantyoko - Dubai Electricity and Water Authority

2-10: Robotics and Automation in Advanced Manufacturing

02-10-01: Session #1: Robotics and Automation in Advanced Manufacturing

10:45AM–12:30PM - CONVENTION CENTER, A220

10:45AM

Grid-Video Measurement Method for A-Ugv's Small Obstacle Avoidance Performance

Technical Paper Publication: IMECE2022-88658

Soocheol Yoon - National Institute of Standards and Technology

Roger Bostelman - Smart HLPR, LLC

Ann Virts - National Institute of Standards and Technology

11:06AM

Prototype Design and Manufacture of a Deployable Tensegrity Microrobot

Technical Paper Publication: IMECE2022-93929

Christian Kazoleas - Lawrence Technological University
 Kaushik Mehta - Lawrence Technological University
 Sichen Yuan - Lawrence Technological University

11:27AM

Assembly Automation Using an Industrial Robot

Technical Paper Publication: IMECE2022-94986

Timofey Dragun - Western New England University
 Seth Mascaro - Western New England University
 Jonathan Blanchard - Western New England University
 Vedang Chauhan - Western New England University



TECHNICAL SESSIONS

MONDAY, OCTOBER 31

11:48AM

Design of Human-Robot Collaborative Workstation for the Packaging of Kitchen Furniture

Technical Paper Publication: IMECE2022-95452

Marianna Ciccarelli - Università Politecnica delle Marche

Simir Moschini - Università Politecnica delle Marche

Matteo Claudio Palpacelli - Università Politecnica delle Marche

Alessandra Papetti - Università Politecnica delle Marche

Michele Germani - Università Politecnica delle Marche

2-1: 7th Annual Conference-Wide Symposium on Additive Manufacturing

02-01-02: 7th Annual Conference-Wide Symposium on Additive Manufacturing: Metals II

2:00PM–3:45PM - CONVENTION CENTER, C151

2:00PM

Dependency Evaluation of Defect Formation and Printing Location in Additive Manufacturing

Technical Paper Publication: IMECE2022-95145

Kosar Safari - University of Connecticut

Shihab Khalfalla - University of Connecticut

Farhad Imani - University of Connecticut

2:21PM

Modeling of Selective Laser Melting (SLM) Process

Technical Presentation: IMECE2022-99707

Anne Munyasia - Tennessee State University

Ayodeji Fawole - Tennessee State University

Abiodun Fasoro - Tennessee State University

Lee Keel - Tennessee State University

2:42PM

Nuclear Irradiation Effects on Inconel 625 and 718 Specimens Fabricated via Laser Powder Bed Fusion

Technical Presentation: IMECE2022-100169

Scott M. Thompson - Kansas State University

Bart Prorok - Auburn University

John Gahl - University of Missouri

Valentina O'Donnell - University of Missouri

Mohanish Andurkar - Kansas State University

Tahmina Keya - Auburn University

3:03PM

Characterization of Defects in Additively Manufactured Materials From Mechanical Properties

Technical Presentation: IMECE2022-100079

Rimah Aridi - University of South Carolina

Sivaji Karna - University of South Carolina

Zhang Tianyu - University of South Carolina

Vincent Dinova - Savannah River

National Laboratory

Timothy Krentz - Savannah River

National Laboratory

Dale Hitchcock - Savannah River

National Laboratory

Lang Yuan - University of South Carolina

Andrew Gross - University of South Carolina

3:24PM

Effect of Heat Treatment on the Oxidation and High Temperature Wear Performance of Alloy Ti-6Al-4V Manufactured by Direct Metal Laser Sintering

Technical Paper Publication: IMECE2022-95392

Ragavanantham Shanmugam - Navajo Technical University

Dhinakaran Veeman - Chennai Institute of Technology

Muthu Shanmugam Mannan - Chennai Institute of Technology

Gopika Kalaiselvan - Chennai Institute of Technology



TECHNICAL SESSIONS

MONDAY, OCTOBER 31

2-2: Measurement Science, Sensors, Non-destructive Evaluation (NDE) and Process Control for Advanced Manufacturing
02-02-02: Session #2: Measurement Science, Sensors, Non-destructive Evaluation (NDE) and Process Control for Advanced Manufacturing
2:00PM–3:45PM - CONVENTION CENTER, D180
2:00PM

Heterogenous Sensing and Bayesian Optimization for Smart Calibration in Additive Manufacturing Process
Technical Paper Publication: IMECE2022-96010
Sean Rescsanski - University of Connecticut
Mahdi Imani - Northeastern University
Farhad Imani - University of Connecticut
2:21PM

Development of the Ultrasonic System Integration With 3D Polymer Printing
Technical Paper Publication: IMECE2022-96028
Jonathan England - New Mexico Institute of Mining and Technology
Ethan Darnell - New Mexico Institute of Mining and Technology
Janak Bhakta - New Mexico Institute of Mining and Technology
Maria D'orazio - New Mexico Institute of Mining and Technology
Mariya Chukovenkova - New Mexico Institute of Mining and Technology
Andrei Zagrai - New Mexico Institute of Mining and Technology
2:42PM

As-Built Mechanical Property Estimation and Control of Laser Powder Bed Fusion SS-316L Parts
Technical Presentation: IMECE2022-96045
Xinyi Xiao - Miami University
3:03PM

Detecting Hidden Defects in Additively Manufactured Parts Using X-Ray Computed Tomography and Computer Vision
Technical Presentation: IMECE2022-96692
Miles V. Bimrose - University of Illinois
Tianxiang Hu - Zhejiang University
Davis J. Mcgregor - University of Illinois
Jiongxin Wang - Zhejiang University
Sameh Tawfick - University of Illinois
Chenhuo Shao - University of Illinois
Zhozhu Liu - Zhejiang University
William P. King - University of Illinois
3:24PM

Build Chamber and Start Plate Variability During Electron Beam Melting Machine Setup
Technical Paper Publication: IMECE2022-96980
Garrett Kelley - University of Washington
Ramulu Mamidala - University of Washington

2-10: Robotics and Automation in Advanced Manufacturing
02-10-02: Session #2: Robotics and Automation in Advanced Manufacturing
2:00PM–3:45PM - CONVENTION CENTER, A220
2:00PM

Autonomous Freeform Fabrication via Robotic Additive Manufacturing
Technical Presentation: IMECE2022-96014
Xinyi Xiao - Miami University
2:21PM

Automated Design of FDM-Printable Snake-Like Compliant Mechanisms With Predefined End Effector Poses


TECHNICAL SESSIONS

MONDAY, OCTOBER 31

Technical Paper Publication: IMECE2022-96568

Simon Schiele - Technical University of Munich
Christoph Rehekampff - Technical University of Munich

Andreas Schroeffler - Technical University of Munich
Laurin Schweigert - Technical University of Munich
Tim C. Lueth - Technical University of Munich

2:42PM**Industrializing Residential Construction Using Artificial Intelligent (AI) Robotics****Technical Paper Publication: IMECE2022-96675**

hussein abaza Abaza - Kennesaw State University
Austin Clark - Kennesaw State University
Aaron Schwartz - Kennesaw State University
Henry Durce - Kennesaw State University
David Guerra-Zubiaga - Kennesaw State University

3:03PM**Reconfigurable Swarm Manufacturing: A Case Study of a Simple Robotic Vehicle****Technical Presentation: IMECE2022-97002**

Rencheng Wu - University of Arkansas
Nahid Tushar - University of Arkansas
Wenchao Zhou - University of Arkansas
Wan Shou - University of Arkansas

3:24PM**Incorporating Human Experts for Development of Agile Trajectory Control Policies for Robotic Material Deposition****Technical Presentation: IMECE2022-99854**

Andrew Gillman - Air Force Research Laboratory
Anesia Auguste - Air Force Research Laboratory
Ezra Ameperosa - Air Force Research Laboratory
Jennifer Ruddock - UES Inc./Air Force Research Laboratory
James Hardin - Air Force Research Laboratory
Erick Braham - Air Force Research Laboratory

2-6: Advanced Material Forming - Mechanics, Characterization, Novel Processes, and Control**02-06-02: Session #2: Advanced Material Forming and Measurement of Advanced Manufacturing Processes****2:00PM–3:45PM - CONVENTION CENTER, D181****2:00PM****Effect of Tool Material and Process Parameters on Surface Conditions in Single Point Incremental Forming (SPIF) of Polymeric Materials****Technical Paper Publication: IMECE2022-95951**

Ihab Ragai - Penn State University Erie
Joe Goldstein - Penn State University
Cayla Meyer - Penn State University
Clayton Upcraft - Penn State University

2:21PM**Electrically Assisted Stamping****Technical Paper Publication: IMECE2022-96916**

Shubham Garde - Clemson University
Ranveer Patil - Clemson University
Tyler Grimm - Clemson University
Laine Mears - Clemson University

2:42PM**Investigation of the Working Envelope in Cup-Drawing of Pure Aluminum****Technical Presentation: IMECE2022-100036**

Kelin Chen - The Ohio State University
Adrian Carter - The Ohio State University
Yannis Korkolis - The Ohio State University

3:03PM**Hybrid Sensing Method for Melt Pool Thermal History Monitoring in Additive Manufacturing by Integrating Co-Axial and Off-Axial IR Imaging Systems**

TECHNICAL SESSIONS

MONDAY, OCTOBER 31

Technical Presentation: IMECE2022-99734*Xiaoyu Chen - University of Louisville**Chenang Liu - Oklahoma State University**Li Yang - University of Louisville***3:24PM****In-Situ Additive Manufacturing Monitoring Using Complementary Metal Oxide Semiconductor (CMOS) Technology****Technical Presentation: IMECE2022-99835***Ayodeji Fawole - Tennessee State University**Anne Munyasia - Tennessee State University**Abiodun Fasoro - Tennessee State University***2-1: 7th Annual Conference-Wide Symposium on Additive Manufacturing****02-01-03: 7th Annual Conference-Wide Symposium on Additive Manufacturing: Polymers I****4:00PM–5:45PM CONVENTION CENTER, C151****4:00PM****Physics-Based Filament Adhesion Modeling in Fused Filament Fabrication****Technical Paper Publication: IMECE2022-96486***Shreyas Aniyambeth - Rutgers University-New Brunswick**Deepak Malekar - Rutgers University-New Brunswick**Tugrul Ozel - Rutgers University***4:21PM****Detecting Defects in Low-Cost FDM 3D Printing****Technical Paper Publication: IMECE2022-96111***Mark Forte - Worcester Polytechnic Institute**Madison Eisenhour - Worcester Polytechnic Institute**Ryan Malkowski - Worcester Polytechnic Institute**Pradeep Radhakrishnan - Worcester Polytechnic Institute**David Brown - Worcester Polytechnic Institute***4:42PM****Investigation on the Mechanical Properties of High-Temperature Polymer (Polyether Ether Ketone-PEEK) With Material Extrusion Additive Manufacturing****Technical Paper Publication: IMECE2022-95419***Md. Rashedul Sarker – University of Indianapolis**Joseph Glassmeyer - University of Indianapolis**Alexander Ruble - University of Indianapolis**Youssef K. Hamidi - University of Houston–Clear Lake**Kazi Md. Masum Billah - University of Houston–Clear Lake***5:03PM****An Experimental Investigation of the Mechanical Behavior of 3D Printed Structures as a Function of Manufacturing Process Decisions****Technical Paper Publication: IMECE2022-95317***Josh Hamel - Seattle University**Logan Kamla - Seattle University***5:24PM****Impact of Processing Parameters in Mechanical Properties of the Additively Manufactured Acrylonitrile Styrene Acrylate****Technical Paper Publication: IMECE2022-95109***Kazi Md. Masum Billah - University of Houston–Clear Lake**Md Rashedul Sarker - University of Indianapolis**Mario Barron Gonzalez - University of Houston–Clear Lake**Jose Anibal Ramirez - University of Houston–Clear Lake**Youssef K. Hamidi - University of Houston–Clear Lake***2-5: 7th Symposium on Fastening and Joining Research and Advanced Technology****02-05-01: Session #1: 7th Symposium on Fastening and Joining Research and Advanced Technology**

TECHNICAL SESSIONS

MONDAY, OCTOBER 31

4:00PM–5:45PM - CONVENTION CENTER, A220

4:00PM

Effect of Autoclave Cure Temperature and Pressure on Adhesive Glass Transition Temperature and Degree of Cure of Film Adhesive Joints

Technical Paper Publication: IMECE2022-94434

Sayed Nassar - Oakland University

Shraddha Jagatap - Oakland University

Nitesh Hirulkar - Oakland University

4:21PM

Effect of Salt Spray Cyclic Corrosion on the Mechanical and Reversibility Performance of Mixed Material Joints With Modified Adhesive

Technical Paper Publication: IMECE2022-94447

Matthew Burczyk - Oakland University

Sayed Nassar - Oakland University

4:42PM

2-D Analytical Model of Heat and Moisture Diffusion in Bonded Single Lap Joints

Technical Paper Publication: IMECE2022-95201

Marco Gerini-Romagnoli - Oakland University

Sayed Nassar - Oakland University

5:03PM

Effect of Using 3D Printed Parts on the Torque-Tension Relationship and Vibration Loosening Performance of Threaded Joints

Technical Paper Publication: IMECE2022-95614

Francesco Robusto - University of Bologna

Sayed Nassar - Oakland University

Joon Ha Lee - Hyundai Motor Company

Marco Gerini-Romagnoli - Oakland University

Massimiliano De Agostinis - Università di Bologna

5:24PM

Analytical and Computational Modeling of FRP-Metal Joints Made by Ultrasonic Additive Manufacturing

Technical Paper Publication: IMECE2022-96827

Ningxiner Zhao - The Ohio State University

Hongqi Guo - The Ohio State University

Leon Headings - The Ohio State University

Marcelo Dapino - The Ohio State University

2-16: Manufacturing: General

02-16-01: Manufacturing: General

4:00PM–5:45PM - CONVENTION CENTER, D181

4:00PM

Numerical and Experimental Investigations of Rheodrop Technology

Technical Paper Publication: IMECE2022-94952

Khalid Alqosaibi - Lehigh University

Mohammed Alemmrani - Lehigh University

Ahmed Almalki - Lehigh University

Alaa Duhduh - Lehigh University

John Coulter - Lehigh University

4:21PM

Performance Evaluation of Conveyor-Less Matrix Assembly System Using Simulation and Mathematical Models

Technical Paper Publication: IMECE2022-94996

Min-Soo Kim - Korea Advanced Institute of Science and Technology

Eun Hyo Chang - Korea Advanced Institute of Science and Technology



TECHNICAL SESSIONS

MONDAY, OCTOBER 31

Seog-Chan Oh - General Motors R&D
 James W. Wells - General Motors R&D
 Jorge Arinez - General Motors R&D
 Young Jae Jang - Korea Advanced Institute of Science and Technology

4:42PM

Derivation of the Exact Curvature Formulation for Gothic Arch Ball Screw Grooves

Technical Paper Publication: IMECE2022-95746

Antonio C. Bertolino - Politecnico di Torino
 Andrea De Martin - Politecnico di Torino
 Stefano Mauro - Politecnico di Torino
 Massimo Sorli - Politecnico di Torino

5:03PM

Damaged Apple Detection Using Artificial Intelligence

Technical Paper Publication: IMECE2022-96162

Sathish Kumar Gurupatham - Kennesaw State University
 Caleb Bailey - Kennesaw State University

5:24PM

A Review of the Design and Implementation of Digital Twins for Smart Manufacturing

Technical Paper Publication: IMECE2022-97113

Shafahat Ali - Rochester Institute of Technology of Dubai
 Said Abdallah - Rochester Institute of Technology of Dubai
 Salman Pervaiz - Rochester Institute of Technology of Dubai

2-15: Sustainable Manufacturing Systems
02-15-01: Sustainable Manufacturing Systems
4:00PM–5:45PM - CONVENTION CENTER, D180

4:00PM

Cradle-to-Gate Life Cycle Analysis of Origami-Based Sheet Metal for Automobile Parts

Technical Paper Publication: IMECE2022-96922

Anwar Al-Gamal - The University of Toledo
 Muhammad Ali Ablat - University of California, Merced
 Lakshmi Ramineni - The University of Toledo
 Majed Ali - The University of Toledo
 Abdalmageed Almotari - The University of Toledo
 Ala'aldin Alafaghani - University of California, Merced
 Jian-Qiao Sun - University of California, Merced
 Ala Qattawi - The University of Toledo

4:21PM

Investigating the Tribological Aspects of Tool Wear Mechanism and Tool Life in Sustainable Lubri-Cooling Face Milling Process of Particle Reinforced SiCp/Al Metal Matrix Composites

Technical Paper Publication: IMECE2022-95183

Rashid Ali Laghari - King Fahd University of Petroleum and Minerals
 Samir Mekid - King Fahd University of Petroleum and Minerals
 Syed Sohail Akhtar - King Fahd University of Petroleum and Minerals

4:42PM

Sustainable Foam Manufacture Using Carbon Dioxide

Technical Paper Publication: IMECE2022-95956

Kayode Oluwabunmi - University of North Texas
 Nandika Anne D'Souza - University of North Texas
 Weihuan Zhao - University of North Texas



TECHNICAL SESSIONS

MONDAY, OCTOBER 31 – TUESDAY, NOVEMBER 1

5:03PM

Dry Sliding Wear Behavior of Electron Beam Melted (EBM) Ti-6Al-4V**Technical Paper Publication: IMECE2022-94735***Mohammad Sayem Bin Abdullah - University of Washington**Ramulu Mamidala - University of Washington*

5:24PM

Optimization of Design Parameters for Large Diameter N07718 Hex Bolts in Hot Forging Using Finite Element Analysis**Technical Paper Publication: IMECE2022-96919***Carl Upchurch - U.S. Bolt Manufacturing, Inc.**Xiaobo Peng - Prairie View A&M University**Lai Jiang - Prairie View A&M University**Jaejong Park - Prairie View A&M University***2-1: 7th Annual Conference-Wide Symposium on Additive Manufacturing****02-01-04: 7th Annual Conference-Wide Symposium on Additive Manufacturing: Polymers II**

10:15AM–12:00PM - CONVENTION CENTER, D181

10:15AM

Modeling the Interplay Between Process Parameters and Part Attributes in Additive Manufacturing Process With Artificial Neural Network**Technical Paper Publication: IMECE2022-95120***Jayanta Deb - Western Carolina University**Nazmul Ahsan - Western Carolina University**Sharmin Majumder - Texas A&M University*

10:36AM

Toolpath Planning With Thermal Stress Awareness for Material Extrusion Additive Manufacturing**Technical Paper Publication: IMECE2022-94341***Jayant Khatkar - University of Technology Sydney**Lee Clemon - University of Technology Sydney**Ramgopal Mettu - Tulane University*

10:57AM

Quality Control Study on 3d Printed Parts**Technical Paper Publication: IMECE2022-90251***Brandon Jackson - Widener University**Kamran Fouladi - Widener University**Babak Eslami - Widener University*

11:18AM

Induced Anisotropy in the Fracturing Behavior of 3D Printed Parts Analyzed by the Size Effect Method**Technical Presentation: IMECE2022-99462***Kedar Kirane - Stony Brook University**Anar Nurizada - Stony Brook University*

11:39AM

Multiscale Modeling of Elasticity and Fracture in Additively Manufactured Polymers**Technical Presentation: IMECE2022-99393***Jun Li - University of Massachusetts Dartmouth***2-3: Nanomanufacturing: Novel Processes, Applications, and Process-Property Relationships****02-03-01: Session #1: Nanomanufacturing: Novel Processes, Applications, and Process-Property Relationships**

10:15AM

Surfing Scanning Probe Lithography at Meters per Second**IMECE**[®]**ONE GREAT LEARNING EXPERIENCE.**
INTERNATIONAL MECHANICAL ENGINEERING
CONGRESS & EXPOSITION[®]

TECHNICAL SESSIONS

TUESDAY, NOVEMBER 1

Technical Presentation: IMECE2022-99524*Bojing Yao - Purdue University**Qian Qian - Purdue University**Chen Chen - Purdue University**Zhidong Du - Purdue University**Liang Pan - Purdue University***10:36AM****Laser Photothermal Generation of 3D Graphene With Multifunctionality****Technical Presentation: IMECE2022-99238***Pilgyu Kang - George Mason University**Byoung Gak Kim - Korea Research Institute of Chemical Technology**Minsu Kim - Korea Research Institute of Chemical Technology**Seung Min Lee - George Mason University**Shirin Movaghgharnezhad - George Mason University***10:57AM****Fast, Continuous, Projection Multi-Photon 3D Printing****Technical Presentation: IMECE2022-99494***Jason Johnson - Purdue University**Paul Somers - Purdue University**Zihao Liang - Purdue University**Gavin Noel - Purdue University**Bryan Boudouris - Purdue University**Liang Pan - Purdue University**Xianfan Xu - Purdue University***11:18AM****Photoinduced Additive Manufacturing of Metal at Micro/Nanoscale****Technical Presentation: IMECE2022-99470***Chinmoy Podder - Texas A&M University**Heng Pan - Texas A&M University***11:39AM****Towards Secured Process Data Sharing of Metal-Based Additive Manufacturing for Cross-System Part Certification****Technical Presentation: IMECE2022-99969***Wenmeng Tian - Mississippi State University***02-07-01: Session #1: Innovative Product and Process Design****10:15AM–12:00PM - CONVENTION CENTER, D183****10:15AM****Multiscale Homogenization for Structure-Property Linkage Modeling in Design for Additive Manufacturing of Cellular Structure****Technical Presentation: IMECE2022-88462***Phong Nguyen - University of Virginia**Youngdoo Kim - Chung-Ang University**Young Choi - Chung-Ang University**Stephen Baek - University of Virginia***10:36AM****Design and Implement an Additive Manufacturing Injection Mold****Technical Paper Publication: IMECE2022-88593***Basel Alsayyed - Western Carolina University**Nicholas Foland - Western Carolina University***10:57AM****Domain Segmentation Optimization of Multiple Anisotropic Materials With Varying Orientation Angles Using a Topology Optimization Based on the Extended Level Set Method****Technical Paper Publication: IMECE2022-94041***Masaki Noda - The University of Tokyo**Kei Matsushima - The University of Tokyo**Yuki Noguchi - The University of Tokyo**Takayuki Yamada - The University of Tokyo*

TECHNICAL SESSIONS

TUESDAY, NOVEMBER 1

11:18AM**A Deep Learning Approach for Topology Optimization to Enhance Structural Design****Technical Presentation: IMECE2022-94082***Negin Moghadasi - University of Virginia**Phong C.H. Nguyen - University of Virginia**Stephen Baek - University of Virginia***11:39AM****A Novel Physics-Aware AI-Assisted Framework for Microstructural Design of Shocked Materials****Technical Presentation: IMECE2022-94154***Joseph Choi - University of Virginia**Phong Nguyen - University of Virginia**Yen-Thi Nguyen - University of Iowa**H.S. Udaykumar - The University of Iowa**Stephen Baek - University of Virginia***2-1: 7th Annual Conference-Wide Symposium on Additive Manufacturing****02-01-05: 7th Annual Conference-Wide Symposium on Additive Manufacturing: Unique Applications I****1:30PM–3:15PM - CONVENTION CENTER, D181****1:30PM****Rapid and Low-Cost Fabrication of Microfluidic Devices Using Liquid Crystal Display-Based 3D Printing****Technical Paper Publication: IMECE2022-96036***Yujie Shan - Purdue University**Praveen Sahu - Purdue University**Raji Sundararajan - Purdue University**Huachao Mao - Purdue University***1:51PM****3D Printing Diffraction Gratings and Fresnel Axicons****Technical Paper Publication: IMECE2022-95889***Junyu Hua - Purdue University**Yujie Shan - Purdue University**Huachao Mao - Purdue University***2:12PM****Autonomous Knowledge Discovery and Process Planning of Aerosol Jet Printing Enabled by Hybrid Machine Learning Methods****Technical Presentation: IMECE2022-99996***Yipu Du - University of Notre Dame**Yanliang Zhang - University of Notre Dame**Meng Jiang - University of Notre Dame***2:33PM****Hybrid Additive Manufacturing for Sustainable Energy and Sensor Systems****Technical Presentation: IMECE2022-99930***Yanliang Zhang - University of Notre Dame***2:54PM****Simultaneous Acoustic and Mechanical Energy Absorption via 3D Printed Fibrous TPMS Structures****Technical Presentation: IMECE2022-99671***William Johnston - Wichita State University**Janith Godakawela - Wichita State University**Carlos Gatti - Wichita State University**Bhisham Sharma - Wichita State University**Suresh Keshavanarayana - Wichita State University***2-3: Nanomanufacturing: Novel Processes, Applications, and Process-Property Relationships****02-03-02: Session #2: Nanomanufacturing: Novel Processes, Applications, and Process-Property Relationships**

TECHNICAL SESSIONS

TUESDAY, NOVEMBER 1

1:30PM–3:15PM - CONVENTION CENTER, D182

1:30PM

Atmospheric-Pressure Flame Vapor Deposition of Nanocrystalline Diamonds**Technical Presentation: IMECE2022-99555***Adrian Manjarrez - University of Illinois at Urbana-Champaign**Kai Zhou - University of Illinois at Urbana-Champaign**Changqiang Chen - University of Illinois at Urbana-Champaign**Yan-Kai Tzeng - Stanford University**Lili Cai - University of Illinois at Urbana-Champaign*

1:51PM

Durable Metallization of Resin Surfaces via Sacrificial Nanotransfer Lithography**Technical Presentation: IMECE2022-99879***Bryan Llumiquirega - Rutgers University**Luke Eidle - Rutgers University**Ishaan Dey - Rutgers University**Jonathan P. Singer - Rutgers University**Robert Green-Warren - Rutgers University*

2:12PM

Experimental Investigations on the Robustness of Bulk Metallic Glass-Based Tooling for Microinjection Molding**Technical Paper Publication: IMECE2022-94888***Ahmed Almalki - Lehigh University**Ali Rajhi - King Khalid University**Hussam Noor - Taibah University**Animesh Kundu - Lehigh University**John Coulter - Lehigh University*

2:33PM

Macropore-Infused Nanocomposite Emulsion Thermosets for Multifunctional Carbon Fiber Composites**Technical Presentation: IMECE2022-99690***Yogin Patel - Rutgers University**Rituparna Mohanty - Rutgers University**Charm Nicholas - Rutgers University**Jonathan Singer - Rutgers University*

2:54PM

The Use of Low-Code During a Skill Shortage**Technical Paper Publication IMECE2022-95505***Aaron Büscher - Bochum University of Applied Sciences**Daniel Schilberg - Hochschule Bochum**Lars Wiegert - Vitesco Technologies***2-7: Innovative Product and Process Design****02-07-02: Session #2: Innovative Product and Process Design**

1:30PM–3:15PM - CONVENTION CENTER, D183

1:30PM

Topology Optimization for Acoustic Structures Without Floating Components**Technical Paper Publication: IMECE2022-94365***Yuki Noguchi - The University of Tokyo**Yusei Ohta - The University of Tokyo**Kei Matsushima - The University of Tokyo**Takayuki Yamada - The University of Tokyo*

1:51PM

Analysis of Shark Fluid Dynamics to Guide Satellite Telemetry Tag Development**Technical Paper Publication: IMECE2022-94838***Munir Zarea - Oregon State University**Evan Brown - Oregon State University**Allen George - Oregon State University**Joshua Kozsey - Oregon State University**Tyler Palmgren - Oregon State University*

TECHNICAL SESSIONS

TUESDAY, NOVEMBER 1

Meng-Chien Wu - Oregon State University
 Sarah Oman - Oregon State University
 John Parmigiani - Oregon State University
 Joseph Piacenza - Oregon State University
 Susan Piacenza - Oregon State University

2:12PM

3D Model Search and Retrieval for Am Designs

Technical Presentation: IMECE2022-96080
 Xinyi Xiao - Miami University

2:33PM

Thin Steel Plate Surface Rust Recognition Using Processing Light Measurement for Reduction of Laser Cutting Defect False Recognition

Technical Paper Publication: IMECE2022-96166
 Mizuki Ishiguro - The University of Tokyo
 Shin'ichi Warisawa - The University of Tokyo
 Naoyasu Narita - Amada Co., Ltd.
 Hironobu Miyoshi - Amada Co., Ltd.
 Rui Fukui - The University of Tokyo

2:54PM

A Numerical Investigation to Compare Point Cloud and STL Based Toolpath Strategies for Five-Axis Incremental Sheet Forming

Technical Paper Publication: IMECE2022-94589
 Ayushi Gupta - Indian Institute of Information Technology, Design and Manufacturing
 Aniket Nagargoje - Indian Institute of Information Technology, Design and Manufacturing
 Abhay Kumar Dubey - Indian Institute of Information Technology, Design and Manufacturing
 Puneet Tandon - Indian Institute of Information Technology, Design and Manufacturing

2-1: 7th Annual Conference-Wide Symposium on Additive Manufacturing

02-01-06: 7th Annual Conference-Wide Symposium on Additive Manufacturing: Unique Applications II

3:30PM–5:15PM - CONVENTION CENTER, D181

3:30PM

Direct Ink Writing of ZnO: Interparticle Force Measurements via AFM

Invited Presentation: IMECE2022-99884
 Brian Bush - National Institute of Standards and Technology
 Russell Maier - National Institute of Standards and Technology
 Abhay Goyal - National Institute of Standards and Technology

4:12PMPM

Additive Manufacturing of Embedded Strain Sensors in Structural Composites

Technical Paper Publication: IMECE2022-94366
 Dongfang Zhao - University of Oklahoma
 Jacob Meves - University of Oklahoma
 Anirban Mondal - University of Oklahoma
 Mrinal Saha - University of Oklahoma
 Yingtao Liu - University of Oklahoma

4:33PM

3D Printed and Foamed Triply Periodic Minimal Surface Lattice Structures for Energy Absorption Applications in Engineering Industry

Technical Presentation: IMECE2022-99266
 Dylan Weber - Fairfield University
 Sriharsha Sundarram - Fairfield University



TECHNICAL SESSIONS

TUESDAY, NOVEMBER 1

4:54PM**Novel Multi-Material Additively Manufactured Energy Absorptive Tensegrity Structures****Technical Presentation: IMECE2022-99926***Justin Marino - The University of Texas at Arlington**Layth Ahmad - The University of Texas at Arlington**Lauren Hutchison - The University of Texas at Arlington**Ashfaq Adnan - The University of Texas at Arlington***2-4: Advanced Machining and Finishing Processes****02-04-01: Session #1: Advanced Machining and Finishing Processes****3:30PM–5:15PM - CONVENTION CENTER, D182****3:30PM****A Study on New 5-Axis Turning Method for Non-Axisymmetric 3D Surfaces****Technical Paper Publication: IMECE2022-94885***Narimasa Ueda - Kanazawa Institute of Technology**Akane Ishizuka - Kanazawa Institute of Technology**Yoshitaka Morimoto - Kanazawa Institute of Technology**Akio Hayashi - Kanazawa Institute of Technology**Yoshiyuki Kaneko - Takamatsu Machinery Co., Ltd.**Naohiko Suzuki - Takamatsu Machinery Co., Ltd.***3:51PM****Material Removal Characteristics of Longitudinal Turning of Green Ceramics****Technical Paper Publication: IMECE2022-95037***Jesse Castellana - Georgia Institute of Technology**Shreyes Melkote - Georgia Institute of Technology***4:12PM****Modeling and Simulation of Chip-Flow in Grinding for Different Materials - AlMg5 and C45****Technical Paper Publication: IMECE2022-95233***Wolfgang Lortz - University of Applied Sciences, Schneidershof**Radu Pavel - Techsolve, Inc.***4:33PM****Application of Nickel Deposition on Electropolishing (EP), Chempolishing (CP), and As-Built Additively Manufactured Metal Components****Technical Paper Publication: IMECE2022-96200***Pablo Sanchez - University of the District of Columbia**Zafar Waqar - University of the District of Columbia**Pawan Tyagi - University of the District of Columbia***4:54PM****A Study on New 5-Axis Turning Method for Non-Axisymmetric 3D Surfaces****Technical Presentation: IMECE2022-98919***Narimasa Ueda - Kanazawa Institute of Technology**Akane Ishizuka - Kanazawa Institute of Technology**Yoshitaka Morimoto - Kanazawa Institute of Technology**Akio Hayashi - Kanazawa Institute of Technology**Yoshiyuki Kaneko - Takamatsu Machinery Co., Ltd.**Naohiko Suzuki - Takamatsu Machinery Co., Ltd.***2-14: 3D/4D BioManufacturing & BioMaterials****02-14-01: 3D/4D BioManufacturing, BioMaterials, & Computational Modeling****3:30PM–5:15PM - CONVENTION CENTER, D183**

TECHNICAL SESSIONS TUESDAY, NOVEMBER 1 & WEDNESDAY, NOVEMBER 2**3:30PM**

Investigation of the Effects of Photopolymer Resin Composition on the Mechanical Properties of Complex Dental Constructs, Fabricated Using Digital Light Processing

Technical Paper Publication: IMECE2022-95049

Regan Raines - Marshall University

Roozbeh (Ross) Salary - Marshall University

3:51PM

A Bio-Printing Strategy to Fabricate Geometrically Accurate 3D Scaffolds

Technical Paper Publication: IMECE2022-95300

Connor Quigley - Keene State College

Slesha Tuladhar - Keene State College

Md. Ahasan Habib - Keene State College

4:12PM

Formation Mechanism of Holey Graphene/graphene Oxide in Laser Heated Graphene Oxide-Hydrogen Peroxide Solution From Deep Neural Network Interatomic Potential

Technical Presentation: IMECE2022-100178

Iyyappa Rajan Panneerselvam - University of Nevada, Reno

Yan Wang - University of Nevada, Reno

4:33PM

Numerical Study of Shape Distortions and Residual Stresses in 3D Printed Components for Knee Replacements

Technical Presentation: IMECE2022-100252

Osama Aljarrah - Youngstown State University

Stephanie Decarvalho - University of Massachusetts Dartmouth

Jun Li - University of Massachusetts Dartmouth

4:54PM

An Image-Based Convolutional Neural Network Platform for the Prediction of the Porosity of Composite Bone Scaffolds, Fabricated Using Material Extrusion Additive Manufacturing

Technical Paper Publication: IMECE2022-95044

Josh Blatt - Marshall University

Jacob Kirkendoll - Marshall University

Paavana Krishna Mandava - Marshall University

Zachary Preston - Marshall University

Robert Joyce - FibreTuff Company

Roozbeh (Ross) Salary - Marshall University

WEDNESDAY, NOVEMBER 2

2-1: 7th Annual Conference-Wide Symposium on Additive Manufacturing

02-01-07: 7th Annual Conference-Wide Symposium on Additive Manufacturing: Composites/Ceramics

10:45AM–12:30PM - CONVENTION CENTER, D181

10:45AM

Ceramic Binder Jetting Additive Manufacturing

Invited Presentation: IMECE2022-99778

Chao Ma - Texas A&M University

Zhijian Pei - Texas A&M University

11:27AM

The Impact of the Printed Part Geometry on the Shrinkage and Porosity Percentage in Binder Jetting Additive Manufacturing of Ceramics Powder



TECHNICAL SESSIONS

WEDNESDAY, NOVEMBER 2

Technical Paper Publication: IMECE2022-96385

Suleiman Obeidat - Sam Houston State University
Junkun Ma - Sam Houston State University
Sophie Himelstein - Sam Houston State University
Aniruddha Acharya - Sam Houston State University

11:48AM**Stereolithography Printing and Sintering of Silicon Carbide (SiC) Ceramics via Oxidation-Bonding****Technical Paper Publication: IMECE2022-96009**

Padmalatha Kakanuru - Stevens Institute of Technology
Kishore Pochiraju - Stevens Institute of Technology

12:09PM**Experimental and Statistical Optimization of Nylon-Carbon Fiber Reinforced Composite Based 3D Printed Cellular Structures****Technical Paper Publication: IMECE2022-95727**

Ahmad Hisham - Rochester Institute of Technology of Dubai
Shafahat Ali - Rochester Institute of Technology of Dubai
Said Abdallah - Rochester Institute of Technology of Dubai
Abdallah Nassir Abdo Mohammed - Dubai Electricity & Water Authority
Rahmat Agung Susantyoko - Dubai Electricity & Water Authority
Salman Pervaiz - Rochester Institute of Technology of Dubai

2-8: Computational Modeling and Simulation for Advanced Manufacturing**02-08-01: Session #1: Computational Modeling and Simulation for Advanced Manufacturing****2:00PM–3:45PM CONVENTION CENTER, D181****2:00PM****A Physics-Based Computational Model for the Cold Spray Deposition of Composite Coatings****Technical Paper Publication: IMECE2022-92144**

Abba Abubakar - King Fahd University of Petroleum and Minerals
Abul Fazal M. Arif - McMaster University
Syed Sohail Akhtar - King Fahd University of Petroleum and Minerals
Khaled Al-Athel - King Fahd University of Petroleum and Minerals

2:21PM**Analysis of 3D Printing Performance Using Machine Learning Techniques****Technical Paper Publication: IMECE2022-94000**

Kantu Thomas Kabengele - University of Johannesburg
Lagouge Tartibu - University of Johannesburg
Isaac Oyeyemi Olayode - University of Johannesburg

2:42PM**A Closed-Loop Machine Learning and Compensation Framework for Geometric Accuracy Control of 3D Printed Products****Technical Presentation: IMECE2022-94030**

Wenbin Zhu - Purdue University
Arman Sabbaghi - Purdue University

3:03PM**An Artificial Neural Network for Parametric Analysis of Metallic Additive Manufacturing Using Discrete Element Method****Technical Paper Publication: IMECE2022-95117**

Yuxuan Wu - Embry-Riddle Aeronautical University
Sirish Namilae - Embry-Riddle Aeronautical University



TECHNICAL SESSIONS

WEDNESDAY, NOVEMBER 2

3:24PM

Sustainable Production of Rotationally Symmetrical Components: Approaches to Resource Saving on Tool and Workpiece

Technical Paper Publication: IMECE2022-95378

*Pascal Volke - Technische Universität Dortmund
Gabriel Brock - Technische Universität Dortmund
Sebastian Berger - Technische Universität Dortmund
Jannis Saelzer - Technische Universität Dortmund
Jan Nickel - Technische Universität Dortmund
Dirk Biermann - Technische Universität Dortmund*

2-8: Computational Modeling and Simulation for Advanced Manufacturing

02-08-02: Session #2: Computational Modeling and Simulation for Advanced Manufacturing

4:00PM–5:45PM - CONVENTION CENTER, D181

4:00PM

Parametric Analysis of ANFIS, ANFIS-PSO, and ANFIS-GA Models for the Prediction of Aluminum Surface Roughness in End-Milling Operation

Technical Paper Publication: IMECE2022-95418

*Serge Balonji - University of Johannesburg
Imhade Princess Okokpujie - University of Johannesburg
Lagouge Tartibu - University of Johannesburg*

4:21PM

Atomistic Study on the Cooling Rate Induced Microstructure Evolution of Additively Manufactured Inconel-718

Technical Paper Publication: IMECE2022-95686

*Mohammad Motalab - Bangladesh University of Engineering and Technology
Abrar Faiyad - Bangladesh University of Engineering and Technology
Sourav Saha - Northwestern University
Shiddharta Paul - University of Alabama
Anshu Raj - Bangladesh University of Engineering and Technology*

4:42PM

Analyses and Design of Self-Heating Molds for Windmill Blade Using Large-Scale Additive Manufacturing

Technical Paper Publication: IMECE2022-95790

*Deepak Kumar Pokkalla - Oak Ridge National Laboratory
Ahmed Arabi Hassen - Oak Ridge National Laboratory
Jesse Heineman - Oak Ridge National Laboratory
Thomas Snape - University of Maine
John Arimond - University of Maine
Vlastimil Kunc - Oak Ridge National Laboratory
Seokpum Kim - Oak Ridge National Laboratory*

5:03PM

2D Simulation of the Placement of a Pin-Through-Hole Component and Solder Paste Melting

Technical Paper Publication: IMECE2022-95960

*Nelson Rodrigues - Universidade do Minho
Inês Teixeira - Universidade do Minho
Violeta Carvalho - Universidade do Minho
Duarte Santos - Bosch Car Multimédia
João Velosa - Bosch Car Multimédia
Ana Ferreira - Universidade do Minho
Delfim Soares - Universidade do Minho
José Teixeira - Universidade do Minho
Senhorinha Teixeira - Universidade do Minho*



TECHNICAL SESSIONS

WEDNESDAY, NOVEMBER 2

5:24PM

Latent Representation and Characterization of Scanning Strategy on Laser Powder Bed Fusion Additive Manufacturing

Technical Paper Publication: IMECE2022-96019

Farhad Imani - University of Connecticut

Ruimin Chen - University of Connecticut

4:42PM

A Methodology for Digital Twins of Product Lifecycle Supported by Digital Thread

Technical Paper Publication: IMECE2022-95182

Laetitia Monnier - National Institute of Standards and Technology

Guodong Shao - National Institute of Standards and Technology

Sebti Foufou - University of Burgundy

5:03PM

Industry 4.0 Trends in Intelligent Manufacturing Automation Exploring Machine Learning

Technical Paper Publication: IMECE2022-96092

William Hoover - Kennesaw State University

David Guerra-Zubiaga - Kennesaw State University

Jeremy Banta - Kennesaw State University

Kevin Wandene - Kennesaw State University

Kaleb Key - Kennesaw State University

Germanico Gonzalez-Badillo - Universidad Autónoma de San Luis Potosí

2-12: Digital Manufacturing Process Simulation and Validation

02-12-01: Session #1: Digital Manufacturing Process Simulation and Validation

4:00PM–5:45PM - CONVENTION CENTER, D180

Session Chair: David Guerra-Zubiaga - Kennesaw State University

Session Co-Chair: Muhammad Jahan - Miami University

Session Co-Chair: Vladimir Kuts - Tallinn University of Technology

Session Co-Chair: Murat Aksu - The National Institute of Standards and Technology

4:00PM

SMA-Based Haptic Gloves Usage in the Smart Factory Concept

Invited Presentation: IMECE2022-94305

Rupal Srivastava - Technological University of the Shannon: Midlands Midwest

Vladimir Kuts - University of Limerick

Eber Lawrence Souza Gouveia - Technological University of the Shannon: Midlands Midwest

Niall Murray - Technological University of the Shannon: Midlands Midwest

Declan Devine - Technological University of the Shannon: Midlands Midwest

Eoin O'Connell - University of Limerick



TECHNICAL SESSIONS

THURSDAY, NOVEMBER 3

Track 2: Advanced Manufacturing

Thursday, November 3, 9:15AM-10:00AM

Room: A210/A211

Greater Columbus Convention Center

Title: Next Generation Digital Manufacturing Operations – Democratizing Advanced Manufacturing*Thomas R. Kurfess, Ph.D., P.E.**Georgia Institute of Technology***2-8: Computational Modeling and Simulation for Advanced Manufacturing****02-08-03: Session #3: Computational Modeling and Simulation for Advanced Manufacturing****10:15AM–12:00PM - CONVENTION CENTER, C151****10:15AM****A Proof-of-Concept Study of a Magnetorheological Micropump****Technical Paper Publication: IMECE2022-96174***Sevki Cesmecı - Georgia Southern University**Rubayet Hassan - Georgia Southern University**Mark Thompson - Georgia Southern University***10:36AM****Novel Digital Twin Concept for Industrial Applications. Study Case: Propulsion Drive System****Technical Paper Publication: IMECE2022-97243***Sergei Jegorov - Tallinn University of Technology**Anton Rassõlkin - Tallinn University of Technology**Viktor Rjabtšikov - Tallinn University of Technology**Mahmoud Ibrahim - Tallinn University of Technology**Vladimir Kuts - University of Limerick***10:57AM****Numerical Modeling of Additive Manufacturing of Thermoset Polymers Using Frontal Polymerization****Technical Presentation: IMECE2022-98952***Michael Zakoworotny - University of Illinois at Urbana-Champaign**Javier Balta - University of Illinois at Urbana-Champaign**Aditya Kumar - University of Illinois at Urbana-Champaign**Jia En Aw - University of Illinois at Urbana-Champaign**Nil Parikh - University of Illinois at Urbana-Champaign**Sameh Tawfick - University of Illinois at Urbana-Champaign**Randy Ewoldt - University of Illinois at Urbana-Champaign**Nancy Sottos - University of Illinois at Urbana-Champaign**Philippe Geubelle - University of Illinois at Urbana-Champaign***2-9: Variation Simulation and Design for Assembly****02-09-01: Session #1: Variation Simulation and Design for Assembly Description****10:15AM–12:00PM - CONVENTION CENTER, D180****10:15AM****Coupling Sampling-Based Tolerance-Cost Optimization and Selective Assembly: An Integrated Approach for Optimal Tolerance Allocation****Technical Paper Publication: IMECE2022-88775***Martin Roth - Friedrich-Alexander-Universität Erlangen-Nürnberg**Markus Johannes Seitz - Friedrich-Alexander-Universität Erlangen-Nürnberg**Benjamin Schleich - Friedrich-Alexander-Universität Erlangen-Nürnberg**Sandro Wartzack - Friedrich-Alexander-Universität Erlangen-Nürnberg*

TECHNICAL SESSIONS

THURSDAY, NOVEMBER 3

10:36AM**A Model-Based Approach for Integrated Variation Management****Technical Paper Publication: IMECE2022-90956***Dennis Horber - Friedrich-Alexander-Universität Erlangen-Nürnberg**Stefan Götz - Friedrich-Alexander-Universität Erlangen-Nürnberg**Benjamin Schleich - Friedrich-Alexander-Universität Erlangen-Nürnberg**Sandro Wartzack - Friedrich-Alexander-Universität Erlangen-Nürnberg***10:57AM****A Theoretic Error Modeling Method for the Robotic Optical Sensing System With a 3D Laser Scanner****Technical Paper Publication: IMECE2022-94705**
*Wenzheng Zhao - University of Shanghai for Science and Technology**Yanzheng Li - University of Shanghai for Science and Technology**Yinhua Liu - University of Shanghai for Science and Technology***11:18AM****A Hierarchical Approach for the Verification and Validation of Tolerance Analysis Models****Invited Presentation: IMECE2022-91890***Paul Schaechtl - Friedrich-Alexander-Universität Erlangen-Nürnberg**Benjamin Schleich - Friedrich-Alexander-Universität Erlangen-Nürnberg**Sandro Wartzack - Friedrich-Alexander-Universität Erlangen-Nürnberg***2-11: Laser-Based Advanced Manufacturing and Materials Processing****02-11-01: Session #1: Laser-Based Advanced Manufacturing and Materials Processing****10:15AM–12:00PM - CONVENTION CENTER, D181****10:15AM****Laser Photothermal Production of 3d Graphene With Polymers****Technical Presentation: IMECE2022-88420***Pilgyu Kang - George Mason University**Byoung Gak Kim - Korea Research Institute of Chemical Technology**Minsu Kim - Korea Research Institute of Chemical Technology**Seung Min Lee - George Mason University**Shirin Movaghgharnezhad - George Mason University***10:36AM****Laser-Generated Porous Graphene Photodetector With Broadband and Ultrahigh Sensitivity****Technical Presentation: IMECE2022-93724***Shirin Movaghgharnezhad - George Mason University**Minsu Kim - Korea Research Institute of Chemical Technology**Hyojin Kim - Korea Research Institute of Chemical Technology**Byoung Gak Kim - Korea Research Institute of Chemical Technology**Pilgyu Kang - George Mason University***10:57AM****Nanosecond Laser Modification of Nickel-Titanium Based Shape Memory Alloys**

TECHNICAL SESSIONS

THURSDAY, NOVEMBER 3

Technical Paper Publication: IMECE2022-95292*Jianfeng Ma - Saint Louis University**Mahmud Karim - Miami University**Muhammud Jahan - Miami University**Sally Shim - Saint Louis University**Shuting Lei - Kansas State University***11:18AM****Laser Photothermal Nano-Assembly of 3D Porous Graphene and Palladium Nanoparticles for Wireless, Flexible, High-Sensitive Hydrogen Detection****Technical Presentation: IMECE2022-95922***Seung Min Lee - George Mason University***11:39AM****Dual-Step Sintering of Cu Nanoparticles With Femtosecond Laser****Technical Presentation: IMECE2022-98034***Janghan Park - The University of Texas at Austin**Yaguo Wang - The University of Texas at Austin***2-8: Computational Modeling and Simulation for Advanced Manufacturing****02-08-04: Session #4: Computational Modeling and Simulation for Advanced Manufacturing****2:00PM–3:45PM - CONVENTION CENTER, C151****2:00PM****Three-Dimensional Phase-Field Simulation of γ " Precipitation Kinetics in Inconel 625 During Heat Treatment****Technical Presentation: IMECE2022-98972***Yucheng Liu - South Dakota State University***2:21PM****Process Modeling and Optimization of Flash-Cure Manufacturing of Thermoset Composites****Technical Presentation: IMECE2022-99303***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***2:42PM****Simulation of Multi-Pass Hot Rolling and QST Process via Integrated Finite Element and Cellular Automata Model****Technical Presentation: IMECE2022-99475***Seojun Hong - Seoul National University**Seo Yeon Jo - Seoul National University**Myoung-Gyu Lee - Seoul National University***3:03PM****Molecular Dynamic Simulation of the Selective Laser Melting Production of Boron Dosed Inconel 718 Alloy and the Effects of Diffusion in the Melt Pool on Thermomechanical Properties****Technical Presentation: IMECE2022-99876***Mathew Farias - Mississippi State University**Ben Xu - Mississippi State University**Han Hu - University of Arkansas***3:24PM****A Comparative Numerical Investigation on Machining of Laminated and 3D Printed CFRP Composites****Technical Paper Publication: IMECE2022-95257***Mahmudul Hassan - Miami University**Sk Md. Alimuzzaman - Miami University**Jianfeng Ma - Saint Louis University**Muhammad Jahan - Miami University*

TECHNICAL SESSIONS

THURSDAY, NOVEMBER 3

2-12: Digital Manufacturing Process Simulation and Validation**02-12-02: Session #2: Digital Manufacturing Process Simulation and Validation****2:00PM–3:45PM - CONVENTION CENTER, D180****2:00PM**

Physical and Virtual Robotic Cells in Industry 4.0 Towards Industry 5.0: An XR-Based Conceptual Framework

Technical Paper Publication: IMECE2022-95021

Vladimir Kuts - University of Limerick
Maulshree Singh - Technological University of the Shannon: Midlands Midwest
Saeed Hamood Alsamhi - Technological University of the Shannon: Midlands Midwest
Declan Devine - Technological University of the Shannon: Midlands Midwest
Niall Murray - Technological University of the Shannon: Midlands Midwest

2:21PM

Computer Vision and Machine Learning to Create an Advanced Pick and Place Robotic Operation Using Industry 4.0 Trends

Technical Paper Publication: IMECE2022-89743

David Guerra-Zubiaga - Kennesaw State University
Angelicia Franklin - Kennesaw State University
Diego Escobar-Escobar - Kennesaw State University
Timothey Lemley - Kennesaw State University
Neeyaz Hariri - Kennesaw State University
Jeremy Plattel - Kennesaw State University
Chan Ham - Kennesaw State University

2:42PM

Digital Twin Simulations Based Reinforcement Learning for Navigation and Control of a Wheel-on-Leg Mobile Robot

Technical Paper Publication: IMECE2022-95411

Saleh Alsaleh - Tallinn University of Technology
Aleksei Teplyakov - Tallinn University of Technology
Mart Tamre - Tallinn University of Technology
Vladimir Kuts - Tallinn University of Technology
Eduard Petlenkov - Tallinn University of Technology

3:03PM

High Efficiency Manufacturing With a Smart Carbon Fiber End Effector

Technical Paper Publication: IMECE2022-94207

Carrington Chun - Kennesaw State University
David A. Guerra-Zubiaga - Kennesaw State University
Garrett Bailey - Kennesaw State University
Kathryn Bharadwaj - Kennesaw State University

3:24PM

Energy Consumption Evaluation on Robotic Drilling Process Using Digital Twin Technology

Technical Paper Publication: IMECE2022-95205

Matheus Santos - Universidade Federal de São Carlos
Rodrigo Lozan - Universidade Federal de São Carlos
Gustavo Barbosa - Universidade Federal de São Carlos
David Guerra-Zubiaga - Kennesaw State University
Sidney Shiki - Universidade Federal de São Carlos

2-11: Laser-Based Advanced Manufacturing and Materials Processing**02-11-02: Session #2: Laser-Based Advanced Manufacturing and Materials Processing****2:00PM–3:45PM - CONVENTION CENTER, D181**

TECHNICAL SESSIONS

THURSDAY, NOVEMBER 3

2:00PM**Characterization of Additively Manufactured Metals From ADDere Printing****Technical Paper Publication: IMECE2022-88299**

Joshua Foster - University of Memphis
Subha Kumpaty - Milwaukee School of Engineering
Liam Coen - INNIO Waukesha Engines
Al Perkins - Perkins Engineering
Michael Gengler - Midwest Engineered Systems
Scott Woida - Midwest Engineered Systems

2:21PM**A Multi-Scale Model for Microstructure Evolution During Multi-Material Additive Manufacturing Process****Technical Paper Publication: IMECE2022-92563**

Abba Abubakar - King Fahd University of Petroleum and Minerals
Khaled Al-Athel - King Fahd University of Petroleum and Minerals
Syed Sohail Akhtar - King Fahd University of Petroleum and Minerals
Abdulazeez Abubakar - Kano University of Science and Technology

2:42PM**An Adaptive Thermal Finite Element Simulation of Direct Energy Deposition With Reinforcement Learning: A Conceptual Framework****Technical Paper Publication: IMECE2022-95055**

Joao Sousa - Universidade do Porto
Roya Darabi - Universidade do Porto
Ana Reis - Universidade do Porto
Marco Parente - Universidade do Porto
Luís Paulo Reis - Universidade do Porto
Jose Cesar De Sa - Universidade do Porto

3:03PM**Using High-Speed Thermal Imaging to Understand Melt Pool Defects in Laser Powder Bed Fusion****Technical Presentation: IMECE2022-95817**

Guadalupe Quirarte - Carnegie Mellon University
Alexander Myers - Carnegie Mellon University
Syed Uddin - Carnegie Mellon University
Jonathan Malen - Carnegie Mellon University
Jack Beuth - Carnegie Mellon University

3:24PM**Metrology of Laser Ablation Using Optical Emission Spectroscopy****Technical Presentation: IMECE2022-99212**

Briana Cuero - The University of Texas at Austin
Kun-Chieh Chen - The University of Texas at Austin
Chih-Hao Chang - The University of Texas at Austin

2-9: Variation Simulation and Design for Assembly**02-09-02: Session #2: Variation Simulation and Design for Assembly Description****4:00PM–5:45PM - CONVENTION CENTER, C151****4:00PM****Contact Search Using a Kd-Tree for Non-Rigid Variation Simulation****Technical Paper Publication: IMECE2022-94989**

Roham Sadeghi Tabar - Chalmers University of Technology
Björn Lindau - Volvo Cars
Lars Lindkvist - Chalmers University of Technology
Kristina Wärmefjord - Chalmers University of Technology
Rikard Söderberg - Chalmers University of Technology



TECHNICAL SESSIONS

THURSDAY, NOVEMBER 3

4:21PM**Generating Synthetic Dataset Using COCO Format for Object Recognition****Technical Presentation: IMECE2022-99185***Juliana Danesi Ruiz - The University of Iowa**Phillip Deierling - The University of Iowa**Rachel Vitali - The University of Iowa***4:42PM****Autonomous Open-Die Bulk Incremental Forming****Technical Presentation: IMECE2022-99518***Tobias Mahan - The Ohio State University**Michael Groeber - The Ohio State University**Andrew Gillman - Air Force Research Laboratory***5:03PM****Assembly for Enhanced Repeatability Under Planar Constraints****Technical Paper Publication: IMECE2022-95641***Jishnu Bordoloi - Indian Institute of Technology Delhi**Jitendra P. Khatait - Indian Institute of Technology Delhi**Sudipto Mukherjee - Indian Institute of Technology Delhi***5:24PM****Variation Analysis of Carbon Fibre Reinforced Polymers Light Weight Aero Engine Parts****Technical Paper Publication: IMECE2022-95539***Vilma Fernström - Chalmers University of Technology**Johan Lööf - GKN Aerospace**Andrew Frampton - GKN Aerospace**Lena Brunnacker - GKN Aerospace**Kristina Wärmefjord - Chalmers University of Technology**Rikard Söderberg - Chalmers University of Technology***2-12: Digital Manufacturing Process Simulation and Validation****02-12-03: Session #3: Digital Manufacturing Process Simulation and Validation****4:00PM–5:45PM - CONVENTION CENTER, D180****4:00PM****Recovering From Cyber-Manufacturing Attacks by Reinforcement Learning****Invited Presentation: IMECE2022-93982***Romesh Prasad - Syracuse University**Matthew Swanson - Syracuse University**Young Moon - Syracuse University***4:42PM****Comprehensive Analysis of Cyber-Manufacturing Attacks Using a Cyber-Manufacturing Testbed****Technical Paper Publication: IMECE2022-94075***Romesh Prasad - Syracuse University**Young Moon - Syracuse University***5:03PM****Taxonomy of Severity of Cyber-Attacks in Cyber-Manufacturing Systems****Technical Paper Publication: IMECE2022-94492***Carlos Espinoza-Zelaya - Syracuse University**Young Moon - Syracuse University***5:24PM****Assessing Severity of Cyber-Attack Threats Against Cyber-Manufacturing Systems****Technical Paper Publication: IMECE2022-94493***Carlos Espinoza-Zelaya - Syracuse University**Young Moon - Syracuse University*

TECHNICAL SESSIONS

THURSDAY, NOVEMBER 3

2-12: Digital Manufacturing Process Simulation and Validation**02-12-04: Session #4: Digital Manufacturing Process Simulation and Validation****4:00PM–5:45PM - CONVENTION CENTER, D181****4:00PM****Data Augmentation Using Spectral Failure Deltas to Diagnose Bearing Failure****Technical Paper Publication: IMECE2022-93869***Ethan Wescoat - Clemson University**Matthew Krugh - Clemson University**Laine Mears - Clemson University***4:21PM****Comparison of Residual Stresses in Cold Spray Coatings: Lagrangian vs. Eulerian Finite Element Methods****Technical Paper Publication: IMECE2022-93902***Jacob O'Donnell - Naval Undersea Warfare Center**Michael Smith - Naval Undersea Warfare Center**Paul Cavallaro - Naval Undersea Warfare Center***4:42PM****Conveyor-Less Matrix Assembly Layout Design to Maximize Labor Productivity and Footprint Usage****Technical Paper Publication: IMECE2022-94628***Ankur Verma - The Pennsylvania State University**Seog-Chan Oh - General Motors**James W. Wells - General Motors**Jorge Arinez - General Motors**Soundar Kumara - The Pennsylvania State University***5:03PM****Forestry Crane Immersive User Interface for Control and Teleoperation****Technical Paper Publication: IMECE2022-94975***Simone Luca Pizzagalli - Tallinn University of Technology**Yevhen Bondarenko - Tallinn University of Technology**Baris Cem Baykara - Tallinn University of Technology**Alar Niidas - Tallinn University of Technology**Vladimir Kuts - Tallinn University of Technology**Margus Kerm - BMF**Tauno Otto - Tallinn University of Technology***5:24PM****Exploration in Using the Weibull Distribution for Characterizing Trends in Bearing Failure Operational Changes****Technical Paper Publication: IMECE2022-95441***Ethan Wescoat - Clemson University**Joshua Bradford - Clemson University**Matthew Krugh - Clemson University**Laine Mears - Clemson University***IMECE**[®]**ONE GREAT LEARNING EXPERIENCE.**
INTERNATIONAL MECHANICAL ENGINEERING
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TECHNICAL SESSIONS

Track 3: Advanced Materials: Design, Processing, Characterization and Applications Sponsored by the Materials Division

Topics:

- 3-1: Mechanics of Penetration, Shockwaves, and High-Strain-Rate Events: Modeling and Experiments
- 3-2: Modeling and Experimentation of Geomaterials
- 3-3: Integrated Computational Materials Engineering (ICME)
- 3-4: Modeling and Experiments in Nanomechanics and Nanomaterials
- 3-5: Design, Material Processing, and Applications of Composites
- 3-6: Mechanics and Materials of Soft/Flexible/Stretchable Electronics
- 3-7: Material Processing of Flexible/Emerging Electronics, Sensors, and Devices
- 3-8: Design of engineered materials and components for additive manufacturing
- 3-9: Design of Engineering Materials
- 3-10: Intelligent Designs of Soft-Hard Integration for Functional Materials
- 3-11: Manufacturing, Integration and Characterization of Multifunctional Structure and Devices
- 3-12: Architected Composites and Structures: Design for Multifunctionality
- 3-13: Printed Hybrid Multifunctional Electronics and Energy Devices
- 3-14: Mechanics of adhesion and friction
- 3-15: Mechanics of Low Dimensional Materials
- 3-16: Multifunctional Intelligent Materials and Systems
- 3-18: Bioinspired Materials, Structures and Applications
- 3-19: Multifunctional Energy Storage Materials and Systems
- 3-20: Multifunctional Composite/Safety Materials
- 3-21: Soft Robotics, Machine, and Intelligence
- 3-22: Modeling, Simulation, and Design of Multifunctional Materials
- 3-23: Dynamics of Advanced Functional Materials and Structures
- 3-24: Nanoengineered, Nano Modified, Hierarchical, Multi-Scale Materials and Structures
- 3-25: Processing of Ceramics and Composites for Additive and Advanced Manufacturing
- 3-26: Fracture and Damage: Nano- to Macro-Scale
- 3-27: Materials Processing and Characterization
- 3-28: Recent Developments in Tribology
- 3-29: Applications of AI/ML for Materials Processing
- 3-30: Fluid Dynamics Effects in Materials Processing and Advanced Manufacturing
- 3-31: Materials for biomedical devices and medications in healthcare
- 3-32: Artificial Intelligence and Machine Learning in Biomedical Material Design
- 3-33: Multi-scale and multi-physics mechanics of soft and biological materials
- 3-34: Nanomaterials for Energy

ACKNOWLEDGMENT TRACK ORGANIZERS

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Track Co-Organizer: Hanqing JIANG

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Ahsan Mian, Wright State University

Andrew Bowman, US Army ERDC

Brian Bush, National Institute of Standards and Technology

Changhong Cao, McGill University

Changyong Cao, Michigan State University

Chenglin (Bob) Wu, Ph.D., Missouri University of Science and Technology

Cunjiang Yu, University of Houston



TECHNICAL SESSIONS

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Dr. Andrew Gaynor, U.S. Army Research Laboratory

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Dr. Jun Xu, University of North Carolina at Charlotte"

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Prof. Pei Dong, George Mason University

Prof. Ram Mohan, North Carolina A&T State University

Prof. Richard Zhang, University of North Texas

Qing Tu, Ph.D., Texas A&M University



TECHNICAL SESSIONS

MONDAY, OCTOBER 31

Ram V Mohan, North Carolina A&T State University
 Wayne Hodo U. S. Army Engineering Research and Development Center
 Wei Gao, Ph.D., University of Texas at San Antonio
 Xueju “Sophie” Wang, University of Connecticut
 Xueju “Sophie” Wang, University of Missouri, Columbia
 Yozo Mikata, Fluor

SESSION ORGANIZERS

Ahsan Mian - Wright State University
 Andreas Robertson - Georgia Institute of Technology
 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
 Caglar Oskay - Vanderbilt University
 Chenglin Wu - Missouri University of Science and Technology
 Chunhao Yuan - The University of North Carolina at Charlotte
 Feruza Amirkulova - San Jose State University
 George Z. Voyiadjis - Louisiana State University
 Jon Ryu - North Carolina State University
 Joseph Anthony - University of Leeds
 Jun Xu – The University of North Carolina at Charlotte
 Kedar Kirane - Stony Brook University
 Ling Liu - Temple University
 Majid Minary Jolandan - Arizona State University
 Michael Pettes - Los Alamos National Laboratory
 Mohammad Naraghi - Texas A&M University
 Mohammadreza Yaghoobi - University of Michigan
 Patricia Iglesias - Rochester Institute of Technology
 Pei Dong - George Mason University
 Raghu Prakash - Indian Institute of Technology Madras

Ram Mohan - North Carolina A&T University
 Sara Adibi - Mississippi State University
 Seyed Allameh – Northern Kentucky University
 Sha Yin - Beihang University
 Sridhar Santhanam - Villanova University
 Vishwas Jadhav - North Carolina A&T State University
 Weiyi Lu - Michigan State University
 William Lawrimore - U.S. Army Engineer Research and Development Center
 Xiang Gao - The University of North Carolina at Charlotte
 Xin Ning - Penn State University
 Xueju Wang - University of Connecticut
 Yan Li - Dartmouth College
 Yozo Mikata - Fluor
 Yumeng Li - University of Illinois at Urbana-Champaign

TRACK 3**MONDAY, OCTOBER 31****3-5: Design, Material Processing, and Applications of Composites****03-05-01 Design, Material Processing, and Applications of Polymer Composites****10:45AM–12:30PM - CONVENTION CENTER, D182****10:45AM****Frontal Polymerization of Short-Fiber-Reinforced Polymer Matrix Composites****Technical Presentation: IMECE2022-98985**

Tolga Topkaya - Batman University
 Yuan Gao - University of Illinois at Urbana Champaign
 Philippe H. Geubelle - University of Illinois at Urbana Champaign



TECHNICAL SESSIONS

MONDAY, OCTOBER 31

11:06AM

Design of Experiment and Machine Learning-Based Framework to Investigate Mechanical Strength of Soft and Lightweight Hybrid Composites

Technical Presentation: IMECE2022-98829

Sanjida Ferdousi - University of North Texas

Yijie Jiang - University of North Texas

11:27AM

Lightweight Approaches to Automotive Composites: Nanocellulose and Kaolin

Technical Presentation: IMECE2022-93930

Eric Biederman - Georgia Institute of Technology

Kyriaki Kalaitzidou - Georgia Institute of Technology

Athina Bellonia - Georgia Institute of Technology

Shadi Shariatnia - Texas A&M University

Dorin Jarrahbashi - Texas A&M University

Amir Asadi - Texas A&M University

11:48AM

Effects of the CNT Network Size and Interphase on Mode I Fracture of Buckypaper Nanocomposites

Technical Paper Publication: IMECE2022-95573

Masoud Yekani Fard - Arizona State University

Rohan Raman - Arizona State University

Yesenia Orozco - Arizona State University

Aditi Tata - Arizona State University

12:09PM

Statistical Analysis of Strain Rate Dependency of the Mechanical Properties of Unidirectional CFRE Materials

Technical Paper Publication: IMECE2022-94402

Charbel Y. Seif - American University of Beirut

Ilige S. Hage - Notre Dame University-Louaize

Re-Mi Hage - Notre Dame University-Louaize

Ahmad M.R. Baydoun - American University of Beirut

Ramsey F. Hamade - American University of Beirut

3-23: Dynamics of Advanced Functional Materials and Structures

03-23-01: Dynamics of Advanced Functional Materials and Structures

10:45AM–12:30PM - CONVENTION CENTER, D183**10:45AM**

Molecular Deformation Mechanism of Polymer Materials During Nanoindentation With Strain Rate Effect: Molecular Dynamics Simulation and Experimentation

Technical Presentation: IMECE2022-94935

Hiroki Nishino - Chuo University

Ayumu Morimura - Chuo University

Miki Kajihara - Chuo University

Yusuke Nakao - Chuo University

Akio Yonezu - Chuo University

11:06AM

Accelerated Structural Design of Cellular Materials for Compressive Deformation Using a Machine-Learning

Technical Paper Publication: IMECE2022-95522

Jinlan Song - Chuo University

Aoi Takagi - Chuo University

Genki Mitsuhashi - Chuo University

Kohei Saito - Chuo University

Kazuma Ogata - Chuo University

Yoshinori Takano - Chuo University

Takeru Miyagawa - Chuo University

Akio Yonezu - Chuo University

11:27AM

Design and Manufacturing of Tunable Ceramic Composites Through Energy Dissipation Pathway Control

Technical Presentation: IMECE2022-99414

Yan Li - Dartmouth College



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TECHNICAL SESSIONS

MONDAY, OCTOBER 31

11:48AM**Ultra-Light Kirigami-Based Chain for Superior Impact Mitigation****Technical Presentation: IMECE2022-100003***Wen Zhang - The University of North Carolina at Charlotte**Jun Xu - University of North Carolina at Charlotte***12:09PM****Programmable Cellular Structures for Energy Absorption****Technical Presentation: IMECE2022-100030***Wen Zhang - The University of North Carolina at Charlotte**Jun Xu - The University of North Carolina at Charlotte***3-15: Mechanics of Low Dimensional Materials****03-15-01: Mechanics of Low Dimensional Materials****10:45AM -12:30PM - Convention Center,
CONVENTION CENTER, A210/A211****10:45AM****Fatigue of Molecularly Thin 2D Hybrid Organic-Inorganic Perovskite****Technical Presentation: IMECE2022-95191***Qing Tu - Texas A&M University**Doyun Kim - Texas A&M University**Eugenia Vasileiadou - Northwestern University**Ioannis Spanopoulos - University of South Florida**Mercouri Kanatzidis - Northwestern University***11:06AM****Machine Learning Potentials for Atomic Disorder Effects in Graphene****Technical Paper Publication: IMECE2022-95341***Akash Singh - University of Illinois at Urbana Champaign**Yumeng Li - University of Illinois at Urbana-Champaign***11:27AM****Elastocaloric Effect in MoS₂ Under Uniaxial Tension: A Molecular Dynamics Study****Technical Presentation: IMECE2022-100256***Mahabubur Rahman - Clemson University**Huijuan Zhao - Clemson University***11:48AM****Monolayer MoSe₂/P3HT Hybrid Crystals for High-Performance Photoelectric Devices****Technical Presentation: IMECE2022-99862***Mingyuan Sun - Villanova University**Dong Zhou - Villanova University**Ningxin Li - Georgia State University**Sidong Lei - Georgia State University**Bo Li - Villanova University***3-5: Design, Material Processing, and Applications of Composites****03-05-02: Design, Material Processing, and Applications of Epoxy Composites****2:00PM–3:45PM - CONVENTION CENTER, D182****IMECE**[®]**ONE GREAT LEARNING EXPERIENCE.**
INTERNATIONAL MECHANICAL ENGINEERING
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TECHNICAL SESSIONS

MONDAY, OCTOBER 31

2:00PM

Investigation of the Acoustic Performance of Plantain (Musa Paradisiacal) Fibre Reinforced Epoxy Biocomposite

Technical Paper Publication: IMECE2022-94773

*Patrick Imoisili - University of Johannesburg
Emeka Nwanna - University of Johannesburg
George Enebe - University of Johannesburg
Tien-Chien Jen - University of Johannesburg*

2:21PM

Evaluation of Graded Recycled Glass/epoxy Composite

Technical Paper Publication: IMECE2022-95733

*Ahmed Hegazy - The British University in Egypt
Mahmoud Abd El-Latief - The British University in Egypt
Omar Khalaf - The British University in Egypt
Mostafa Shazly - The British University In Egypt*

2:42PM

Nanocellulose Coated Glass Fiber Fabric-Epoxy Composites as a Lightweight Alternative of Glass Fiber-Epoxy Composites

Technical Presentation: IMECE2022-96127

*Kim Anh Pham - Georgia Institute of Technology
Kyriaki Kalaitzidou - Georgia Institute of Technology
Tequila Harris - Georgia Institute of Technology*

3:03PM

Development of a Predictive Model and Optimization for the Kerf Properties and Delamination Length in AWJM of Kevlar Epoxy Composite

Technical Paper Publication: IMECE2022-96214

*Puneet Kumar - National Institute of Fashion Technology
Sachin Salunkhe - Vel Tech Rangarajan Dr. Sagunthala R&D Institute of Science and Technology
Ragavanantham Shanmugam - Navajo Technical University
Basanta Kumar Bhuyan – Manav Rachna International Institute of Research and Studies
Anil Kumar Dahiya - Maharaja Agrasen Institute of Technology
Yuvaraj N - Vel Tech Rangarajan Dr. Sagunthala R&D Institute of Science and Technology*

3:24PM

Design and Development of Novel α -SiAlON/Co/TiCN Composites for Cutting Tool Inserts

Technical Paper Publication: IMECE2022-94964

*Amer Duraywish Alotaibi - King Fahad University of Petroleum and Minerals
Abba Abubakar - King Fahad University of Petroleum and Minerals
Syed Sohail Akhtar - King Fahad University of Petroleum and Minerals
Abbas Saeed Hakeem - King Fahad University of Petroleum and Minerals
Khaled Saleh Al-Athel - King Fahad University of Petroleum and Minerals
Abulfazal M. Arif - McMaster University*

3-13: Printed Hybrid Multifunctional Electronics and Energy Devices

03-13-01: Multifunctional Electronics and Energy Devices



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TECHNICAL SESSIONS

MONDAY, OCTOBER 31

2:00PM–3:45PM - CONVENTION CENTER, D183

2:00PM

Structure-Resistance Relationship of 3D Printed Electrically Conductive Woodpile-Structured Metamaterials**Technical Paper Publication: IMECE2022-94945***Hayk Vasilyan - Dubai Electricity & Water Authority**Oginne Lapuz - Dubai Electricity & Water Authority**Rahmat Agung Susantyoko - Dubai Electricity & Water Authority**Ahmad Almheiri - Dubai Electricity & Water Authority**Mozah Alyammahi - Dubai Electricity & Water Authority*

2:21PM

Fabrication of Miniature and Interdigital Lithium-Ion Batteries via Drop-on-Demand Inkjet Printing**Technical Presentation: IMECE2022-96679***Habib Ajose - Wright State University**Ahsan Mian - Wright State University**Hong Huang - Wright State University*

2:42PM

Computational Modeling of Polymer Flexoelectric Materials in Energy Harvesting Applications**Technical Presentation: IMECE2022-100245***Daniel Roskuski - University of Massachusetts Dartmouth**Caiwei Shen - University of Massachusetts Dartmouth**Jun Li - University of Massachusetts Dartmouth*

3:03PM

Three-Dimensional Finite Element Analysis of Microstructural Deformation of Anode Sheet in Lithium-Ion Battery (LIB)**Technical Presentation: IMECE2022-95397***Kazuma Ogata - Chuo University**Yoshinori Takano - Chuo University**Akio Yonezu - Chuo University***3-7: Material Processing of Flexible/Emerging Electronics, Sensors, and Devices****03-07-01: Material Processing of Flexible/Emerging Electronics, Sensors, and Devices I**

2:00PM–3:45PM - CONVENTION CENTER, A210/A211

2:00PM

Advanced Thin-Film Materials and Electronics for High-Resolution and Chronically Stable Neural Interfaces**Technical Presentation: IMECE2022-100082***Jinghua Li - The Ohio State University*

2:21PM

Porous Graphene-Based Neural Electrode for Highly Efficient Peripheral Nerve Stimulation**Technical Presentation: IMECE2022-100161***Shirin Movaghgharnezhad - George Mason University**Hyojin Kim - Korea Research Institute of Chemical Technology**Byoung Ga Kim - Korea Research Institute of Chemical Technology**Pilgyu Kang - George Mason University*

2:42PM

Soft, Wireless Pressure-Sensor-Integrated Smart Bandage for the Management of Diabetic Foot Ulcers**IMECE**[®]**ONE GREAT LEARNING EXPERIENCE.**
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TECHNICAL SESSIONS

MONDAY, OCTOBER 31

Technical Presentation: IMECE2022-100189

Xueju Wang - University of Connecticut
 Ian Heck - University of Missouri
 Zizheng Wang - University of Connecticut

3:03PM**Machine Learning-Assisted Ultrafast Flash Sintering of High-Performance and Wearable Silver-Selenide Thermoelectric Devices****Technical Presentation: IMECE2022-99978**

Mortaza Saeidi-Javash - University of Notre Dame
 Ke Wang - University of Notre Dame
 Minxiang Zeng - University of Notre Dame
 Tengfei Luo - University of Notre Dame
 Alexander Dowling - University of Notre Dame
 Yanliang Zhang - University of Notre Dame

3:24PM**Effects of Infill on the Additive Manufacturing of Piezoresistive Pressure Sensors****Technical Paper Publication: IMECE2022-91749**

James Banks - Texas State University
 Meysam Khaleghian - Texas State University
 Anahita Emami - Texas State University

3-5: Design, Material Processing, and Applications of Composites**03-05-03: Design, Material Processing, and Applications of Metal and Ceramic Composites****4:00PM–5:45PM - CONVENTION CENTER, D182****4:00PM****Effect of Multi-Stage Age Treatment on Mechanical Properties of 7075 Al Alloy****Technical Paper Publication: IMECE2022-95883**

Ahm Rahman - Pennsylvania State University - Harrisburg
 Issam Abu-Mahfouz - Pennsylvania State University - Harrisburg
 Amit Banerjee - Pennsylvania State University - Harrisburg
 Johnmark Wisniewski - Pennsylvania State University - Harrisburg

4:21PM**Using Freeze-Casting Method to Create Copper Composite With Lamellar Structures: An Experimental Study of the Freezing Behavior of Cupric Oxide Colloidal Suspensions****Technical Paper Publication: IMECE2022-88559**

Christopher Kasprzak - University of Maryland, Baltimore County
 Christina Hoffman - University of Maryland, Baltimore County
 Ruey-Hung Chen - University of Maryland, Baltimore County
 Liang Zhu - University of Maryland, Baltimore County
 Ronghui Ma - University of Maryland, Baltimore County

4:42PM**A Study on the Effect of Graphene on the Vibrational and Flame Retardant Characteristics of the GFRP Composites****Technical Paper Publication: IMECE2022-95066**

Thangapandian Nagamalai - St. Joseph's Institute of Technology
 Ragavanantham Shanmugam - Navajo Technical University
 Thirumal Azhagan Murugan - Anna University
 Mohanavel Vinayagam - Bharath Institute of Higher Education and Technology
 Seth Dennison - Navajo Technical University



TECHNICAL SESSIONS

MONDAY, OCTOBER 31

5:03PM

Cellulose Nanofibers (CNF)/Carbon Fiber Composites With Enhanced Flexural Strength for Structural Applications

Technical Paper Publication: IMECE2022-95772

Siddharth Bhaganagar - Indiana University–Purdue University Indianapolis

Pias Kumar Biswas - Indiana University–Purdue University Indianapolis

Mangilal Agarwal - Indiana University–Purdue University-Indianapolis

Hamid Dalir - Indiana University–Purdue University Indianapolis

5:24PM

3D Printed Ceramic Hybrid Structures With High Porosity Using Direct Ink Writing Technology

Technical Presentation: IMECE2022-99688

Yun Li - Villanova University

Bo Li - Villanova University

3-34: Nanomaterials for Energy

03-34-01: Nanomaterials for Energy

4:00PM–5:45PM - CONVENTION CENTER, D183

4:00PM

An Energetics-Based Criterion of Imperfection-Triggered Creasing in Soft Materials

Technical Presentation: IMECE2022-97136

Siyuan Song - Brown University

Kyung-Suk Kim - Brown University

Mrityunjay Kothari - Massachusetts Institute of Technology

4:21PM

Molecular Dynamics Simulation of Metal-Ligand Coordinated Poly(dimethylsiloxane)

Technical Presentation: IMECE2022-99752

Jinyue Dai - Cornell University

Xinyue Zhang - Cornell University

Jingjie Yeo - Cornell University

Meredith Silberstein - Cornell University

4:42PM

Wood Converted Carbon and Its Application on Water Desalination and Supercapacitor

Technical Presentation: IMECE2022-99646

Rui He - George Mason University

Pei Dong - George Mason University

Yingchao Yang - University of Maine

Min Wang - University of Maine

5:03PM

Effect of Hydrogen Peroxide (H₂O₂) on the Graphene-Based Electrocatalyst for Oxygen Reduction Reaction (ORR)

Technical Presentation: IMECE2022-100024

Niladri Talukder - New Jersey Institute of Technology

Alexandros Paliouras - Northeastern University

Yudong Wang - New Jersey Institute of Technology

Bharath Babu Nunna - Weber State University

Eon Soo Lee - New Jersey Institute of Technology



TECHNICAL SESSIONS

MONDAY, OCTOBER 31

5:24PM**A Large Deformation Model for Rate-Dependent Phase Transitioning Shear Rate Stiffening Gels****Technical Presentation: IMECE2022-97802***Aditya Konale - Brown University**Zahra Ahmed - Brown University**Vikas Srivastava - Brown University***3-7: Material Processing of Flexible/Emerging Electronics, Sensors, and Devices****03-07-02: Material Processing and Mechanics of Flexible/Emerging Electronics, Sensors, and Devices II****4:00PM–5:45PM - CONVENTION CENTER, A210/A211****4:00PM****Soft, Pressure-Tolerant, Flexible Electronic Sensors for Sensing Under Harsh Environments****Technical Presentation: IMECE2022-99392***Xueju Wang - University of Connecticut**Yi Li - University of Connecticut**Shao-Hao Lu - University of Connecticut***4:21PM****Cyclic and Failure Response of Screen-Printed Stretchable Conductors: Computational Modeling and Experimental Characterization****Technical Presentation: IMECE2022-99702***Kailey Miller - University of Massachusetts Lowell**Vahidreza Alizadeh - University of Massachusetts Lowell**Alexander Krueger - University of Massachusetts Lowell**Joey Mead - University of Massachusetts Lowell**Alireza Amirkhizi - University of Massachusetts Lowell***4:42PM****Characterizing the Role of Ionic Diode Boundary Conditions in Performance Degradation****Technical Presentation: IMECE2022-99725***Max Tepermeister - Cornell University**Nikola Bosnjak - Cornell University**Meredith Silberstein - Cornell University***5:03PM****Room Temperature Processing of Layered Transition Metal Carbide (MXene) Films****Technical Presentation: IMECE2022-94822***Logan Sharp - Penn State University**Nahid Al-Mamun - Penn State University**Md Haque - Penn State University***5:24PM****Self-Limiting Collision-Based Assembly of Monolayer on Polymer Substrates****Technical Presentation: IMECE2022-99859***Liang Zhao - Villanova University**Bachara Sidnawi - Villanova University**Jichao Fan - The University of Utah**Ruiyang Chen - The University of Utah**Thomas Scully - Villanova University**Scott Dietrich - Villanova University**Weilu Gao - The University of Utah**Qianhong Wu - Villanova University**Bo Li - Villanova University*

TECHNICAL SESSIONS

MONDAY, OCTOBER 31

TRACK 3

TUESDAY, NOVEMBER 1

Track 3: Advanced Materials: Design, Processing, Characterization and Applications

Tuesday, November 1, 9:15AM-10:00AM

Room: A212/A213

Greater Columbus Convention Center

Title: Materials by Design: Three-Dimensional (3D) Nano-Architected Meta-Materials

Julia Greer

California Institute of Technology

03-18-01: Bio-inspired and biomedical materials and devices

10:15AM–12:00PM - CONVENTION CENTER, A212/A213

10:15AM

Deoxyribonucleic Acid (Dna) Bio-Scaffold Assisted Synthesis of Manganese Cobaltite for High-Performance Asymmetric Supercapacitor Application

Technical Presentation: IMECE2022-95247

Johnbosco Yesuraj - Chungbuk national University

Kibum Kim - Chungbuk National University

10:36AM

Antibacterial Effects of Bio-Inspired Nanoarchitected Surface: A Coarse-Grained Simulation Study

Technical Paper Publication: IMECE2022-95325

Akash Singh - University of Illinois at Urbana-Champaign

Yumeng Li - University of Illinois at Urbana-Champaign

10:57AM

Cyclic Swelling Enabled, Electrically Sensing Based 3D Porous Structured Microfluidic Device for Rapid Urinalysis

Technical Presentation: IMECE2022-99584

Mengtian Yin - University of Virginia

Baoxing Xu - University of Virginia

11:18AM

Microscopic Characterization of Composite and Bio-Composite Materials

Technical Presentation: IMECE2022-98859

Fang Zhou - ZEISS Research Microscopy Solutions

Yin Sha - Beihang University

3-3: Integrated Computational Materials Engineering (ICME)

03-03-01: Integrated Computational Materials Engineering (ICME)

10:15AM–12:00PM - CONVENTION CENTER, A214/A215

10:15AM

A Dislocation-Based Crystal Plasticity Finite Element Simulation for the Micropillar Compression

Technical Presentation: IMECE2022-94854

George Z. Voyiadjis - Louisiana State University

Juyoung Jeong - Louisiana State University

10:36AM

AI-Enhanced Advanced Algorithms for the Micromechanical Modeling and Design of Materials With Complex Microstructures

Technical Presentation: IMECE2022-99091

Soheil Soghrati - The Ohio State University

Mingshi Ji - The Ohio State University

Pengfei Zhang - The Ohio State University

Salil Pai - The Ohio State University

Balavignesh Vemparala - The Ohio State University



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TECHNICAL SESSIONS

TUESDAY, NOVEMBER 1

10:57AM

Investigation of Mechanical Properties of Combinatorial Ti-Cu Film Using MD Simulation With Neural Network Potential

Technical Paper Publication: IMECE2022-94934

Takeru Miyagawa - Chuo University

Yugo Sakai - Chuo University

Akio Yonezu - Chuo University

Kazuki Mori - ITOCHU Techno-Solutions Corporation

Nobuhiko Kato - ITOCHU Techno-Solutions Corporation

Keiji Ishibashi - Comet Inc.

11:18AM

Synthetic Microstructure Generation via Approximation of the Stochastic Microstructure Function Using Gaussian Random Fields

Technical Presentation: IMECE2022-99763

Andreas Robertson - Georgia Institute of Technology

Surya Kalidindi - Georgia Institute of Technology

11:39AM

Bayesian Analysis of Model Form Probabilities for Crystal Plasticity Models and Assessment of Slip Transfer Relations for Lamellar Grains in $\alpha+\beta$ Titanium Alloys

Technical Presentation: IMECE2022-94753

Aditya Venkatraman - Georgia Institute of Technology

3-27: Materials Processing and Characterization**03-27-01: Materials Processing and Characterization - I****10:15AM–12:00PM - CONVENTION CENTER, A210/A211****10:15AM**

Investigating the Thermal and Mechanical Properties of Polyurethane Urea Nanocomposites for Subsea Applications

Invited Presentation: IMECE2022-95623

Chinyere Okolo - Northumbria University

Ahmed Elmarakbi - Northumbria University

Martin Birkett - Northumbria University

10:57AM

Thermo-Mechanical Behavior of Multi-Layer Deposition for Wire Arc Additive Manufacturing of Structural Steel

Technical Paper Publication: IMECE2022-88917

Amritesh Kumar - Indian Institute of Technology Guwahati

Swarup Bag - Indian Institute of Technology Guwahati

Vikas Srivastava - CSIR-National Metallurgical Laboratory

M. Ruhul Amin - Montana State University

11:18AM

Crystalline Phase Change Due to High-Speed Impact on 304L Steel

Technical Paper Publication: IMECE2022-92028

Muna Slewa - Embry-Riddle Aeronautical University, Prescott

11:39AM

Non-Destructive Infrared Thermographic Curing Analysis of Polymer Composites

Technical Paper Publication: IMECE2022-96116

Md Ashiqur Rahman - The University of Texas Rio Grande Valley

Javier Becerril - The University of Texas Rio Grande Valley

Dipannita Ghosh - The University of Texas Rio Grande Valley

Nazmul Islam - The University of Texas Rio Grande Valley

Ali Ashraf - The University of Texas Rio Grande Valley



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TECHNICAL SESSIONS

TUESDAY, NOVEMBER 1

3-20: Multifunctional Composite/Safety Materials**03-20-01: Multifunctional and Architected Composites****1:30PM–3:15PM - CONVENTION CENTER, A212/A213****1:30PM**

Effect of Cell-Wall Angle on the Mechanical Properties of 3D-Printed Hierarchical Re-Entrant Honeycomb

Technical Paper Publication: IMECE2022-93988

Chi Zhan - Michigan State University
Mingzhe Li - Michigan State University
Weiyi Lu - Michigan State University

1:51PM

Stochastic Analysis of the Carbon Nanotube Network Interphase in Dry and Pre-Infused Buckypaper

Technical Paper Publication: IMECE2022-95523

Masoud Yekani Fard - Arizona State University
Samuel Perrino - Arizona State University
Conor Hedman - Arizona State University

2:12PM

Mechanical Characterization of Thermally Insulated Composites

Technical Paper Publication: IMECE2022-95165

Michael Smith - Naval Undersea Warfare Center
Paul Cavallaro - Naval Undersea Warfare Center
Jacob O'Donnell - Naval Undersea Warfare Center
Eric Warner - Naval Undersea Warfare Center
Nicholas Valm - Naval Undersea Warfare Center
Nick Gencarelle - Smarter Building Systems, LLC

2:33PM

Additive Manufacturing and Mechanical Characterization of Hybrid Lattice Structures for Stretchability Enhancement

Technical Presentation: IMECE2022-94499

Giovanni Meli - Clemson University
James Banks - Texas State University
Hribhu Chowdhury - Texas State University
Anahita Emami - Texas State University

2:54PM

Origami Metamaterials Deployed Using Shape-Memory Alloy: Actuation Time and Energy

Technical Paper Publication: IMECE2022-96969

Anthony Santamaria - Western New England University
Moochul Shin - Western New England University
Hunter Cocks - Western New England University

3-1: Mechanics of Penetration, Shockwaves, and High-Strain-Rate Events: Modeling and Experiments**03-01-01: Mechanics of Penetration, Shockwaves, and High-Strain-Rate Events: Modeling and Experiments****1:30PM–3:15PM - CONVENTION CENTER, A214/A215****1:30PM**

Comparison of Ballistic Impact Simulations Using Different Constitutive Material Models of Concrete

Technical Paper Publication: IMECE2022-94248

Chris Duncan - Mississippi State University
Richard Perkins - Universities Space Research Association
Daniel Johnson - Center for Advanced Vehicular Systems



TECHNICAL SESSIONS

TUESDAY, NOVEMBER 1

Mei Chandler - U.S. Army Engineer Research and Development Center

Robert Moser – U.S. Army Engineering Research and Development Center

Jesse Sherburn - U.S. Army Engineer Research and Development Center

Youssef Hammi - Mississippi State University

1:51PM

Impact of Imperfect Kolsky Bar Experiments Across Different Scales Using Finite Elements

Technical Paper Publication: IMECE2022-96816

Thomas Hannah - The Pennsylvania State University

Reuben Kraft - The Pennsylvania State University

Valerie Martin - The Pennsylvania State University

Steve Ellis - Los Alamos National Laboratory

2:12PM

Improving Low Temperature Signal Quality in Ir Thermography Kolsky Bar Experiments Through Coating Design

Technical Presentation: IMECE2022-97030

Seyyed Danial Salehi - University of Utah

Owen Kingstedt - University of Utah

2:33PM

Molecular Dynamics Simulations of the Shock Response of Homopolymers and Copolymers

Technical Presentation: IMECE2022-99977

Andrew Bowman - U.S. Army Engineer Research and Development Center

Michael Roth - U.S. Army Engineer Research and Development Center

Manoj Shukla - U.S. Army Engineer Research and Development Center

2:54PM

Analysis of the Thermal Response of Polycarbonate Resulting From High Velocity Impact

Technical Presentation: IMECE2022-99701

Alexander Krueger - University of Massachusetts Lowell

Daniel Schmidt - Luxembourg Institute of Science and Technology

Alireza Amirkhizi - University of Massachusetts Lowell

3-27: Materials Processing and Characterization

03-27-02: Materials Processing and Characterization - II

1:30PM–3:15PM - CONVENTION CENTER, A210/A211

1:30PM

On the Micromechanical Properties of Conventional and 3D-Printed Rebar

Technical Paper Publication: IMECE2022-94651

Seyed Allameh - Northern Kentucky University

Alexis Eckart - Northern Kentucky University

Jose Fonseca Lopez - Northern Kentucky University

Roger Miller - Northern Kentucky University

Avery Lenihan - Gatton Academy of Mathematics and Science

Hadi Allameh - Sullair

1:51PM

One-Minute Control of Metallic Microstructures at Room Temperature

Technical Presentation: IMECE2022-94814

I-Chun Chou – The Pennsylvania State University

Logan Sharp - The Pennsylvania State University

Nahid Al-Mamun - The Pennsylvania State University

Md. Haque - The Pennsylvania State University



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TECHNICAL SESSIONS

TUESDAY, NOVEMBER 1

2:12PM

Exploring the Potential Role of Prunus Domestica in Corrosion Inhibition of Aa6063-T5 Aluminium Alloy in Sodium Chloride Media

Technical Paper Publication: IMECE2022-94911

Omotayo Sanni - University of Johannesburg
Jianwei Ren - University of Johannesburg
Tien-Chien Jen - University of Johannesburg

2:33PM

Production of Date Palm Nanoparticle Reinforced Composites and Characterization of Their Mechanical Properties

Technical Paper Publication: IMECE2022-95413

Mahmoud Al-Safy - Sultan Qaboos University
Nasr Al Hinai - Sultan Qaboos University
Khalid Alzebedeh - Sultan Qaboos University

2:54PM

Surface-Based 3D Printed Polymeric Lattice Structures for Vibration Attenuation

Technical Presentation: IMECE2022-96685

Imabin Ekpelu - Wright State University
Ahsan Mian - Wright State University

3-11: Manufacturing, Integration, and Characterization of Multifunctional Structure and Devices

03-11-01: Manufacturing, Integration, and Characterization of Multifunctional Structure and Devices

3:30PM–5:15PM - CONVENTION CENTER, A212/A213

3:30PM

A Green and Sustainable Approach for Carbon Steel Acidic Corrosion Inhibition Using Agricultural Waste: Experimental and Theoretical Studies

Technical Paper Publication: IMECE2022-95031

Omotayo Sanni - University of Johannesburg
Jianwei Ren - University of Johannesburg
Tien-Chien Jen - University of Johannesburg

3:51PM

Continuous Stereolithographic 3d Printing of Multi-Network Hydrogels in Triply Periodic Minimal Structures With Tunable Mechanical Strength for Energy Absorption

Technical Paper Publication: IMECE2022-95806

Zipeng Guo - The State University of New York at Buffalo
Ruizhe Yang - The State University of New York at Buffalo
Jun Liu - The State University of New York at Buffalo
Jason Armstrong - The State University of New York at Buffalo
Ruogang Zhao - The State University of New York at Buffalo
Chi Zhou - The State University of New York at Buffalo

4:12PM

Template-Free Manufacturing of Linearly Periodic Microstructured Surface by a Roll Coating Process for Multifunctional Applications

Technical Presentation: IMECE2022-95151

Md Didarul Islam - North Carolina State University
Himendra Perera - North Carolina State University
Benjamin Black - North Carolina State University
Matthew Phillips - North Carolina State University
Muh-Jang Chen - North Carolina State University
Yuxuan Liu - North Carolina State University
Saad Khan - North Carolina State University
Yong Zhu - North Carolina State University
Mohammed Zikry - North Carolina State University
Jon Ryu - North Carolina State University



TECHNICAL SESSIONS

TUESDAY, NOVEMBER 1

4:33PM**Template-Free Scalable Manufacturing of Self-Cleaning Passive Radiation Cooling Composites****Technical Presentation: IMECE2022-95701**

Sipan Liu - North Carolina State University
Md Didarul Islam - North Carolina State University
Myers Harbinson - North Carolina State University
Jong Eun Ryu - North Carolina State University

4:54 PM**Predicting and Controlling Ribbing Instabilities of CNT/PDMS Systems for Multifunctional Applications****Technical Presentation: IMECE2022-99765**

M. Phillips - North Carolina State University
M. Chen - North Carolina State University
D. Islam - North Carolina State University
J. Ryu - North Carolina State University
Mohammed Zikry - North Carolina State University

3-2: Modeling and Experimentation of Geomaterials**03-02-01: Modeling and Experimentation of Geomaterials****3:30PM–5:15PM - CONVENTION CENTER, A214/A215****3:30PM****Numerical Modeling of Tool-Rock Frictional Contact With Anisotropic Damage****Technical Presentation: IMECE2022-99715**

Yaneng Zhou - Louisiana State University
George Z. Voyiadjis - Louisiana State University

3:51PM**Elasto-Plastic Shockwaves in Jammed Ductile Granular Media****Technical Presentation: IMECE2022-99400**

Rannulu Devanjith Fonseka - University of Illinois at Urbana-Champaign
Philippe Geubelle - University of Illinois at Urbana-Champaign
John Lambros - University of Illinois at Urbana-Champaign
Amnaya Awasthi - University of Florida

4:12PM**Semi-Realistic Virtual Concrete Morphology Generation Using Asperity-Based Object Interference Detection****Technical Presentation: IMECE2022-100005**

William Lawrimore – U.S. Army Engineer Research and Development Center
Christa Torrence - Los Alamos National Laboratory
Andrew Bowman - U.S. Army Engineer Research and Development Center
Mei Chandler - U.S. Army Engineer Research and Development Center
Zach Grasley - Texas A&M University

4:33PM**Preparation of Hybrid Alkaline Cement Based on Natural Zeolite as Sustainable Building Material****Technical Paper Publication: IMECE2022-94558**

Mauricio Cornejo - Escuela Superior Politecnica del Litoral
Haci Baykara - Escuela Superior Politecnica del Litoral
Natividad Garcia - Escuela Superior Politecnica del Litoral
Juan Garces - Universidad Estatal Península de Santa Elena



TECHNICAL SESSIONS

TUESDAY, NOVEMBER 1

Walter Correa - Escuela Superior Politécnica del Litoral

Cecibel Frere - Escuela Superior Politécnica del Litoral

Julio Torres - Escuela Superior Politecnica del Litoral

4:54PM

Theory-Guided Selection of Ionic Liquids for Extraction of Metals From Extra-Terrestrial Regolith

Technical Presentation: IMECE2022-99946

Soumik Banerjee - Washington State University
Azmain Islam - Washington State University

3-27: Materials Processing and Characterization

03-27-03: Materials Processing and Characterization - III

3:30PM–5:15PM - CONVENTION CENTER, A210/A211

3:30PM

Evaluation of Dry Sliding Wear Characteristics of Hybrid Al-356 Composite

Technical Paper Publication: IMECE2022-95550

MudashiruLateef Owolabi - Ladoke Akintola University of Technology

Babatunde Issa Akinola - Ladoke Akintola University of Technology

Adewale Taiwo Olasumboye - Corning Inc.

3:51PM

Material Behavior of Hydrophobic Yb₂O₃ and Photocatalytic TiO₂ Coatings in HVAC Water Cooling Towers: A Case Study

Technical Paper Publication: IMECE2022-95726

Khaled Al-Athel - King Fahd University of Petroleum and Minerals

Turky Aldossary - Petrokemya

Syed Sohail Akhtar - King Fahd University of Petroleum and Minerals

4:12PM

Experimental Characterization of Chitosan Based Hydrogel With Different Cross-Linkers for Targeted Drug Delivery

Technical Presentation: IMECE2022-96823

Suyash Khand - The University of Texas Permian Basin
Md. Salah Uddin - The University of Texas Permian Basin

4:33PM

Mechanical Properties and Microstructure Evolution of Al 6061 Nanocomposites via Hot Isostatic Pressing

Technical Presentation: IMECE2022-99361

Sabrina Nilufar - Southern Illinois University Carbondale

Wilson Rativa-Parada - Southern Illinois University Carbondale

4:54PM

Fluid Convection in Frontal Polymerization and Potential Implications in Morphogenic Manufacturing

Technical Presentation: IMECE2022-99001

Yuan Gao - University of Illinois

Justine Paul - University of Illinois at Urbana-Champaign

Manxin Chen - University of Illinois at Urbana-Champaign

Nancy Sottos - University of Illinois at Urbana-Champaign

Philippe Geubelle - University of Illinois at Urbana-Champaign



TECHNICAL SESSIONS

WEDNESDAY, NOVEMBER 2

WEDNESDAY, NOVEMBER 2

Track 3: Advanced Materials: Design, Processing, Characterization and Applications

Wednesday, November 2, 9:45AM-10:30AM

Room: A212/A213

Greater Columbus Convention Center

Title: Materials Data & Informatics: Curation, Frameworks, Access, and Potential for Discovery and Design

*L. Cate Brinson
Duke University*

3-9: Design of Engineering Materials

03-09-01: High Temperature Materials

10:45AM–12:30PM - CONVENTION CENTER, D183

10:45AM

Characterization and Experimentation of Additive Manufactured Layered Thin-Walled Elements for High Temperature Alloys

Invited Presentation: IMECE2022-95761

*George Z. Voyiadjis - Louisiana State University
Reem Abo Znemah - Louisiana State University
Paul Wood - University of Derby*

11:27AM

Additive Manufacturing With Ceramic Slurries

Technical Paper Publication: IMECE2022-96033

*Margaret Nowicki - United States Military Academy
Sara Sheward - United States Military Academy
Lane Zuchowski - United States Military Academy
Seth Addeo - United States Military Academy*

Owen States - United States Military Academy

Oreofeoluwa Omolade - United States Military Academy

Steven Andreen - United States Military Academy

Nicholas Ku - Army Research Laboratory

Lionel Vargas-Gonzalez - Army Research Laboratory

Jennifer Bennett - United States Military Academy

11:48AM

Effect of Cr Addition on the Microstructure and Mechanical Properties of Additively Manufactured Grcop-84

Technical Presentation: IMECE2022-99224

*Ajay Bhagavatam - Wayne State University
Husam Alrehaili - Wayne State University
Golam Newaz - Wayne State University
Guru Dinda - Savannah River National Laboratory*

12:09PM

Novel Thermal Coating for High-Speed Airplanes

Technical Paper Publication: IMECE2022-95482

*Abinash Satapathy - Kennesaw State University
Lakshay Battu - Kennesaw State University
Liam Watson - Kennesaw State University
Nazanin Rajabi - Kennesaw State University
Jungkyu Park - Kennesaw State University*

3-4: Modeling and Experiments in Nanomechanics and Nanomaterials

03-04-01: Modeling and Experiments in Nanomechanics and Nanomaterials

10:45AM–12:30PM - CONVENTION CENTER, A210/A211



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TECHNICAL SESSIONS

WEDNESDAY, NOVEMBER 2

10:45AM**Guided Polymer Assembly on MoSe₂****Technical Presentation: IMECE2022-94561***Akash Singh - University of Illinois**Yumeng Li - University of Illinois at Urbana-Champaign***11:06AM****Molecular Dynamics Simulation of the Effect of Hydrogen on the Interaction Between Dislocations in Alpha-Iron****Technical Paper Publication: IMECE2022-94722***Sunday Oyinbo - University of Johannesburg**Tien-Chien Jen - University of Johannesburg***11:27AM****A Molecular Dynamic Study on the Piezoelectric Properties of Bulk ZnS and Nanobelts****Technical Paper Publication: IMECE2022-95592***Iyad Hijazi - Marshall University**Rui Xie - Marshall University**Regis Houachissi - Marshall University***11:48AM****Photothermochemical Nanoassembly of 3D Porous Graphene and Palladium Nanoparticles for High-Performance Hydrogen Detection****Technical Presentation: IMECE2022-95244***Seung Min Lee - George Mason University***12:09PM****Implementation of ANN Modeling Techniques and Genetic Algorithm in the Diameter Prediction of MWCNTs/Epoxy Nanofibers for CFRP Structures****Technical Paper Publication: IMECE2022-90499***Pias Kumar Biswas - Indiana University-Purdue University Indianapolis**Pradnya Zende - Indiana University-Purdue University Indianapolis**Hamid Dalir - Indiana University-Purdue University Indianapolis**Mangilal Agarwal - Indiana University-Purdue University Indianapolis***3-9: Design of Engineering Materials****03-09-02: Inverse Design of Metamaterials****2:00PM–3:45PM - CONVENTION CENTER, D183****2:00PM****Auxetic Metamaterial Development With Commercial Finite Element Tools****Technical Paper Publication: IMECE2022-95464***Casey Corrado - The MITRE Corporation**William Skelton - The MITRE Corporation**Alexander Angilella - The MITRE Corporation**Kristine Rosfjord - The MITRE Corporation***2:21PM****Broadband Acoustic Metamaterial Design Using Variational Autoencoder Networks and Bayesian Optimization****Technical Presentation: IMECE2022-98559***Feruza Amirkulova - San Jose State University**Thang Tran - San Jose State university**Ehsan Khatami - San Jose State University***IMECE**[®]**ONE GREAT LEARNING EXPERIENCE.**
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TECHNICAL SESSIONS

WEDNESDAY, NOVEMBER 2

2:42PM**Inverse Design of Mechanical Metamaterials With Geometric Deep Learning****Technical Presentation: IMECE2022-99315***Jida Huang - University of Illinois at Chicago
Mohammad Abu-Mualla - University of Illinois at Chicago***3:03PM****Deep Learning Assisted Pentamode Metamaterial Design****Technical Presentation: IMECE2022-99994***Cheng Qiu - San José State University
Anam Abbas - San José State University
Feruzha Amirkulova - San José State University***3:24PM****Superelastic Nitinol Shape Memory Alloy by Selective Laser Melting for the Biomedical Application****Technical Presentation: IMECE2022-99655***Sarower Tareq - Michigan State University
Bibek Poudel - Michigan State University
Hoa Nguyen - Michigan State University
Haseung Chung - Michigan State University
Patrick Kwon - Michigan State University***3-24: Nanoengineered, Nano Modified, Hierarchical, Multi-Scale Materials and Structures****03-24-01: Nanoengineered, Nano Modified, Hierarchical, Multi-Scale Materials, and Structures****2:00PM–3:45PM - CONVENTION CENTER, A210/A211****2:00PM****Experimental and Numerical Investigation of the Influence of Crack Front Orientation in Mode 1 Plane Strain Fracture Toughness of a Vero Material System via Polyjet Additive Manufacturing****Technical Paper Publication: IMECE2022-96915***Vishwanath Khapper - North Carolina A&T State University
Ram Mohan - North Carolina A&T State University***2:21PM****Effect of Interleaved Mwcnts Buckypaper on the Mechanical Properties of Non-Crimp Carbon Fiber Composites****Technical Paper Publication: IMECE2022-94193***Vishwas Jadhav - North Carolina A&T State University
Ajit D. Kelkar - North Carolina A&T State University***2:42PM****Effect of Metastructure Design on the Sensitivity of Pressure Sensors****Technical Paper Publication: IMECE2022-95099***Huan Zhao - Dartmouth College
Julia E. Huddy - Dartmouth College
William J. Scheideler - Dartmouth College
Yan Li - Dartmouth College***3:03PM****Prediction of Porosity and Its Mechanisms in Metal Additive Manufacturing****Technical Paper Publication: IMECE2022-96918***Ram Mohan - North Carolina A&T State University
Nikhil Ingle - North Carolina A&T State University*

TECHNICAL SESSIONS

WEDNESDAY, NOVEMBER 2

3:24PM

**Removal of Impurities From Nitrogen-Doped/
Metal Organic Framework Graphene (N-G/
MOF) Electrocatalyst for Electrochemical Energy
Conversion and Storage Systems**

Technical Presentation: IMECE2022-100034

Alexandros Paliouras - Northeastern University

*Niladri Talukder - New Jersey Institute
of Technology*

Yudong Wang - New Jersey Institute of Technology

Bharath Babu Nunna - Weber State University

Eon Soo Lee - New Jersey Institute of Technology

3-9: Design of Engineering Materials**03-09-03: Design of Engineering Materials****4:00PM–5:45PM - CONVENTION CENTER, D183****4:00PM**

**Characterization of Additively Manufactured
Beta Materials**

Technical Paper Publication: IMECE2022-88301

Efrem Dana - Milwaukee School of Engineering

Subha Kumpaty - Milwaukee School of Engineering

Jordan Weston - Milwaukee School of Engineering

4:21PM

**Development of Recyclable and Biodegradable
Additively Manufactured Corn-Based Composites**

Technical Presentation: IMECE2022-99069

Md. Nurul Islam - University of North Texas

Yijie Jiang - University of North Texas

Sheldon Shi - University of North Texas

Yu Fu - University of North Texas

4:42PM

**Engineered Nanosurfactants for
Additive Manufacturing**

Technical Presentation: IMECE2022-99997

Minxiang Zeng - Texas Tech University

5:03PM

**Broadband Acoustic Lens Design Using Gradient-
Based Optimization and Adjusting Radii and
Positions of Scatterers**

Technical Presentation: IMECE2022-100127

Vaishnavi Dabhade - San Jose State University

Feruzza Amirkulova - San Jose State University

Samer Gerges - San Jose State University

5:24PM

**Acoustic Metamaterial Design Using Deep
Reinforcement Learning**

Technical Presentation: IMECE2022-100241

Feruzza Amirkulova - San Jose State University

Tristan Shah - San Jose State University

3-28: Recent Developments in Tribology**03-28-01: Joint Session on Recent Advances in
Advanced Materials Processing and Tribology****4:00PM–5:45PM - CONVENTION CENTER, A210/A211****4:00PM**

Inkjet Printed Ceramic/polymer Composite Dielectrics

Technical Presentation: IMECE2022-89068

Mustapha Muhammad - Wright State University

Hong Huang - Wright State University

Ahsan Mian - Wright State University



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TECHNICAL SESSIONS

WEDNESDAY, NOVEMBER 2

4:21PM**3D Printing and Characterization of Alumina****Technical Presentation: IMECE2022-98967***Majid Minary - Arizona State University**Ashley Myles - Arizona State University**Adam Griffith - Arizona State University***4:42PM****Thermo-Mechanical Analysis of a Composite Tapered-Land Hydrodynamic Thrust Bearing Sectors Manufactured Using Fused Filament Fabrication****Technical Paper Publication: IMECE2022-94853***Isaiah Yasko - Ohio University**Lloyd Furuta - Ohio University**Collier Fais - Ohio University**Muhammad Ali - Ohio University**Brian Wisner - Ohio University***5:03PM****Experimental Investigation of Fixed-Geometry Hydrodynamic Thrust Bearing Taper Geometry on Critical Operating Parameters****Technical Paper Publication: IMECE2022-95071***Collier Fais - Ohio University**Isaiah Yasko - Ohio University**Anbara Lutfullaeva - Ohio University**Muhammad Ali - Ohio University**Rick Walker - MIBA Bearings***5:24PM****Effects of Surface Finish and Molecular Structure on the Lubricating Ability of Borate-Based Protic Ionic Liquids****Technical Paper Publication: IMECE2022-95163***Alfonso Sierra - Rochester Institute of Technology**Hope Scott - Rochester Institute of Technology**Darwin Pray - Rochester Institute of Technology**Zachary Polus - Rochester Institute of Technology**Patricia Iglesias - Rochester Institute of Technology*

TECHNICAL SESSIONS

Track 4: Advances in Aerospace Technology

Sponsored by the Aerospace Division

Topics:

- 4-1: General Aerospace
- 4-2: Advances in Aerodynamics
- 4-3: Novel Aerospace Propulsion Systems
- 4-4: Advances in Aerospace Structures and Materials
- 4-5: Beam, Plate, and Shell Structures
- 4-6: Lightweight Sandwich Composites and Layered Structures
- 4-7: Dynamic Behavior of Composites
- 4-8: Dynamics and Control of Aerospace Structures
- 4-9: Materials and Structures for Extreme Environments
- 4-10: Impact, Damage and Fracture of Composite Structures
- 4-11: Advances in Mechanics, Multiscale Models and Experimental Techniques for Composites
- 4-12: Peridynamics Modeling
- 4-13: Computational Aerospace Structural Dynamics and Aeroelasticity
- 4-14: Nonlinear Problems in Aerospace Structures
- 4-15: Congress-Wide Symposium on NDE & SHM – NDE and Prognostics in Structural Applications
- 4-16: Advanced Manufacturing in Aerospace Engineering
- 4-17: Applications of Artificial Intelligence/Machine Learning in Aerospace Engineering
- 4-18: Congress-Wide Symposium on Advanced Research in Marine and Aerospace Lifting Surfaces
- 4-19: Greening Aviation
- 4-20: Unmanned Aircraft Systems (UAS): Propulsion, Energy and Applications

ACKNOWLEDGMENT TRACK ORGANIZERS

Track Organizer: Uttam Chakravarty

Track Co-Organizer: Zhangxian Yuan

TOPIC ORGANIZERS

Alfonso Pagani , Politecnico di Torino

Ali Najafi , ANSYS, Inc.

Baoxing Xu , University of Virginia

Bin Wu , National University of Ireland Galway

Caglar Oskay , Vanderbilt University

Carlos Xisto, Chalmers University of Technology

Casey Harwood, University of Iowa

Dianyun Zhang, Purdue University

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Erdogan Madenci, University of Arizona

Erkan Oterkus , University of Strathclyde

Esteban Alejandro Valencia Torres, Escuela Politécnica Nacional

Evan Pineda , National Aeronautics and Space Administration

Fang Jiang , Purdue University

Francisco Brojo, University of Beira Interior

George Kardomateas, Georgia Institute of Technology

Ibrahim Guven , Virginia Commonwealth University

Jakson Monteiro , Universidade Pública de Cabo Verde

Jinwei Shen , University of Alabama

Jorge Gregório, Instituto Politécnico da Guarda

José Páscoa , University of Beira Interior

Konstantin Matveev , Washington State University

Kwek-Tze Tan, University of Akron

Lea-Der Chen, Texas A&M University – Corpus Christi

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Michele Trancossi, Sheffield Hallam University

Mingzhe Li, Michigan State University

Nikolaos Xiros , University of New Orleans

Olesya Zhupanska , University of Arizona

Paulo Figueiredo , CEiiA

Phillip Deierling, University of Iowa



TECHNICAL SESSIONS

WEDNESDAY, NOVEMBER 2

Pinar Acar, Virginia Polytechnic Institute and State University

Portia Banerjee, National Aeronautics and Space Administration

Uttam Chakravarty, University of New Orleans

Weiyi Lu, Michigan State University

Xiang Zhang, University of Wyoming

Xin Liu, University of Texas at Arlington

Xin Ning, Pennsylvania State University

Xin-Lin Gao, Southern Methodist University

Yanfeng Shen, Shanghai Jiao Tong University

Yeoshua Frostig, Technion – Israel Institute of Technology

Yeqing Wang, Syracuse University

Yi Wang, University of South Carolina

Yiliang Liao, Iowa State University

Yingtao Liu, University of Oklahoma

Yiska Goldfeld, Technion – Israel Institute of Technology

Yongming Liu, Arizona State University

Zhangxian Yuan, Worcester Polytechnic Institute

SESSION ORGANIZERS

Ali Najafi - ANSYS, Inc.

Erdogan Madenci - The University of Arizona

Erkan Oterkus - University of Strathclyde

Fang Jiang - Envision Energy

Francisco Brojo - Universidade da Beira Interior

Hai Feng Zhao - University of Chinese Academy of Sciences

Kwek Tze Tan - The University of Akron

Lea-Der Chen - Texas A&M University–Corpus Christi

Uttam Chakravarty - The University of New Orleans

Xin Liu - The University of Texas at Arlington

Yeqing Wang - Syracuse University

Yi Wang - University of South Carolina

Yiska Goldfeld - Technion – Israel Institute of Technology

Zhangxian Yuan - Worcester Polytechnic Institute

TRACK 4**WEDNESDAY, NOVEMBER 2**

Track 4: Advances in Aerospace Technology

Wednesday, November 2, 9:45AM-10:30AM

Room: A214/A215

Greater Columbus Convention Center

Title: Modeling and Manipulation of Wall-Bounded Turbulent Flows: From the Laboratory to High Reynolds Numbers

*Beverley J. McKeon**California Institute of Technology***4-3: Novel Aerospace Propulsion Systems**

04-03-01: (04-03: Novel Aerospace Propulsion Systems & 04-20: Unmanned Aircraft Systems (UAS): Propulsion, Energy and Applications)

10:45AM–12:30PM - CONVENTION CENTER, A212/A213**10:45AM**

Vision Based Safe Navigation of Uav for Overhead Line Inspection Enabled by Virtual Safety Bubble

Technical Paper Publication: IMECE2022-95358*Rufaidah Salim - Dubai Electricity & Water Authority R&D Centre**Mahmoud Rezk - Dubai Electricity & Water Authority R&D Centre**Mohammed Anzil - Dubai Electricity & Water Authority R&D Center**Nawal Aljasmí - Dubai Electricity & Water Authority R&D Center**Amit Shukla - Dubai Electricity & Water Authority R&D Center***11:06AM**

Hybrid-Electric Propulsion Solutions for UAV Application

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TECHNICAL SESSIONS

WEDNESDAY, NOVEMBER 2

Technical Paper Publication: IMECE2022-95375*Diogo Marto - C-MAST**Francisco Brojo - Universidade da Beira Interior***11:27AM****A Novel Fuzzy-BELBIC Structure for the Adaptive Control of Satellite Attitude****Technical Paper Publication: IMECE2022-96034***Kosar Safari - University of Connecticut**Farhad Imani - University of Connecticut***11:48AM****Model Order Reduction of Scramjet Isolator Shock Dynamics During Unstart****Technical Paper Publication: IMECE2022-94316***Jack Sullivan - The Ohio State University**Datta Gaitonde - The Ohio State University***12:09PM****Experimental Study of a Novel 4 Stroke Spark Ignition Geared-Hypocycloid Engine****Technical Paper Publication: IMECE2022-95368***Alexandre Nunes - C-MAST**Francisco Brojo - Universidade da Beira Interior***4-4: Advances in Aerospace Structures and Materials****04-04-01: (04-04: Advances in Aerospace Structures and Materials & 04-11: Advances in Mechanics, Multiscale Models and Experimental Techniques for Composites)****2:00PM–3:45PM CONVENTION CENTER, A212/A213****2:00PM****Heterogenous Beam Element Based on Timoshenko Beam Model****Technical Paper Publication: IMECE2022-94187***Rong Chiu - Purdue University**Wenbin Yu - Purdue University***2:21PM****Thermo-Mechanical Properties of Si-C/Mineral Binder Composites for Space Applications****Technical Paper Publication: IMECE2022-95056***Sujithra Chandrasekaran - The University of North Carolina at Charlotte**Ahmed El-Ghannam - The University of North Carolina at Charlotte**James A. Monroe - ALLVAR**Chengying Xu - North Carolina State University***2:42PM****MSG-Base Design and Analysis of Tailorable Composites****Technical Presentation: IMECE2022-95714***Su Tian - Purdue University**Yufei Long - Purdue University**Xin Liu - The University of Texas at Arlington**Liang Zhang - AnalySwift**Wenbin Yu - Purdue University***3:03PM****A Topology Optimization Methodology With Vibration Constraint for an Aerospace Bracket Design****Technical Paper Publication: IMECE2022-95843***Hüseyin Karabiyik - TOBB University of Economics and Technology**Osman Eroglu - TOBB University of Economics and Technology**Muhammed Metin Eskimez - TOBB University of Economics and Technology**Berk Oncu Oncul - TOBB University of Economics and Technology**Muhammed Tayyip Yilmaz - TOBB University of Economics and Technology**İstemihan Gökdağ - Turkish Aerospace Industry**Recep M. Gorguluarslan - TOBB University of Economics and Technology***IMECE**[®]**ONE GREAT LEARNING EXPERIENCE.**
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TECHNICAL SESSIONS

WEDNESDAY, NOVEMBER 2

3:24PM

Selective Laser Brazing, Diamond Grits, Phase-Field Modeling, Wetting Dynamics, Thermal, and Residual Stresses

Technical Presentation: IMECE2022-98823

Lu Li - Purdue University

Dianyuan Zhang - Purdue University

4-1: General Aerospace

04-01-01: (04-01: General Aerospace, 04-02: Advances in Aerodynamics & 04-19: Green Aviation)

4:00PM–5:45PM - CONVENTION CENTER, A212/A213

4:00PM

Urban Air Mobility: Design of a Virtual Reality Testbed and Experiments for Human Factors Evaluation

Technical Paper Publication: IMECE2022-95152

Praveen Shankar - California State University, Long Beach

Panadda Marayong - California State University, Long Beach

Thomas Strybel - California State University, Long Beach

Vernol Battiste - San Jose State University Research Foundation

Hanson Nguyen - California State University, Long Beach

Justin Cheung - California State University, Long Beach

Jesus Viramontes - California State University, Long Beach

4:21PM

Additive Manufacturing Process-Induced Wing Skin Deformation and Effects on Aerodynamic Performance

Technical Paper Publication: IMECE2022-96569

Justin Valenti - The Pennsylvania State University

Joseph Barolai - The Pennsylvania State University

Julia Cole - The Pennsylvania State University

Michael Yukish - The Pennsylvania State University

4:42PM

Study of Adhesively Bonded Multi-Material Joints Under Tensile Loading

Technical Presentation: IMECE2022-99675

Yesim Kokner - The City College of New York

Feridun Delale - City University of New York/The City College of New York

Niell Elvin - The City College of New York

Ryan Strachan - Institut Catholique d'Arts et Métiers

5:03PM

CFD Analysis of the Combustion of Hydrogen Fuel on a CFM56-3 Combustor

Technical Paper Publication: IMECE2022-95371

Rafael Domingues - C-MAST

Francisco Brojo - Universidade da Beira Interior

Pedro Oliveira - C-MAST

5:24PM

Energy Harvesting and Wing Morphing Design Using Piezoelectric Macro Fiber Composites

Technical Paper Publication: IMECE2022-94146

Md Saifuddin Ahmed Atique - University of North Dakota

Cai Xia Yang - University of North Dakota

THURSDAY, NOVEMBER 3



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TECHNICAL SESSIONS

THURSDAY, NOVEMBER 3

Track 4: Advances in Aerospace Technology

Thursday, November 3, 9:15AM-10:00AM

Room: A214/A215

Greater Columbus Convention Center

Title: Advances in Aeroelasticity and Structural Dynamics at Gulfstream Aerospace

*Paul Taylor**Gulfstream Aerospace Corporation*

4-12: Peridynamics Modeling

04-12-01: Peridynamics Modeling I

10:15AM–12:00PM - CONVENTION CENTER, D183

10:15AM

Metano: A Meta-Learnt Nonlocal Operator Approach for Efficient Material Modeling

Technical Presentation: IMECE2022-100233

*Yue Yu - Lehigh University**Lu Zhang - Lehigh University*

10:36AM

Peridynamics-Lattice Boltzmann Coupling and Application to Biological Systems

Technical Presentation: IMECE2022-99754

*Sarah Davidson - University of Edinburgh**Sina Haeri - University of Edinburgh**Yonghao Zhang - University of Edinburgh*

10:57AM

Numerical Investigation of Cracking Behaviour in Photovoltaic Panels by Using Peridynamics

Technical Presentation: IMECE2022-99609

*Andrew Premchander - University of Strathclyde**Islam Amin - University of Strathclyde**Selda Oterkus - University of Strathclyde**Erkan Oterkus - University of Strathclyde**Nabil Ahmed Shawky Elminshawy -**Port Said University*

11:18AM

Peridynamic Model of Thermo-Chemo-Mechanical Coupling for Thermal Crack Propagation of Charring Materials

Technical Presentation: IMECE2022-99429

*Yanan Zhang - The University of Arizona**Deepak Behera - The University of Arizona**Erdogan Madenci - The University of Arizona*

11:39AM

Transformation Field Analysis in Predidynamic Micromechanics

Technical Presentation: IMECE2022-98984

*Michael Braginsky - University of Dayton Research Institute**Valeriy Buryachenko - Micromechanics and Composites LLC*

-4-8: Dynamics and Control of Aerospace Structures

04-08-01: (04-08: Dynamics and Control of Aerospace Structures & 04-13: Computational Aerospace Structural Dynamics and Aeroelasticity)

10:15AM-12:00PM CONVENTION CENTER, D182

10:15AM

An Evolutionary Aeroelastic Design Approach for Spars and Ribs of Flying Wing Aircraft

Technical Paper Publication: IMECE2022-90385

*Mojtaba Moshtaghzadeh - Florida International University**Natalia Rangel - Florida International University*

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Adrian Bejan - Duke University
Pezhman Mardanpour - Florida International University

10:36AM

Thermo-Mechanical Process Modeling of Additive Friction Stir Deposition of Ti-6Al-4V Alloy

Technical Paper Publication: IMECE2022-94717
Gazi Abu Raihan - The University of New Orleans
Uttam Chakravarty - The University of New Orleans

10:57AM

Numerical Analysis of the Vibration of Slender Beams

Technical Paper Publication: IMECE2022-95186
Pratik Sarker - Embry-Riddle Aeronautical University
Uttam K. Chakravarty - The University of New Orleans

11:18AM

Experimental Model for Rotor Disk Vortex Interference Effects on Quadcopter UAV Thrust Performance

Technical Paper Publication: IMECE2022-96623
Emma San Martin - United States Military Academy
Richard Melnyk - United States Military Academy

11:39AM

Finite Element Modeling and Experimental Validation of 3D Printed Polymeric Triply Periodic Minimal Surface (TPMS) Cellular Structures Under Low Velocity Impact Loads

Technical Presentation: IMECE2022-97657
Jesse Leiffer - Wright State University
Fadeel Abdalsalam - Wright State University
Anthony Palazotto - Wright State University
Ahsan Mian - Wright State University

4-10: Impact, Damage and Fracture of Composite Structures

04-10-01 (04-10: Impact, Damage and Fracture of Composite Structures & 04-14: Nonlinear Problems in Aerospace Structures)

2:00PM–3:45PM - CONVENTION CENTER, D182**2:00PM**

Nonlinear Transient Response of Isotropic and Composite Structures With Variable Kinematic Beam Finite Elements

Technical Paper Publication: IMECE2022-94973
Rodolfo Azzara - Politecnico di Torino
Matteo Filippi - Politecnico di Torino
Alfonso Pagani - Politecnico di Torino
Erasmus Carrera - Politecnico di Torino

2:21PM

Impact Damage Evaluations in a Composite Laminate Using Guided Wave-Based Simulation

Technical Paper Publication: IMECE2022-95057
Linqi Zhuang - Ansys, Inc.
Adarsh Chaurasia - Ansys, Inc.
Ali Najafi - Ansys, Inc.

2:42PM

A Finite Element Based Fatigue Damage Model of Composite Rotor Blades

Technical Presentation: IMECE2022-95721
Haodong Du - Purdue University
Wenbin Yu - Purdue University



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3:03PM**Impact Performance of Bioinspired 3d Printed Composite****Technical Presentation: IMECE2022-100146***Arnob Banik - The University of Akron***3:24PM****Effect of Arctic Temperature on Damage of Foam-Core Sandwich Composites****Technical Presentation: IMECE2022-100214***Kwek Tze Tan - The University of Akron***4-17: Applications of Artificial Intelligence/Machine Learning in Aerospace Engineering****04-17-01: Applications of Artificial Intelligence/Machine Learning in Aerospace Engineering I****2:00PM–3:45PM - CONVENTION CENTER, D183***Session Chair: Xin Liu - The University of Texas at Arlington**Session Co-Chair: Uttam Chakravarty - The University of New Orleans**Session Co-Chair: Yi Wang - University of South Carolina***2:00PM****Predicting Motion of Engine-Ingested Particles Using Deep Neural Networks****Invited Presentation: IMECE2022-93668***Travis Bowman - Virginia Tech**Cairen Miranda - Virginia Tech**John Palmore - Virginia Tech***2:42PM****A Digital Twin Framework for Mechanical Testing Powered by Machine Learning****Technical Paper Publication: IMECE2022-94680***Müge Kahya - TOBB University of Economics and Technology**Cem Söyleyici - TOBB University of Economics and Technology**Mete Bakır - Turkish Aerospace Inc.**Hakki Ozgur Unver - TOBB University of Economics and Technology***3:03PM****Supervised and Unsupervised Deep Learning Applications for Visual Slam: A Review****Technical Paper Publication: IMECE2022-95685***Uchechi Faithful Ukaegbu - University of Johannesburg**Lagouge Tartibu - University of Johannesburg**Chee Wah Lim - City University of Hong Kong***4-5: Beam, Plate, and Shell Structures****04-05-01: (04-05: Beam, Plate, and Shell Structures & 04-06: Lightweight Sandwich Composites and Layered Structures)****4:00PM–5:45PM - CONVENTION CENTER, D182***Session Chair: Fang Jiang - Envision Energy**Session Co-Chair: Uttam Chakravarty - The University of New Orleans**Session Co-Chair: Haifeng Zhao - University of Chinese Academy of Sciences***4:00PM****Dynamic Buckling of Sandwich Panels Subjected to Periodic Axial Forces****Technical Presentation: IMECE2022-99398***Zhangxian Yuan - Worcester Polytechnic Institute**George Kardomateas - Georgia Institute of Technology***IMECE**[®]**ONE GREAT LEARNING EXPERIENCE.**
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4:21PM

Evolution of Parametric Uncertainty Along the Structural Response of Sandwich Panels**Technical Presentation: IMECE2022-99441***Nachman Malkiel - Technion – Israel Institute of Technology**Oded Rabinovitch - Technion – Israel Institute of Technology*

4:42PM

Prediction of Sectional Collapse of Thin-Walled Structure Under Pure Bending by Nonlinear Composite Beam Theory**Technical Paper Publication: IMECE2022-96539***Fang Jiang - Envision Energy**Wenbin Yu - Purdue University*

5:03PM

On the Accuracy and Efficiency of Convolutional Neural Networks for Element-Wise Refinement of FEM Models**Technical Paper Publication: IMECE2022-93995***Marco Petrolo - Politecnico di Torino**Pierluigi Iannotti - Politecnico di Torino**Alfonso Pagani - Politecnico di Torino**Erasmus Carrera - Politecnico di Torino***4-16: Advanced Manufacturing in Aerospace Engineering****04-16-01: (04-16: Advanced Manufacturing in Aerospace Engineering & 04-15: Congress-Wide Symposium on NDE & SHM – NDE and Prognostics in Structural Applications)**

4:00PM–5:45PM - CONVENTION CENTER, D183

4:00PM

Novel Intelligent Textile and Fiber Reinforced MPC Composites for SHM**Technical Presentation: IMECE2022-94284***Yiska Goldfeld - Technion – Israel Institute of Technology**Lidor Yosef – Technion – Israel Institute of Technology*

4:21PM

Detecting Damaged Zones in Smart Self-Sensory Carbon Based TRC by TDR Measurements**Technical Presentation: IMECE2022-95667***Mahdi Gaben - Technion – Israel Institute of Technology**Yiska Goldfeld - Technion – Israel Institute of Technology*

4:42PM

Development and Implementation of a High-Temperature FDM Machine for Additive Manufacturing of Thermoplastics**Technical Paper Publication: IMECE2022-94361***Christopher Billings - University of Oklahoma**Mrinal Saha - University of Oklahoma**Yingtao Liu - University of Oklahoma*

5:03PM

Toward Mobile 3D Printing of Lunar Regolith via Simultaneous Localization and Additive Manufacturing**Technical Presentation: IMECE2022-95702***Mohammad Azami - Concordia University**Pierre-Lucas Aubin-Fournier - Concordia University**Krzysztof Skonieczny - Concordia University***04-17-02: (04:17: Applications of Artificial Intelligence/ Machine Learning in Aerospace Engineering II & 04-12: Peridynamics Modeling II)****IMECE**[®]**ONE GREAT LEARNING EXPERIENCE.**
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TECHNICAL SESSIONS

4:00PM–5:45PM - CONVENTION CENTER, B244/B245

4:00PM

Quasistatic Evolution With Unstable Forces With Application to Fracture Modeling**Technical Presentation: IMECE2022-99976***Robert Lipton - Louisiana State University**Debdeep Bhattacharya - Louisiana State University**Patrick Diehl - Louisiana State University*

4:21PM

Evaluation of Deep Learning Networks for Predicting Truss Topology Optimization Results**Technical Paper Publication: IMECE2022-95870***Recep M. Gorgularslan - TOBB University of Economics and Technology**Gorkem Can Ates - TOBB University of Economics and Technology*

4:42PM

Unsupervised Machine Learning Algorithms for Analysis of Low Velocity Impact Damage in Composite Structures From CT Image Data**Technical Paper Publication: IMECE2022-96262***Olesya Zhupanska - The University of Arizona**Pavlo Krokhmal - The University of Arizona*

5:03PM

Convolutional Neural Network for Predicting Mechanical Behavior of Non-Crimp Fabric Composites With Fiber Waviness**Technical Presentation: IMECE2022-99556***Xin Liu - The University of Texas at Arlington**Sérgio Costa - RISE SICOMP**Bangde Liu - The University of Texas at Arlington**Sarthak Trehan - Technical University of Denmark***Track 5: Biomedical and Biotechnology
Sponsored by the Bioengineering Division****Topics:**

- 5-1: Injury and Damage Biomechanics
- 5-2: Vibration and Acoustics in Biomedical Applications
- 5-3: Biomedical Imaging, Therapy and Tissue Characterization
- 5-4: Biomaterials and Tissue: Modelling, Synthesis, Fabrication and Characterization
- 5-5: Biomedical Devices
- 5-6: Dynamics and Control of Biomechanical Systems
- 5-7: Symposium on Clinical Applications of Bioengineering
- 5-8: Biotransport (Fluid, Heat and Mass)
- 5-9: Computational Modeling in Biomedical Applications
- 5-10: Musculoskeletal and Sports Biomechanics
- 5-11: Sensors and Actuators
- 5-12: Robotics, Rehabilitation
- 5-13: Bio Artificial Intelligence
- 5-14: Biotechnology and General Applications

**ACKNOWLEDGMENT
TRACK ORGANIZERS***Track Organizer: Linxia Gu**Track Co-Organizer: Reuben Kraft**Track Co-Organizer: Ahmed Al-Jumaily**Track Co-Organizer: Yi (Jason) Hua***TOPIC ORGANIZERS***Amit Bagchi**Ahmed Al-Jumaily, Auckland University of Technology**Anil Saigal**Anne Schmitz**Asheesh Lanba**Bin Zi*

TECHNICAL SESSIONS

Cahit A Evrensel, University of Nevada, Reno

Douglas Dow

Dumitru (Micky) I. Caruntu

Hai-Chao Han

Haojie Xia

Julie Z. Hao

Kalyani Nair

Karen Chang Yan

Karim Muci

Liandong Yu

Lulu Wang

Maurizio Manzo

Mohammad Al-Rawi

Parisa Saboori

Peyman Honarmandi

Pezhman Hassanpour

Ping Zhao

Ramjee Repaka

Reuben Kraft, Pennsylvania State University

Seyed Allameh

Shawn Duan

Takashi Saito

Toshihiko Shiraishi

X. Gary Tan

Xiaoning Jiang

Yi (Jason) Hua

Yingtao Liu

Yuan (Aaron) Feng

SESSION ORGANIZERS

Ahmed Al-Jumaily - Auckland University of Technology

Anil Saigal - Tufts University

Anne Schmitz - UW Stout

Asheesh Lanba

Bogdan Epureanu - University Of Michigan

Cahit Evrensel - University of Nevada, Reno

Dumitru Caruntu - The University of Texas Rio Grande Valley

Haojie Xia - Hefei University of Technology

Julie Hao - Old Dominion University

Linxia Gu - Florida Institute of Technology

Lulu Wang - Shenzhen Technology University

Maurizio Manzo - University of North Texas

Peyman Honarmandi - Manhattan College

Ping Zhao - Hefei University of Technology

Ramjee Repaka - Indian Institute of Technology Ropar

Reuben Kraft - The Pennsylvania State University

Seyed Allameh - Northern Kentucky University

Shawn Duan - Saint Martin's University

Takashi Saito - Yamaguchi University

Toshihiko Shiraishi - Yokohama National University

X. Gary Tan - U.S. Naval Research Lab

Yi Hua - University of Pittsburgh

Yingtao Liu - University of Oklahoma



TECHNICAL SESSIONS

MONDAY, OCTOBER 31

TRACK 5

MONDAY, OCTOBER 31

Monday, October 31, 9:45AM-10:30AM

Room: A210/A211

Greater Columbus Convention Center

Title: The Brain in Motion: Visualizing Brain Biomechanics and Understanding Traumatic Brain Injury*Philip Bayly**Washington University in St. Louis***5-2: Vibration and Acoustics in Biomedical Applications****05-02-01: Vibration and Acoustics in Biomedical Applications****10:45AM–12:30PM - CONVENTION CENTER, A214/A215****10:45AM****Transmission Characteristics of Pulsatile Parameters in an Initially-Tensioned Orthotropic Artery****Technical Paper Publication: IMECE2022-95078***Zhili Hao - Old Dominion University***11:06AM****Relations of Radial Vibration of the Arterial Wall to Pulsatile Parameters in Blood Flow for Extraction of Arterial Indices****Technical Paper Publication: IMECE2022-95084***Zhili Hao - Old Dominion University***11:27AM****Uniaxial Tensile Prestress and Waveguide Effects on Estimates of the Complex Shear Modulus Using Magnetic Resonance Elastography in Cylindrically-Shaped Soft Tissue Phantoms****Technical Presentation: IMECE2022-96528***Melika Salehabadi - University of Illinois Chicago**Joseph Crutison - University of Illinois Chicago**Dieter Klatt - University of Illinois Chicago**Thomas Royston - University of Illinois Chicago***11:48AM****Vibration-Based Rupture of Membranes for Sensing****Technical Presentation: IMECE2022-100060***Stephen Mclaughlin - Rutgers University**Ali Ashraf - The University of Texas Rio Grande Valley**Pengfei Xie - Rutgers University**Mehdi Javanmard - Rutgers University**Francois Berthiaume - Rutgers University**Aaron Mazzeo - Rutgers University***12:09PM****Biaxial Tensile Prestress and Waveguide Effects on Estimates of the Complex Shear Modulus Using Optical-Based Dynamic Elastography in Plate-Like Soft Tissue Phantoms****Technical Presentation: IMECE2022-96537***Marta Dore - University of Illinois Chicago**Aime Luna - University of Illinois Chicago**Thomas Royston - University of Illinois Chicago***5-8: Biotransport (Fluid, Heat, and Mass)****05-08-01: Biotransport (Fluid, Heat and Mass)****10:45AM–12:30PM - CONVENTION CENTER, A216****10:45AM****CFD Modeling of Interstitial Fluid Flow in Subcutaneous Adipose Tissue****Technical Paper Publication: IMECE2022-90593***Wael Mokhtar - Grand Valley State University**Ryan Lubbers - Grand Valley State University*

TECHNICAL SESSIONS

MONDAY, OCTOBER 31

11:06AM**Design and Implementation of a Biohybrid Diaphragm Pump to Be Driven by Cardiomyocytes****Technical Paper Publication: IMECE2022-94399***Lucas Artmann - Technical University of Munich**Valentin Ameres - Technical University of Munich**Emmy Wund - Technical University of Munich**Tim C. Lueth - Technical University of Munich***11:27AM****Rigidity Sensing by Blood-Borne Leukocytes: Is It Independent of Internal Signaling?****Technical Paper Publication: IMECE2022-95144***Madeline Smith - Mercer University**Arsha Moorthy - Mercer University**Patrick Kho - Mercer University**Chamaree de Silva - Mercer University**Alireza Sarvestani - Mercer University***11:48AM****Study of the Graphene Energy Absorbing Layer and the Viscosity of Sodium Alginate Bioink in Laser-Induced-Forward-Transfer (LIFT) Bioprinting****Technical Paper Publication: IMECE2022-96190***Shuqi Zhou - Mississippi State University**Jianzhi Li - The University of Texas Rio Grande Valley**Ben Xu - Mississippi State University***12:09PM****Osmosis****Technical Presentation: IMECE2022-94066***Larry Howlett - HTMD Engineering***5-1: Injury and Damage Biomechanics****05-01-01: Injury Mechanisms and Analyses****10:45AM–12:30PM - CONVENTION CENTER, A212/A213****10:45AM****A Dynamic Mode Decomposition Method for Modal Analysis of Human Brain Diagnosis****Technical Paper Publication: IMECE2022-96394***Mehran Fereydoonpour - North Dakota State University**Jayce Mclean - North Dakota State University**Mariusz Ziejewski - North Dakota State University**Ghodrat Karami - North Dakota State University***11:06AM****Experimental Model Development Using an Animal Brain Phantom to Study Neural Damage From Traumatic Brain Injury****Technical Paper Publication: IMECE2022-95989***Morshed Khandaker - University of Central Oklahoma**Amir Giri - University of Central Oklahoma**Pramod Nayak - University of Central Oklahoma**Catherine Jarshaw - University of Central Oklahoma**Onur Can Kalay - Bursa Uludag University**Fatih Karpat - Bursa Uludag University**Roman Wolf - VA Healthcare System***11:27AM****Computational Simulation and Experimental Evaluation of Blast Induced Impulse Noise Effect****Technical Presentation: IMECE2022-95900***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***IMECE**[®]**ONE GREAT LEARNING EXPERIENCE.**
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TECHNICAL SESSIONS

MONDAY, OCTOBER 31

11:48AM

Viscoelastic Constitutive Behavior of Brain's Grey Matter**Technical Presentation: IMECE2022-99958***Fahim Fazlullah - The University of Texas at Arlington**Md Nahian Bin Hossain - The University of Texas at Arlington**Ashfaq Adnan - The University of Texas at Arlington*

12:09PM

Effect of Individual Anatomical Differences in Brain Deformation From Head Accelerations: A Computational Study**Technical Presentation: IMECE2022-99710***Anu Tripathi - University of Wisconsin-Madison**Jose Guerrero Gonzalez - University of Wisconsin-Madison**Traci Snedden - University of Wisconsin-Madison**Alison Brooks - University of Wisconsin-Madison**Peter Ferrazzano - University of Wisconsin-Madison**Christian Franck - University of Wisconsin-Madison**Rika Wright Carlsen - Robert Morris University***05-15-01: General Biomedical and Biotechnology Topics - I****10:45AM–12:30PM - CONVENTION CENTER, A226**

10:45AM

A Passive Paper-Based Blood Plasma Separation Microfluidic Device for Point of Care Detection of Protein Biomarkers**Technical Presentation: IMECE2022-99425***Francisco Burgos - Universidad Simón Bolívar**Alexander Rodriguez - Universidad del Norte**Eliana Cervera - Universidad del Norte**Marco Sanjuan - Universidad del Norte**Pedro Villalba - Universidad del Norte*

11:06AM

Modeling and Control System for a Novel Thermoelectric Cooling System**Technical Paper Publication: IMECE2022-96602***Jeremy Bardarson - Louisiana State University**Jack Clement - Louisiana State University**Sachin Dahiya - Louisiana State University**Manas Gartia - Louisiana State University**Corina Barbalata - Louisiana State University*

11:27AM

Polymer Tissue Partition Coefficient in Implant Leaching and Biotransport**Technical Presentation: IMECE2022-99189***Martin Tanaka - Western Carolina University**Robert Elder - U.S. Food and Drug Administration**David Saylor - U.S. Food and Drug Administration*

11:48AM

Molecular Design of Nanoparticles for Nucleic Acid Delivery**Technical Presentation: IMECE2022-99215***Alexander Marras - The University of Texas at Austin***5-9: Computational Modeling in Biomedical Applications****05-09-01: Computational Modeling in Biomedical Applications I****2:00PM–3:45PM - CONVENTION CENTER, A212/A213**

2:00PM

CFD Study of the Influence of Sars-Cov-2 Deposition on Human Lung Dynamic: A Comparison Between Healthy and Diseased Condition**IMECE**[®]**ONE GREAT LEARNING EXPERIENCE.**
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Technical Paper Publication: IMECE2022-89261*Carlo Carotenuto - University of Modena e Reggio Emilia**Letizia Scurani - University of Modena e Reggio Emilia**Luca Fontanili - University of Modena e Reggio Emilia**Luca Montorsi - University of Modena e Reggio Emilia**Massimo Milani - University of Modena e Reggio Emilia***2:21PM****Utilizing Stent Wall Shear Stress to Assess Stent and Flow Diverter Performance for Treating Intracranial Aneurysms****Technical Paper Publication: IMECE2022-92013***Taylor Suess - South Dakota State University**Stephen Gent - South Dakota State University***2:42PM****Computational and Mathematical Models to Assess Early Stages Abdominal Aortic Aneurysm (AAA) Growth****Technical Paper Publication: IMECE2022-94139***Mohammad Al-Rawi - Waikato Institute of Technology**Ahmed Al-Jumaily - Auckland University of Technology**Djelloul Belkacemi - Hassiba Ben Bouali**University Chlef***3:03PM****Structural Evaluation of a Lapidus-Type Cuneometatarsal Arthrodesis****Technical Paper Publication: IMECE2022-94642***Natali Mancera-Campos - Universidad de Guanajuato**Josseline Paola Hinojosa-Buenrostro - Universidad de Guanajuato**A. Vidal-Lesso - Universidad de Guanajuato**Marco Antonio Martínez-Bocanegra - Instituto Tecnológico Nacional de México ITSUR**Javier Bayod-Lopez - University of Zaragoza***3:24PM****Evaluation of 3D-Printed Gel Using a Flat-Ended Square Indenter****Technical Paper Publication: IMECE2022-95004***Ana Isabel Delgado - Florida Institute of Technology**Pengfei Dong - Florida Institute of Technology**Linxia Gu - Florida Institute of Technology***5-5: Biomedical Devices****05-05-01 Biomedical Device - I****2:00PM–3:45PM - CONVENTION CENTER, A214/A215****2:00PM****Using Granular Jamming and a Parallel Compliant Mechanism to Provide a Rapidly Deployable, Custom-Fitted Cervical Collar****Technical Paper Publication: IMECE2022-94672***Patrick Herke - Louisiana State University**Abhishek Kumar - Bayonne Medical Center**Hunter Gilbert - Louisiana State University***2:21PM****Reliability Test of Mobile Embedded Accelerometers in Measuring Postural Stability for Individuals With Parkinson's Disease****Technical Paper Publication: IMECE2022-94806***Matthew Thelen - University of Michigan-Flint**Fardeen Mazumder - University of Michigan-Flint**Linda Zhu - University of Michigan-Flint**Charlotte Tang - University of Michigan-Flint**Nathaniel S. Miller - University of Michigan-Flint***2:42PM****Transradial Prosthesis for Fishing to Improve Rehabilitation Outcomes of Veterans****IMECE**[®]**ONE GREAT LEARNING EXPERIENCE.**
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Technical Paper Publication: IMECE2022-95254*Stephen Willey - Stevens Institute of Technology**Sally Shady - Stevens Institute of Technology***3:03PM****Pressure Relieving Device for Bedridden Patients Using Pneumatically Actuated Soft Robots****Technical Paper Publication: IMECE2022-95255***Lea Russo - University of Michigan**Mihir Gondhalekar - University of Michigan**Sridhar Kota - University of Michigan**Benjamin Bassin - Michigan Medicine***3:24PM****A Computational Model for Analysis of Particle Dynamics in a Ferro-Magnetic Microfluidic System****Technical Paper Publication: IMECE2022-95690***Maegan Edwards - The University of North Carolina at Charlotte**Rodward Hewlin - The University of North Carolina at Charlotte***5-10: Musculoskeletal and Sports Biomechanics****05-10-01: Musculoskeletal and Sports Biomechanics - I****2:00PM–3:45PM - CONVENTION CENTER, A216****2:00PM****Assessment of Soccer Ball Inflation Pressurizations and Risk of Brain Injury****Technical Paper Publication: IMECE2022-89701***Richard Perkins - Universities Space Research Association**Amirhamed Bakhtarydavijani - Center for Advanced Vehicular Systems**Raj Prabhu - Universities Space Research Association***2:21PM****Video Verification of an Instrumented Mouthguard in American Collegiate Men's Rugby****Technical Paper Publication: IMECE2022-94439***Travis Fetchko - U.S. Army Aeromedical Research Laboratory**Grace Boudreau - U.S. Army Aeromedical Research Laboratory**Megan Roach - Keller Army Community Hospital**Kenneth Cameron - Keller Army Community Hospital**Tyler Rooks - U.S. Army Aeromedical Research Laboratory***2:42PM****A Sustainable Approach to Designing a Bird Wing Prosthesis****Technical Paper Publication: IMECE2022-95725***Aleese Mukhamedjanova - Stevens Institute of Technology**Trinity Lundemo - Stevens Institute of Technology**Sally Shady - Stevens Institute of Technology***3:03PM****Unilateral Transtibial Amputee Gait Patterns: A Review****Technical Paper Publication: IMECE2022-96195***Daniel Moreno - Universidad EAFIT**Elizabeth Rendon-Velez - Universidad EAFIT**Fanny Valencia-Legarda - Fundacion Universitaria Maria Cano***3:24PM****Understanding Relative Motion Between the Brain and Skull in SBS****Technical Paper Publication: IMECE2022-97109***Paul Castrillon - Manhattan College**Parisa Saboori - Manhattan College**Graham Walker - Manhattan College*

TECHNICAL SESSIONS

MONDAY, OCTOBER 31

05-15-02: General Topics in Biomedical and Biotechnology - II**2:00PM–3:45PM - CONVENTION CENTER, A226****2:00PM****Finite Element Modeling of Vehicle Vibration and Its Effects on the Lumbar Spine****Technical Presentation: IMECE2022-99736***Eric Flynn Mabowitz - Mississippi State University**Michael A Murphy - Mississippi State University**Gehendra Sharma - Mississippi State University**Nayeon Lee - Mississippi State University**Sungkwang Mun - Mississippi State University**Tonya Stone - Mississippi State University**Lauren Priddy - Mississippi State University**Doyle Dickel - Mississippi State University**William G Bond – U.S. Army Engineer Research and Development Center**Raheleh Miralami - Mississippi State University***2:21PM****An AI-Enhanced Multiscale Mechano-Biological Model for Simulating the Bone Remodeling in the Vertebral Body****Technical Presentation: IMECE2022-99925***Balavignesh Vemparala - The Ohio State University**Mingshi Ji - The Ohio State University**Salil Pai - The Ohio State University**Prasath Mageswaran - The Ohio State University**Gregory G Knapik - The Ohio State University**Dukagjin M Blakaj - The Ohio State University**Eric C Bourekas - The Ohio State University**Ehud Mendel - Yale School of Medicine**William S Marras - The Ohio State University**Soheil Soghrati - The Ohio State University***2:42PM****Location Tracking of Implantable Stent by Fusing Magnetic and Inertial Measurements****Technical Presentation: IMECE2022-99397***Yifan Zhang - University of Pittsburgh**William Clark - University of Pittsburgh**Bryan Tillman - The Ohio State University**Youngjae Chun - University of Pittsburgh**Medical Center**Stephanie Liu - University of Pittsburgh**Dahlia Kenawy - The Ohio State University Wexner**Medical Center***3:03PM****Implementing and Evaluating a Cost-Effective Optical Biosensor With Integrated Artificial Intelligence and Machine Learning****Technical Presentation: IMECE2022-98982***Ethan Regal - Gannon University**Pezhman Hassanpour - Gannon University***5-4: Biomaterials and Tissue: Modelling, Synthesis, Fabrication and Characterization****05-04-01: Biomaterials and Tissue: Modelling, Synthesis, Fabrication and Characterization - I****4:00PM–5:45PM - CONVENTION CENTER, A212/A213****4:00PM****3D Printing Material Testing and Applications in Biomaterial Modeling for Pediatric Medical Trainers****Technical Paper Publication: IMECE2022-94352***Sheridan Perry - Embry-Riddle Aeronautical University**Victor Huayamave - Embry-Riddle Aeronautical**University, Daytona Beach**Bryan Gonzalez - Embry-Riddle Aeronautical**University, Daytona Beach**Zachary Nadeau - Embry-Riddle Aeronautical**University, Daytona Beach**Rafael Rodriguez - Embry-Riddle Aeronautical**University, Daytona Beach*

TECHNICAL SESSIONS

MONDAY, OCTOBER 31

4:21PM

Modeling the Damage Initiation of White Matter Brain Tissue During Indentation**Technical Paper Publication: IMECE2022-94702***Ge He - Shanghai University**Lei Fan - Michigan State University*

4:42PM

Developing a Multi-Functional Sensor for Cell Traction Force, Matrix Remodeling and Biomechanical Assays in Self-Assembled 3D Tissues in Vitro**Technical Presentation: IMECE2022-94733***Bashar Emon - University of Illinois at Urbana-Champaign**M. Saddam H. Joy - University of Illinois at Urbana-Champaign**M. Taher A. Saif - University of Illinois at Urbana-Champaign*

5:03PM

Hydrophobicity Improvements of Polymers Used in Biomedical Applications**Technical Paper Publication: IMECE2022-95610***Mohammad Hossain - Texas A&M University-Kingsville**Vinay Reddy Lokasani - Texas A&M University-Kingsville***5-11: Sensors and Actuators****05-11-01: Sensors and Actuators - I****4:00PM–5:45PM - CONVENTION CENTER, A216**

4:00PM

Model Predictive Control of the Transparent Omnidirectional Locomotion Compensator With a Simple Prediction of a Walking Fire Ant**Technical Paper Publication: IMECE2022-94028***Kevin Le - Kennesaw State University**Todd Morgan - Kennesaw State University**Riley Plank - Kennesaw State University**Clint Penick - Kennesaw State University**Dal Hyung Kim - Kennesaw State University*

4:21PM

Development of 3D Printed Soft Pneumatic Hand Motion Sensors**Technical Paper Publication: IMECE2022-94580***Sky Papendorp - Kennesaw State University**Olukayode Iyun - Kennesaw State University**Christian Schneider - Kennesaw State University**Ayse Tekes - Kennesaw State University**Turaj Ashuri - Kennesaw State University**Amir Ali Amiri Moghadam - Kennesaw State University*

4:42PM

Improved Accuracy of Non-Contact Respiratory Function Measurement for Patients With Severe Motor and Intellectual Disabilities**Technical Paper Publication: IMECE2022-95552***Takumi Nakahama - Mie-University**Remi Kosumi - Mie University**Ryota Sakamoto - Mie University Hospital**Norihiko Kato - Mie University**Ken'ichi Yano - Mie University**Shotaro Iwamoto - Mie University Hospital**Tomohiro Tsujioka - Saiseikai Meiwa Hospital**Yuya Takahashi - Saiseikai Meiwa Hospital**Noriko Yamakawa - Saiseikai Meiwa Hospital***IMECE**[®]**ONE GREAT LEARNING EXPERIENCE.**
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TECHNICAL SESSIONS

MONDAY, OCTOBER 31

5:03PM**Deep Learning for Holographic Microwave Breast Imaging****Technical Paper Publication: IMECE2022-96335***Lulu Wang - Shenzhen Technology University***5:24PM****Heart Rate Monitoring Using Heart Acoustics****Technical Paper Publication: IMECE2022-96824***Aysha Mann - Mississippi State University**Jadyn Cook - Mississippi State University**Muneebah Umar - Mississippi State University**Fardin Khalili - Embry-Riddle Aeronautical University**Amirtahà Taebi - Mississippi State University***5-6: Dynamics and Control of Biomechanical Systems****05-06-01: Dynamics and Control of Biomechanical Systems****4:00PM–5:45PM - CONVENTION CENTER, A214/A215****4:00PM****The Dynamic and Control of a Robotic Platform for a Low-Cost Flight Simulator****Technical Paper Publication: IMECE2022-95166***Xiaoxu Ji - Gannon University**Ruba Alshaeri - Gannon University**Davide Piovesan - Gannon University**Kaden Conley - Gannon University***4:21PM****Effect of Liner Albedo on UVC Irradiation Control****Technical Paper Publication: IMECE2022-95797***Rachana Mamidi - Gannon University**Arvin Sharifbaev - Gannon University**Shivani P. Patel - Gannon University**Matthew Gacura - Gannon University**Gary Vanderlaan - Gannon University**Xiaoxu Ji - Gannon University**Davide Piovesan - Gannon University***4:42PM****Taxonomy of Robotic Climbing Mechanisms****Technical Paper Publication: IMECE2022-96057***Shubhankar Desai - Gannon University**Davide Piovesan - Gannon University***5:03PM****Multi-Objective Optimal Regulation of Glucose Level in Type I Diabetes Mellitus****Technical Paper Publication: IMECE2022-96348***Raya Abushaker - Jordan University of Science and Technology**Yousef Sardahi - Marshall University**Ahmad Alshorman - Jordan University of Science and Technology***5:24PM****Sagittal Plane Dynamic Model Using Tibiofemoral Articular Geometric Center and Experimental Tibiofemoral Center of Rotation to Predict Patellofemoral Joint Forces During Knee Extension Exercise****Technical Paper Publication: IMECE2022-95159***Jose M. Salinas - The University of Texas Rio Grande Valley**Dumitru Caruntu - The University of Texas Rio Grande Valley***IMECE**[®]**ONE GREAT LEARNING EXPERIENCE.**
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TECHNICAL SESSIONS

MONDAY, OCTOBER 31

05-15-03: General Topics in Biomedical and Biotechnology - III**4:00PM–5:45PM - CONVENTION CENTER, C160A****4:00PM****Implementing and Evaluating a Cost-Effective Optical Biosensor With Integrated Artificial Intelligence and Machine Learning****Technical Presentation: IMECE2022-98982***Ethan Regal - Gannon University**Pezhman Hassanpour - Gannon University***4:21 PM****Numerical Investigation of Finite Element Lower Extremity Model Response in Blast Loading****Technical Paper Publication: IMECE2022-94897***Aman Vikram - Indian Institute of Technology Delhi**Anoop Chawla - Indian Institute of Technology Delhi**Sudipto Mukherjee - Indian Institute of**Technology Delhi***4:42PM****Engagement State Definition and Detection in Education: A Review****Technical Paper Publication: IMECE2022-95597***Aurora Bocanumenth - EAFIT**Elizabeth Rendon-Velez - EAFIT***5:03PM****Effect of Fixations on Biomechanical Performance of Additively Manufactured Cranial Implants****Technical Presentation: IMECE2022-96227***Fariha Haque - The Ohio State University**Anthony F Luscher - The Ohio State University**Kerry-Ann Mitchell - The Ohio State University**Alok Sutradhar - The Ohio State University***IMECE**[®]**ONE GREAT LEARNING EXPERIENCE.**
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TECHNICAL SESSIONS

TUESDAY, NOVEMBER 1

TUESDAY, NOVEMBER 1

Track 5: Biomedical and Biotechnology
 Tuesday, November 1, 9:15AM-10:00AM
 Room: A214/A215
 Greater Columbus Convention Center

Title: The Many Contributions of the Mechanical Engineer to Medical Devices

Kendall R. Waters
Siemens Healthineers

5-4: Biomaterials and Tissue: Modelling, Synthesis, Fabrication, and Characterization

05-04-02: Biomaterials and Tissue: Modelling, Synthesis, Fabrication, and Characterization - I

10:15AM–12:00PM - CONVENTION CENTER, A221

10:15AM

A Microfabricated Sensor for Mechanical Testing of Active Biomaterials With Microscale Specimens Self-Assembled in Situ

Technical Presentation: IMECE2022-95811
Bashar Emon - University of Illinois at Urbana-Champaign
M. Taher A. Saif - University of Illinois at Urbana-Champaign

10:36AM

3D Nano-Biohybrid Carbon Nanotube Forest for Cardiac Tissue Engineering

Technical Presentation: IMECE2022-99216
Roya Bagheri - Michigan Technological University
Masoud Kasraie - Michigan Technological University
Alicia Ball - Michigan Technological University
Xinqian Chen - Michigan Technological University
Zhiying Shan - Michigan Technological University
Parisa Pour Shahid Saeed Abadi - Michigan Technological University

10:57AM

Appropriate Mode of Storage of Porcine Heart Myocardia Without Tempering With Its Passive Mechanical Properties

Technical Presentation: IMECE2022-99460
Harry Ngwangwa - University of South Africa
Fulufhelo Nemavhola - University of South Africa
Thanyani Pandelani - CSIR
Israel Mabuda - University of South Africa
Makhosasana Msibi - University of South Africa

11:18AM

Micro Bioreactor Array for Bio-Artificial Organ Development

Technical Presentation: IMECE2022-99613
Maciej Lewicki - Fairfield University
Sriharsha Sundarram - Fairfield University

05-12-01: Robotics, Rehabilitation - I

10:15AM–12:00PM - CONVENTION CENTER, A220

Session Chair: Ping Zhao - Hefei University of Technology
Session Co-Chair: Peyman Honarmandi - Manhattan College

10:15AM

Initial Testing of an Articulated Prosthetic Ankle

Technical Paper Publication: IMECE2022-87862
Michael Davidson - Loma Linda University
Noha Daher - Loma Linda University
Robert Dudley - Loma Linda University
Thomas Fryer - University California, Riverside
Johannes Schaepper - Loma Linda University
Duc Tran - Loma Linda University



TECHNICAL SESSIONS

TUESDAY, NOVEMBER 1

10:36AM**Investigating the Design of a Soft Robot for Finger Rehabilitation****Technical Paper Publication: IMECE2022-92663***Nina Glasgo - Seattle University**Mitchell Soohoo - Seattle University**Yen-Lin Han - Seattle University***10:57AM****Type X Robot: Theory and Practice for Revolution on Motor Learning****Technical Paper Publication: IMECE2022-93997***Danqing Zhang - University of Detroit Mercy**Jonathan Weaver - University of Detroit Mercy***11:18AM****Design and Realization of a Double Telescopic Arm End Effector for Multi Format Cell Container Handling Inside of Incubators****Technical Paper Publication: IMECE2022-94303***Valentin Ameres - Technical University Munich**Ismael Kostner - Technical University Munich**Lucas Artmann - Technical University Munich**Tim C. Lueth - Technical University Munich***05-01-02: Injury and Damage Biomechanics: Brain Response at the Cellular Level****10:15AM–12:00PM - CONVENTION CENTER, A216****10:15AM****Hyper-Viscoelastic 3D Response of Axons Subjected to Repeated Tensile Loads in Brain White Matter****Technical Paper Publication: IMECE2022-97059***Mohit Agarwal - Rutgers, The State University of New Jersey**Assimina Pelegri - Rutgers, The State University of New Jersey***10:36AM****Determination of Critical Cellular Traumatic Brain Injury Thresholds via in Vitro Mechanical Impacts and Deep Learning-Based Cell Phenotype Identification****Technical Presentation: IMECE2022-95179***Luke Summey - University of Wisconsin-Madison**Annalise Daul - University of Wisconsin-Madison**Jessica Park - University of Wisconsin-Madison**Jamie Sergay - University of Wisconsin-Madison**Jing Zhang - University of Wisconsin-Madison**Christian Franck - University of Wisconsin-Madison***10:57AM****Accelerative Loading on Neuron-Cell Embedded Head Phantom and Cell Response****Technical Presentation: IMECE2022-99999***Aurchie Rahman - The University of Texas at Arlington**Aaron Jackson - The University of Texas at Arlington**Arthur Koster - The University of Texas at Arlington**Rahid Zaman - The University of Texas at Arlington**Richie Ranaisa Daru - The University of Texas at Arlington**Saiful M Chowdhury - The University of Texas at Arlington**Ashfaq Adnan - The University of Texas at Arlington***11:18AM****Effect of Mechanical Stretch on the Action Potential Signal Conduction in Neuronal Axons****Technical Presentation: IMECE2022-100165***Md. Navid Imtiaz Rifat - The University of Texas at Arlington**Arthur Koster - The University of Texas at Arlington**Ashfaq Adnan - The University of Texas at Arlington***IMECE**[®]**ONE GREAT LEARNING EXPERIENCE.**
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TECHNICAL SESSIONS

TUESDAY, NOVEMBER 1

11:39AM

Viscoelastic Characterization of Spectrin Filament to Determine the Mechanical Injury Threshold for Dendrites in Neuron Cell

Technical Presentation: IMECE2022-100158

Md. Nahian Bin Hossain - The University of Texas at Arlington

Arthur Thomas Koster - The University of Texas at Arlington

Ashfaq Adnan - The University of Texas at Arlington

5-9: Computational Modeling in Biomedical Applications

05-09-02: Computational Modeling in Biomedical Applications - II

1:30PM–3:15PM - CONVENTION CENTER, A216

1:30PM

A Computational Parametric Design Approach for Orthopedic Implants Under Highly Nonlinear Conditions

Technical Paper Publication: IMECE2022-95176

Mandar Kulkarni - Stress Engineering Services, Inc.

Akshay Dandekar - Stress Engineering Services, Inc.

Mark Burchnall - Stress Engineering Services, Inc.

Ryan Dewall - DePuy Synthes Trauma

Joel Oberli - DePuy Synthes Trauma

1:51PM

Study of the Influence of Different Geometries of an Organ-on-a-Chip on Fluid Flow

Technical Paper Publication: IMECE2022-95391

Violeta Carvalho - University of Minho

Nelson Rodrigues - University of Minho

Raquel O. Rodrigues - University of Minho

José C. Teixeira - University of Minho

João Miranda - University of Porto

Rui A. Lima - University of Minho

Senhorinha Teixeira - University of Minho

2:12PM

An AI-Assisted Digital Twin for Studying the Risk of Vertebral Compression Fracture and Efficacy of the Vertebroplasty Procedure

Technical Presentation: IMECE2022-98862

Soheil Soghrati - The Ohio State University

Hossein Ahmadian - The Ohio State University

Prasath Mageswaren - The Ohio State University

Benjamin Walter - The Ohio State University

William Marras - The Ohio State University

Dukagjin Blakaj - The Ohio State University

Eric Bourekas - The Ohio State University

Ehud Mendel - Yale School of Medicine

2:33PM

Estimating Upper Extremity Muscle Activations Based on Muscle Synergy Analysis and EMG-Driven Modeling

Technical Presentation: IMECE2022-99522

Shadman Tahmid - Texas Tech University

James Yang - Texas Tech University

2:54PM

Obtaining All Material Sensitivities of a Biomechanical Model From a Single Simulation

Technical Presentation: IMECE2022-99535

Joseph Carter - Brigham Young University

Andrew Gibbons - Brigham Young University

Christopher Stubbs - Fairleigh Dickinson University

Eric Nauman - University of Cincinnati

Douglas Cook - Brigham Young University



TECHNICAL SESSIONS

TUESDAY, NOVEMBER 1

5-1: Injury and Damage Biomechanics**05-01-03: Injury and Damage Biomechanics:
Mechanisms Across the Body****1:30PM–3:15PM - CONVENTION CENTER, A221****1:30PM****Computational Motion and Finite Element Analysis of
ACL Strain Varying Tibial Topography****Technical Paper Publication: IMECE2022-94831**

Ariful Bhuiyan - University of Houston–Clear Lake
William Amonette - University of Houston–Clear Lake
Joseph Hazzard - University of Houston–Clear Lake
Edgar Castillo - University of Houston–Clear Lake

1:51PM**Challenges of Using High-Speed Film From Historical
Sled Impact Acceleration Tests in the Analysis of
Head Flail Kinematics****Technical Paper Publication: IMECE2022-89198**

*Ardyn Olszko - U.S. Army Aeromedical
Research Laboratory*
*Alicia Abraczinskas - U.S. Army Aeromedical
Research Laboratory*
*Shannon Mcgovern - U.S. Army Aeromedical
Research Laboratory*
*Allison Robinette - U.S. Army Aeromedical
Research Laboratory*
*Kimberly Vasquez - U.S. Army Aeromedical
Research Laboratory*
*Valeta Carol Chancey - U.S. Army Aeromedical
Research Laboratory*
*Frederick Brozoski - U.S. Army Aeromedical
Research Laboratory*

2:12PM**Far-Side Vehicular Impacts: Injury Prevention Design
Considerations****Technical Presentation: IMECE2022-99479**

Michael Markushewski - ARCCA Inc.
Julie Landes - ARCCA Inc.

2:33PM**Biomechanical Response of a Foam-Based Lung
Surrogate Subjected to Underwater Shock Loading****Technical Presentation: IMECE2022-99445**

Feng Zhu - Johns Hopkins University
Kael Kinney - Johns Hopkins University
Zhiqing Chen - Innovision, LLC

2:54PM**In Vivo Model of Behind-Armor Blunt Trauma to
Study the Effects of Impact Velocity and Chest
Deformation on Lung Injury****Technical Presentation: IMECE2022-96577**

Kurosh Darvish - Temple University
Soroush Assari - Temple University
Jacob Erdlen - Temple University
Jacqueline Lynch - Temple University
Jordan Bobrove - Temple University
Hiromu Kehara - Temple University
Mariola Marcinkiewicz - Temple University
Karin Rafaels - U.S. Army Research Laboratory
Erika Matheis - Bennett Aerospace, Inc.
Michael Kleinberger - U.S. Army Research Laboratory
Marla R. Wolfson - Temple University



TECHNICAL SESSIONS

TUESDAY, NOVEMBER 1

05-05-02 Biomedical Devices - II

1:30PM–3:15PM - CONVENTION CENTER, A220

1:30PM

Finite Element Crash Simulation and Analysis of Drop Tests to Improve the Mechanical Design of a Handheld Dispersive QSTM Medical Device

Technical Paper Publication: IMECE2022-95786

Abhinaba Bhattacharjee - Indiana University–Purdue University Indianapolis

Terry Loghmani - Indiana University–Purdue University Indianapolis

Sohel Anwar - Indiana University–Purdue University Indianapolis

1:51PM

A Time-Dependent Two Species Explicit Finite Difference Computational Model for Analyzing Diffusion in a Drug Eluting Stented Coronary Artery Wall: A Phase I Study

Technical Paper Publication: IMECE2022-95803

Maegan Edwards - The University of North Carolina at Charlotte

John Kizito - North Carolina A&T State University

Rodward Hewlin - The University of North Carolina at Charlotte

2:12PM

Mechanical Orthosis for Knee Osteoarthritis Patients to Correct Internal Knee Joint Warping and Achieve Normal Knee Joint Rotation Motion

Technical Paper Publication: IMECE2022-96109

Kazuma Kubota - Mie University

Go Katsube - Mie University

Song Qi - Mie University

Ken'ichi Yano - Mie University

Naruki Matsui - Meikou Brace Corporation

Nobuyuki Shinoda - Meikou Brace Corporation

2:33PM

Integration of Minivalves With RNA Amplification Device for Simultaneous Detection of SARS-CoV-2 and Influenza Viruses

Technical Paper Publication: IMECE2022-96831

Morteza Alipanah - University of Florida

Carlos Manzanos - University of Florida

John A. Lednicky - University of Florida

Chang-Yu Wu - University of Florida

Z. Hugh Fan - University of Florida

2:54PM

Manufacturing Realistic Cerebrovascular Replica With an Intracranial Aneurysm and Their Application to Neurointerventional Endovascular Simulation

Technical Presentation: IMECE2022-99261

Yeonwoo Kim - Hanyang University

Je Hoon Oh - Hanyang University

Kwang-Chun Cho - Yongin Severance Hospital, Yonsei University College of Medicine

Jung-Jae Kim - Severance Hospital, Yonsei University College of Medicine

Hyeondong Yang - Hanyang University

5-10: Musculoskeletal and Sports Biomechanics

05-10-02: Musculoskeletal and Sports Biomechanics - II

3:30PM–5:15PM - CONVENTION CENTER, A220

3:30PM

Analysis of a Stationary Bicycle

Technical Paper Publication: IMECE2022-97118

Ryan Truhn - Manhattan College

Parisa Saboori - Manhattan College

Graham Walker - Manhattan College



TECHNICAL SESSIONS

TUESDAY, NOVEMBER 1

3:51PM**Development of a Custom Hybrid Neck Model to Study Traumatic Brain Injury****Technical Presentation: IMECE2022-100154***Rahid Zaman - The University of Texas at Arlington**Richie Ranaisa Daru - The University of Texas at Arlington**Aaron Jackson - The University of Texas at Arlington**Arthur Koster - The University of Texas at Arlington**Ashfaq Adnan - The University of Texas at Arlington***4:12PM****Finite Element Modeling of Football Helmet Foams to Maximize Energy Absorption Against Impacts****Technical Paper Publication: IMECE2022-97140***Peyman Honarmandi - Manhattan College**Andrea Ceriati - Manhattan College***4:33PM****Understanding Physiological Changes in the Muscle in Compartment Syndrome****Technical Paper Publication IMECE2022-97125***Veronica Caruso - Manhattan College**Parisa Saboori - Manhattan College**Graham Walker - Manhattan College***5-11: Sensors and Actuators****05-11-02: Sensors and Actuators - II****3:30PM–5:15PM - CONVENTION CENTER, A216****3:30PM****An Open-Source, Wireless, Portable, Potentiostat for the Point-of-Care Detection of S100b in Plasma Samples****Technical Presentation: IMECE2022-99428***Francisco Burgos - Universidad Simón Bolívar**Alexander Rodriguez - Universidad del Norte**Eliana Cervera - Universidad del Norte**Marco Sanjuan - Promigas**Pedro Villalba - Universidad del Norte***3:51PM****Real-Time Optimization of Body Alignment for Wearable Sensors in Human Motion Measurement****Technical Presentation: IMECE2022-99761***Abenezer Sirak Alemu - University of Pittsburgh**William Clark - University of Pittsburgh***4:12PM****Determination of the Threshold of Residue Hematocrit in Separated Blood Plasma Using Capacitance Measurements With Interdigitated Electrodes for Robust Biomarker Detection****Technical Presentation: IMECE2022-99987***Siddhant Jadhav - University of Illinois at Urbana-Champaign**Yudong Wang - New Jersey Institute of Technology**Bharath Babu Nunna - Weber State University**Jinhyeok Bae - New Jersey Institute of Technology**Eon Soo Lee - New Jersey Institute of Technology***4:33PM****Sensing Rhythmic Brain Signals Inside a Phantom Head Using EEG****Technical Presentation: IMECE2022-100167***Richie Ranaisa Daru - The University of Texas at Arlington**Kristin Tighe - The University of Texas at Arlington**Ashfaq Adnan - The University of Texas at Arlington***IMECE**[®]**ONE GREAT LEARNING EXPERIENCE.**
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TECHNICAL SESSIONS

WEDNESDAY, NOVEMBER 2

WEDNESDAY, NOVEMBER 2

5-1: Injury and Damage Biomechanics

05-01-04: Injury and Damage Biomechanics: Spine and Vertical Loading

10:45AM–12:30PM - CONVENTION CENTER, A214/A215

10:45AM

The Effect of Anatomical Variations on Male and Female Lumbar Spine Loads During Vertical Impacts

Technical Paper Publication: IMECE2022-96169

Sagar Umale - Medical College of Wisconsin

Prashant Khandelwal - Medical College of Wisconsin

John Humm - Medical College of Wisconsin

Narayan Yoganandan - Medical College of Wisconsin

11:06AM

Human Tolerance to Injury Under Complex Head-Neck Loading

Technical Paper Publication: IMECE2022-95731

Narayan Yoganandan - Medical College of Wisconsin

John Humm - Medical College of Wisconsin

Jamie Baisden - Medical College of Wisconsin

Vicky Varghese - Medical College of Wisconsin

Anjishnu Banerjee - Medical College of Wisconsin

11:27AM

Evaluating Pelvis Response During Simulated Underbody Blast Loading

Technical Paper Publication: IMECE2022-95913

Thanyani Pandelani - CSIR

Diagarajen Carpanen - Imperial College London

Spyros Masouros - Imperial College London

11:48AM

Reclined Pelvis-Lumbar Spine Postural Responses in Vertical Impact

Technical Presentation: IMECE2022-99892

Narayan Yoganandan - Medical College of Wisconsin

Jason Moore - Medical College of Wisconsin

John Humm - Medical College of Wisconsin

Jamie Baisden - Medical College of Wisconsin

Frank Pintar - Medical College of Wisconsin

David Barnes - Survice Engineering Company

Kathryn Loftis - DEVCOM Data Analysis Center

12:09PM

Patient-Specific Cervical Spinal Column and Spinal Cord Finite Element Modeling Using MRI: Implications for Treatment and Injury Prediction

Technical Presentation: IMECE2022-100083

Aditya Vedantam - Medical College of Wisconsin

Yuvaraj Purushothman - Medical College of Wisconsin

Balaji Harinathan - Medical College of Wisconsin

Stephen Scripp - Milwaukee School of Engineering

Matthew Budde - Medical College of Wisconsin

Narayan Yoganandan - Medical College of Wisconsin

5-9: Computational Modeling in Biomedical Applications

05-09-03: Computational Modeling in Biomedical Applications - III

10:45AM–12:30PM - CONVENTION CENTER, A216

10:45AM

Influence of the Inlet Velocity in Oxygen Gradients in a Liver-on-a-Chip Model



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TECHNICAL SESSIONS

WEDNESDAY, NOVEMBER 2

Technical Paper Publication: IMECE2022-96001

Violeta Carvalho - University of Minho
Nelson Rodrigues - University of Minho
Raquel O. Rodrigues - University of Minho
José C. Teixeira - University of Minho
João Miranda - University of Porto
Rui A. Lima - University of Minho
Senhorinha Teixeira - University of Minho

11:06AM**Modeling Airflow Dynamics in Trachea Due to Tumor Compression****Technical Presentation: IMECE2022-96067**

Alok Sutradhar - The Ohio State University
Tareq Zobaer - The Ohio State University

11:27AM**A Steered Molecular Dynamics Study of Unbinding of Ritonavir and xk263 From HIV-1 Protein Binding Pocket****Technical Presentation: IMECE2022-99053**

Mohammad Akram - Lehigh University
Tanumoy Banerjee - Lehigh University
Ganesh Balasubramanian - Lehigh University

11:48AM**A Steered Molecular Dynamics Study of Unbinding of Human Cell Receptors From SARS CoV-2 Viral Protein Receptor Binding Site****Technical Presentation: IMECE2022-99129**

Tanumoy Banerjee - Lehigh University
Agnivo Gosai - Corning Inc.
Niloofar Yousefi - University of Central Florida
Craig Neal - University of Central Florida
Elyaraja Kolnathai - University of Central Florida
Ozlem Garibay - University of Central Florida
Sudipta Seal - University of Central Florida
Ganesh Balasubramanian - Lehigh University

12:09PM**Investigation of Combined Influence of Hemodynamic Parameters on Intracranial Aneurysm Formation by Performing Computer-Simulations on Aneurysmal and Non-Aneurysmal Paraclinoid Arteries****Technical Presentation: IMECE2022-99146**

Hyeondong Yang - Hanyang University
Jung-Jae Kim - Severance Hospital, Yonsei University College of Medicine
Yong Bae Kim - Severance Hospital, Yonsei University College of Medicine
Kwang-Chun Cho - Yongin Severance Hospital, Yonsei University College of Medicine
Je Hoon Oh - Hanyang University

5-12: Robotics, Rehabilitation**05-12-02: Robotics, Rehabilitation - II****2:00PM–3:45PM - CONVENTION CENTER, A214/A215****2:00PM****Testing of a Robotic Prosthetic Leg****Technical Paper Publication: IMECE2022-95215**

Michael Davidson - Loma Linda University
Noha Daher - Loma Linda University
Thomas Fryer - University of California, Riverside
Robert Dudley - Loma Linda University
Johannes Schaepper - Loma Linda University
Duc Tran - Loma Linda University

2:21PM**The Design Evolution of a Lower Extremity Exoskeleton Device for Leg Muscle Rehabilitation**

TECHNICAL SESSIONS

WEDNESDAY, NOVEMBER 2

Technical Paper Publication: IMECE2022-95818*Patrick Fusilero - San Jose State University**Andres Reyes - San Jose State University**Rodrigo Trejo - San Jose State University**Indeever Madireddy - Intelliscience Institute**Aayush Vemuri - Intelliscience Institute**Soahil Zaidi - Intelliscience Institute**Vimal Viswanathan - San Jose State University***2:42PM**

On the Development and Evaluation of a Framework for Brain-Computer Interface and Vibrotactile Feedback for Human-Robot-Interaction in Virtual Spaces and Robotic Hardware

Technical Paper Publication: IMECE2022-95828*Sudip Hazra - The University of Texas at Arlington**Shane Whitaker - The University of Texas at Arlington**Panos. S. Shiakolas - The University of Texas at Arlington**at Arlington***3:03PM**

A Microrobot With an Attached Micro-Force Sensor for Natural Orifice Access to the Bladder Interior Wall

Technical Paper Publication: IMECE2022-95988*Samson Adejokun - The University of Texas at Arlington**at Arlington**Shashank Kumat - The University of Texas at Arlington**Panos Shiakolas - The University of Texas at Arlington***5-1: Injury and Damage Biomechanics****05-01-05: Injury and Damage Biomechanics: Wearables and Associated Studies****2:00PM–3:45PM - CONVENTION CENTER, A216****2:00PM**

The Effect of Laboratory Filter Levels for Assessing Instrumented Mouthguard Kinematic Accuracy With a NOCSAE Headform

Technical Paper Publication: IMECE2022-95845*Brandon Brown - Katmai Health Services**Ray Daniel - Katmai Health Services**Adam Bartsch - Prevent Biometrics**Tyler Rooks - U.S. Army Aeromedical Research Laboratory***2:21PM**

Mouthguard Denoising With One-Dimensional Convolutional Neural Network for Accurate Brain Strain Calculation

Technical Presentation: IMECE2022-88863*Xianghao Zhan - Stanford University**Yuzhe Liu - Stanford University**Olivier Gevaert - Stanford University**David Camarillo - Stanford University***2:42PM**

Acceleration-Induced Brain Injury Sensing: A Combined Experimental and Computational Study With Phantom Head Models

Technical Presentation: IMECE2022-99871*Aaron Jackson - The University of Texas at Arlington**Arthur Koster - The University of Texas at Arlington**Richie Daru - The University of Texas at Arlington**Aurchie Rahman - The University of Texas at Arlington**Rahid Zaman - The University of Texas at Arlington**Ashfaq Adnan - The University of Texas at Arlington***3:03PM**

Injury Model Estimates Based on Person-Borne Multiple Overpressure Measurements From a Single Device

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TECHNICAL SESSIONS

WEDNESDAY, NOVEMBER 2

Technical Presentation: IMECE2022-99637

Jean-Philippe Dionne - Med-Eng
Aris Makris - Med-Eng
Doug Wong - Med-Eng

3:24PM**Verification and Validation of an Open-Source Multiscale Brain Modeling Platform****Technical Presentation: IMECE2022-99705**

Ritika Menghani - The Pennsylvania State University
Reuben Kraft - The Pennsylvania State University
Anil Das - The Pennsylvania State University

5-14: Biotechnology and General Applications**05-14-01: Biotechnology and General Applications****4:00PM–5:45PM - CONVENTION CENTER, A216****4:00PM****Compression Energy Stored in an Additively Manufactured Mesostructure****Technical Paper Publication: IMECE2022-88493**

Anne Schmitz - University of Wisconsin-Stout

4:21PM**Manufacturing and Characterization of Nanocomposites With Antibacterial Nanoparticles****Technical Paper Publication: IMECE2022-94218**

Christopher Billings - The University of Oklahoma
Peter Kim - The University of Oklahoma
Changjie Cai - The University of Oklahoma
Yingtao Liu - The University of Oklahoma

4:42PM**Fabrication and Testing of Asymmetric Magnetic-Polymer Flexible Sheets for Biomedical Actuated Devices****Technical Paper Publication: IMECE2022-95020**

Maurizio Manzo - University of North Texas
Megha Bakaraju - University of North Texas

5:03PM**Effect of UV Curing Parameters on Warp in the SLA Printing Process****Technical Paper Publication: IMECE2022-88495**

Anne Schmitz - University of Wisconsin-Stout

5:24PM**Engagement State Definition and Detection in Education: A Review****Technical Paper Publication: IMECE2022-95597**

Aurora Bocanumenth - Universidad EAFIT
Elizabeth Rendon-Velez - Universidad EAFIT

5-3: Biomedical Imaging, Therapy and Tissue Characterization**05-03-01: General Topics in Biomedical and Biotechnology Covering: Biomedical Imaging, Therapy, and Tissue Characterization; Clinical Applications of Bioengineering****4:00PM–5:45PM - CONVENTION CENTER, A214/A215****IMECE**[®]

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TECHNICAL SESSIONS

WEDNESDAY, NOVEMBER 2

4:00PM

Contribution of Piezo1 in ECM Stiffness Incited Epithelial Cell Remodeling

Technical Paper Publication: IMECE2022-95032

Deekshitha Jetta - University at Buffalo

Tasnim Shireen - University at Buffalo

Rajath D. Prabhu - University at Buffalo

Susan Z. Hua - University at Buffalo

4:21PM

Evaluation of Delay of a Teleultrasound Robotic System for Musculoskeletal Imaging

Technical Paper Publication: IMECE2022-96862

Adriana Paola Noguera Cundar - University of Saskatchewan

Reza Fotouhi - University of Saskatchewan

Zachary Ochitwa - University of Saskatchewan

4:42PM

Early Detection of Brain Damage After Trauma Using an Innovative Cysteamine-Based Immunosensor for the Highly Sensitive Quantification of the Blood Biomarker S100b

Technical Presentation: IMECE2022-99427

Alexander Rodríguez - Universidad del Norte and Universidad Metropolitana

Francisco Burgos - Universidad Simón Bolívar

Pedro Villalba - Universidad del Norte

Eliana Cervera - Universidad del Norte

5:03PM

Fabrication of Photonic Microlasers via Microfluidic Double Emulsion

Technical Paper Publication: IMECE2022-95994

Jayanth Pandit - University of North Texas

Bhanuprakash Kunam - University of North Texas

Omar Cavazos - University of North Texas

Maurizio Manzo - University of North Texas



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TECHNICAL SESSIONS

TUESDAY, NOVEMBER 1

Track 6: Design, Systems and Complexity Sponsored by the Computers & Information in Engineering Division

Topics:

- 6-1: Product and Process Design
- 6-2: CAD, CAE and CAM
- 6-3: Optimization
- 6-4: Design for Additive Manufacturing
- 6-5: Human Modelling for Product Design and Manufacturing
- 6-6: Smart Cyber-Physical Systems Design
- 6-7: Sustainability and Context Aware Design

ACKNOWLEDGMENT TRACK ORGANIZERS

Track Organizer: Miri Weiss-Cohen

Track Co-Organizer: Marco Rossoni

Track Co-Organizer: SZ HO KWOK

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Anders Robertsson, Lund University

Andrea Petruccioli, Università di Modena e Reggio Emilia

Daniele Landi, Università degli Studi di Bergamo

Fabio Pini, Università di Modena e Reggio Emilia

Frederico Gadelha Guimaraes, Universidade Federal de Minas Gerais

Gunther Paul, Australian Institute of Tropical Health and Medicine

Marco Mandolini, Università Politecnica delle Marche

Marta Rossi, Università Politecnica delle Marche

Po Ting Lin, National Taiwan University of Science and Technology

Rodrigo César Pedrosa Silva, Universidade Federal de Ouro Preto

Sofia Scatagliini, Universiteit of Antwerpen

Tuomas Puttonen, Aalto University

Yan Wang, Georgia Institute of Technology

SESSION ORGANIZERS

Arpan Biswas - Oak Ridge National Laboratory

Daniele Regazzoni - University of Bergamo

Dingzhi Zhang - Technical University of Munich

Fabio Pini - University of Modena and Reggio Emilia

Krisitna Hughes - United States Military Academy

Marco Mandolini - Università Politecnica delle Marche

Marco Rossoni - Politecnico di Milano

Maria Redoutey - University of Michigan

Miri Weiss Cohen - Braude College of Engineering

Samuel Schoedel - Virginia Tech

Stephen Idem - Tennessee Tech University

Yanzhou Wang - Johns Hopkins University

TRACK 6

TUESDAY, NOVEMBER 1

Track 6: Design, Systems and Complexity

Tuesday, November 1, 9:15AM-10:00AM

Room: A216

Greater Columbus Convention Center

**Title: Projection-based Additive Manufacturing:
Spatiotemporal Properties and Data-Driven Image
Planning Methods**

Yong Chen

University of Southern California

06-02-01 CAD/CAM

10:15AM–12:00PM - CONVENTION CENTER, A222

10:15AM

Evaluation of Needle Driver Designs for Robot-Assisted Needle Insertions Under MRI Guidance



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TECHNICAL SESSIONS

TUESDAY, NOVEMBER 1

Technical Paper Publication: IMECE2022-96678

Guanyun Liu - Johns Hopkins University
Yanzhou Wang - Johns Hopkins University
Gang Li - Sheikh Zayed Institute for Pediatric Surgical Innovation
Kevin Cleary - Sheikh Zayed Institute for Pediatric Surgical Innovation
Lulian Lordachita - Johns Hopkins University

10:36AM**Design of a Versatile Slip Resistance Tester Mimicking Foot Kinematics and Kinetics During Human Slip**

Technical Presentation: IMECE2022-94412
Md. Javed Imtiaz Khan - Texas State University
Meysam Khaleghian - Texas State University
Anahita Emami - Texas State University

10:57AM**Optimization of Parameters for Customized Knee Implants**

Technical Paper Publication: IMECE2022-95080
Anna Ghidotti - University of Bergamo
Daniele Landi - University of Bergamo
Daniele Regazzoni - University of Bergamo
Caterina Rizzi - University of Bergamo

11:18AM**An Automation Toolbox for Nonlinear Finite Element Analysis of Rotary Shouldered Threaded Connections**

Technical Paper Publication: IMECE2022-96108
Fei Song - Schlumberger
Ke Li - Schlumberger

11:39AM**Shape Modeling of Potential Sink Marks for Assisting Aesthetic Design of Plastic Parts**

Technical Paper Publication IMECE2022-96189
Masatomo Inui - Ibaraki University
Nobuyuki Umezu - Ibaraki University

06-01-02 Product And Process Design**1:30PM–3:15PM - CONVENTION CENTER, A222****1:30PM****Outdoor System for Synchronous Triggering of Multiple Scientific Cameras Using Direct-Access GNSS Time Transfer**

Technical Paper Publication: IMECE2022-95393
Marko Bjelotomic - Dubai Electricity & Water Authority
Prashanth Subramaniam - Dubai Electricity & Water Authority
Oginne Rashid Lapuz - Dubai Electricity & Water Authority
Khuloud Almaeeni - Dubai Electricity & Water Authority
Mohammed Minhas Anzil - Dubai Electricity & Water Authority
Sidi Ahmed Bendoukha - Dubai Electricity & Water Authority
Luis Pomares - Dubai Electricity & Water Authority



TECHNICAL SESSIONS

TUESDAY, NOVEMBER 1

1:51PM**An Analytical Vehicle Kano Model Development Using QFD Method****Technical Paper Publication: IMECE2022-95644***Chang Liu - Shandong Jianzhu University**Jiaquan Chen - FAW Group**Yin-ping Chang - Oakland University***2:12PM****Development of an Affordable and Modular 3D Printed Quadruped Robot****Technical Paper Publication: IMECE2022-95700***Samuel Schoedel - Virginia Polytechnic Institute and State University**Alexander Fuge - Virginia Polytechnic Institute and State University**Bhaben Kalita - Virginia Polytechnic Institute and State University**Alexander Leonessa - Virginia Polytechnic Institute and State University***2:33PM****The Design of an Open Source 3D Printable Humanoid Robotic Hand (Chuchu)****Technical Paper Publication: IMECE2022-95905***Joseph Harling - Wentworth Institute of Technology**Eric Yeh - Wentworth Institute of Technology**Gloria Ma - Wentworth Institute of Technology**James Mccusker - Wentworth Institute of Technology**Filip Cuckov - Wentworth Institute of Technology***2:54PM****Ontology-Based Framework for Knowledge-Based Lifecycle Management of Product Information****Technical Paper Publication: IMECE2022-94837***Lorenzo Failla - Baker Hughes**Marco Rossoni - Politecnico di Milano**Michele Vallesi - Baker Hughes**Giorgio Colombo - Politecnico di Milano***6-4: Design for Additive Manufacturing****06-04-01 Design for AM****3:30PM–5:15PM - CONVENTION CENTER, A221****3:30PM****Manual Tasks Real-Time Ergonomic Evaluation for Collaborative Robotics****Technical Paper Publication: IMECE2022-95556***Daniel Lanzoni - University of Bergamo**Andrea Vitali - University of Bergamo**Daniele Regazzoni - University of Bergamo**Caterina Rizzi - University of Bergamo***3:36PM****Investigation for the Dimensional Accuracy of Additively Manufactured High Temperature Material (PEEK) for Spare Parts Applications****Technical Paper Publication: IMECE2022-95692***Saleh Atatreh - Dubai Electricity & Water Authority**Mozah Saeed Alyammahi - Dubai Electricity & Water Authority**Rahmat Agung Susantyoko - Dubai Electricity & Water Authority**Abdallah Mohammed - Dubai Electricity & Water Authority***3:57PM****Techno-Economic Analysis for Evaluating the Adoption of Additive Manufacturing for Wax Pattern Manufacturing****Technical Paper Publication: IMECE2022-96658***Marco Mandolini - Università Politecnica delle Marche**Mikhailo Sartini - Università Politecnica delle Marche**Claudio Favi - Università di Parma**Michele Germani - Università Politecnica delle Marche***IMECE**[®]**ONE GREAT LEARNING EXPERIENCE.**
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TECHNICAL SESSIONS

WEDNESDAY, NOVEMBER 2

4:18PM**Analysis of the Stiffness of Metal 3D Additive Manufacturing Spacer Grids****Technical Presentation: IMECE2022-99807***Yonghwi Kim - Sungkyunkwan University**Uijeong Ro - Sungkyunkwan University**Sangyeop Kim - Sungkyunkwan University**Moon Ki Kim - Sungkyunkwan University***4:39PM****Additive Remanufacturing Integrated Design Approach for Performance Improvement of Automotive Components****Technical Paper Publication: IMECE2022-97144***Enrico Dalpadulo - University of Modena and Reggio Emilia**Fabio Pini - University of Modena and Reggio Emilia**Francesco Leali - University of Modena and Reggio Emilia***5:00PM****Requirements Elicitation: Impacts of Gamification on Variety, Novelty, and Completeness****Technical Paper Publication: IMECE2022-96016***Vinayak Khade - Clemson University**Nafiseh Masoudi - Clemson University**Dane Acena - Clemson University**Guo Freeman - Clemson University**Rahul Rai - Clemson University**David Gorsich - US Army DEVCOM Ground Vehicle Systems Center**Denise Rizzo - US Army DEVCOM Ground Vehicle Systems Center**Matt Castanier - US Army DEVCOM Ground Vehicle Systems Center***WEDNESDAY, NOVEMBER 2****6-1: Product and Process Design****06-01-01 Product And Process Design****10:45AM–12:30PM - CONVENTION CENTER, D182****10:45AM****Dynamic Design of Machines Sub-Assemblies: A New Original Approach****Technical Presentation: IMECE2022-89080***Pierre Dupont - Schaeffler Group - Faculté Polytechnique de MONS***11:06AM****Understanding the Expected Deformation of Rectangular Ductwork****Technical Paper Publication: IMECE2022-90097***Cameron Schaff - Bennett & Pless**Matthew Crispi - Tower Engineering Professionals**Jane Liu - Tennessee Tech University**John Peddieson - Tennessee Tech University**Stephen Idem - Tennessee Tech University***11:27AM****Technical Cost Methodology Applied to the Design of Gas Turbine Components****Technical Paper Publication: IMECE2022-91408***Emanuele Checcacci - Baker Hughes - Nuovo Pignone Tecnologie SRL**Irene Martinelli - Baker Hughes - Nuovo Pignone Tecnologie SRL**Giacomo Ragni - Baker Hughes - Nuovo Pignone Tecnologie SRL*

TECHNICAL SESSIONS

WEDNESDAY, NOVEMBER 2

11:48AM**Methodology for Integrating Biomimetic Beams in Abstracted Topology Optimization Results****Technical Paper Publication: IMECE2022-94299***Tim Röver - Hamburg University of Technology**Robert Johannes Lau - Fraunhofer Research Institution for Additive Manufacturing Technologies IAPT**Fritz Lange - Fraunhofer Research Institution for Additive Manufacturing Technologies IAPT**Arnd Struve - Fraunhofer Research Institution for Additive Manufacturing Technologies IAPT**Cedrik Fuchs - Fraunhofer Research Institution for Additive Manufacturing Technologies IAPT**Katharina Bartsch - Hamburg University of Technology**Arthur Seibel - Fraunhofer Research Institution for Additive Manufacturing Technologies IAPT**Claus Emmelmann - Hamburg University of Technology***12:09PM****Non-Linear Analysis of Beam-Reinforced Thin Plates for Modeling Rectangular Duct Systems****Technical Paper Publication: IMECE2022-90109***Matthew Crispi - Tower Engineering Professionals**Jane Liu - Tennessee Tech University**John Peddieson - Tennessee Tech University**Stephen Idem - Tennessee Tech University***6-3: Optimization****06-03-01 Optimization****2:00PM–3:45PM - CONVENTION CENTER, D182****2:00PM****Benefit of Optimal Actuator Selection: A Comparative Study****Technical Paper Publication: IMECE2022-94890***Pavlos Hanna - University of Technology, Sydney**Marc Carmichael - University of Technology, Sydney**Lee Clemon - University of Technology, Sydney***2:21PM****A Latent Bayesian Optimization Approach in High Dimensional Hyperparameter Optimization of Unsupervised Joint (Rotationally-Invariant) Variational Auto-Encoder****Technical Presentation: IMECE2022-98299***Arpan Biswas - Oak Ridge National Laboratory**Sergei V. Kalinin - The University of Tennessee**Maxim Ziatdinov - Oak Ridge National Laboratory***2:42PM****Sequential Linear Programming Based L1-Norm Minimization and Its Applications****Technical Presentation: IMECE2022-99326***Wei Zhao - Oklahoma State University***3:03PM****Continuous Equilibrium Structures Under Gravity in Any Orientation****Technical Presentation: IMECE2022-100039***Maria Redoutey - University of Michigan**Evgueni Filipov - University of Michigan***3:24PM****Study on Heat Resistance of PLA Based Biodegradable Injection Molded Components****Technical Paper Publication: IMECE2022-88662***Can Yang - Shenzhen Technology University**Ruifeng Chen - Shenzhen Technology University**Jianzhong Xie - Bao De Shi (Shen Zhen) Limited**Zuguang Ding - Bao De Shi (Shen Zhen) Limited**Yang Shu - Shenzhen Technology University**Xiao-Hong Yin - Shenzhen Technology University***IMECE**[®]**ONE GREAT LEARNING EXPERIENCE.**
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TECHNICAL SESSIONS

WEDNESDAY, NOVEMBER 2

6-7: Sustainability and Context Aware Design**06-07-01- Sustainable Design****4:00PM–5:45PM - CONVENTION CENTER, D182****4:00PM**

Design and Implementation of End-User Pipeline Supply Systems of Water and City-Gas by Applying Dx Technology

Technical Paper Publication: IMECE2022-88430

Masaaki Hashimoto - Graduate School of System Engineering Management

Yoshiaki Ohkami - Keio University

4:21PM**Autonomous Aerial Supply Delivery****Technical Paper Publication: IMECE2022-93895**

Kristina Hughes - United States Military Academy

Katherine King - United States Military Academy

Shane Hickman - United States Military Academy

August Rannow - United States Military Academy

Gregory Freisinger - United States Military Academy

Stewart Huntoon - United States Military Academy

Ekaterina Kuhlwein - U.S. Army Combat Capabilities Development Command

Benjamin Rooney - U.S. Army Combat Capabilities Development Command

4:42PM**Supply Chain as a Complex System: Environmental Impact Evaluation and Perception****Technical Paper Publication: IMECE2022-95030**

Federica Cappelletti - Università Politecnica delle Marche

Roberto Menghi - Università Politecnica delle Marche

Marta Rossi - Università Politecnica delle Marche

Michele Germani - Università Politecnica delle Marche

5:03PM**Dynamic Assessment of Lidar Imaging Systems for Autonomous Vehicles in Adverse Weather Conditions****Technical Paper Publication: IMECE2022-96259**

Jamil Abdo - Frostburg State University

Luke Russell - University of Maryland, College Park

James Mills - University of Maryland, College Park

Taylor Frailey - Frostburg State University

Genshe Chen - Intelligent Fusion Technology, Inc.

5:24PM**Automated Digitalization of 3D Structures Using AprilTag and SG-Library in Matlab****Technical Paper Publication: IMECE2022-90352**

Dingzhi Zhang - Technical University of Munich

Felix Pancheri - Technical University of Munich

Christoph Rehekampff - Technical University of Munich

Yilun Sun - Technical University of Munich

Tim C. Lueth - Technical University of Munich



TECHNICAL SESSIONS

Track 7: Dynamics, Vibration, and Control Sponsored by the Design Engineering and Applied Mechanics Divisions

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: Modelling and Design Advances of Rotating Structures
- 7-20: Congress-Wide Symposium on NDE & SHM: Dynamics, Vibration, and Control for Structural Health Monitoring Applications
- 7-21: Congress-Wide Symposium on Advanced Research in Marine and Aerospace Lifting Surfaces
- 7-22: Industrial Applications in Dynamics, Vibrations and Control
- 7-23: 100th Anniversary of the Timoshenko-Ehrenfest Beam Model

ACKNOWLEDGMENT TRACK ORGANIZERS

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Track Co-Organizer: Eleonora Tubaldi

Track Co-Organizer: Marco Amabili

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Amin Ghadami, University of Michigan

Amir Ali Amiri Moghadam, Kennesaw State University

Bill Prescott, Siemens Product Life Cycle Management

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Brian Painter, Framatome Inc.

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Dale McDonald, Angelo State University

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Isaac Elishakoff, Florida Atlantic University,

Konstantin Matveev, Washington State University



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Kostas Karazis, Framatome Inc

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Tong University Joint Institute*

Yu Guo, Midwestern State University

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Zhenhua Tian, Mississippi State University

Zhibin Lin, North Dakota State University

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Akin Tatoglu - University of Hartford

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Bogdan Epureanu - - University of Michigan

Brian Painter - AREVA Inc.

C. Steve Suh - Texas A&M University

Dale McDonald - Angelo State University

Daniel Segalman

Dumitru Caruntu - University of Texas - Rio Grande Valley

Eleonora Tubaldi - University of Maryland

Firas Khasawneh - Michigan State University

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Isaac Elishakoff - Florida Atlantic University

Luca Bruzzone - DIMEC - Università degli Studi di Genova

Majura Selekwa - North Dakota State University

Marco Amabili - McGill University

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Sohel Anwar - Indiana University - Purdue University

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Yuris Dzenis - University Of Nebraska–Lincoln

Zhenhua Tian - Mississippi State University

Zhibin Lin - North Dakota State University



TECHNICAL SESSIONS

TUESDAY, NOVEMBER 1

TRACK 7

TUESDAY, NOVEMBER 1

Track 7: Dynamics, Vibration, and Control

Tuesday, November 1, 9:15AM-10:00AM

Room: A226

Greater Columbus Convention Center

Title: Flexoelectricity and Electrets

Pradeep Sharma
University of Houston

7-2: Nonlinear Dynamics, Control, and Stochastic Mechanics

07-02-01: Nonlinear Dynamics, Control, and Stochastic Mechanics

10:15AM–12:00PM - CONVENTION CENTER, A223

10:15AM

Nonlinear Dynamics Simulation of Stress Concentration Factor of Pear Cam and Roller Follower Mechanism With Clearance

Technical Paper Publication: IMECE2022-94728

Louay S. Yousuf - San Diego State University

10:36AM

Effect of Different Material Properties for Globoidal Cam and Roller Follower System With Clearance on the Nonlinear Dynamics Phenomenon

Technical Paper Publication: IMECE2022-94732

Louay S. Yousuf - San Diego State University

10:57AM

Nonlinear Dynamics of a Planar Mechanism With Cam and Clearance

Technical Paper Publication: IMECE2022-94873

Louay S. Yousuf - San Diego State University
Dan Marghitu - Auburn University

11:18AM

Electrostatically Actuated MEMS Cantilevers of Linear Thickness Variation: Amplitude-Frequency Response of Parametric Resonance

Technical Paper Publication: IMECE2022-95111

Dumitru Caruntu - The University of Texas Rio Grande Valley

Rigoberto Flores - The University of Texas Rio Grande Valley

11:39AM

Effect of Number of Contact Points on the Fretting Wear Estimation of a Frictionally Damped Blade Platform

Technical Paper Publication: IMECE2022-95653

Aykut Cardak - Middle East Technical University

Ender Cigeroglu - Middle East Technical University

7-3: Design and Control of Robots, Mechanisms, and Structures

07-03-01: Design and Control of Robots, Mechanisms, and Structures

10:15AM–12:00PM - CONVENTION CENTER, A224

10:15AM

Darrieus Wind Turbines With Twisted Blades

Technical Paper Publication: IMECE2022-94124

Yashkumar Sutariya - Texas A&M University–Kingsville
Hong Zhou - Texas A&M University–Kingsville

10:36AM

Solar Tracking Using Four-Bar Mechanisms

Technical Paper Publication: IMECE2022-94131

Saul Munoz - Texas A&M University–Kingsville
Hong Zhou - Texas A&M University–Kingsville



TECHNICAL SESSIONS

TUESDAY, NOVEMBER 1

10:57AM**Design of Low-Level Hardware for a Multi-Layered Control Architecture****Technical Paper Publication: IMECE2022-94614***Madeline Kogelis - Virginia Polytechnic Institute and State University**Zachary Fuge - Virginia Polytechnic Institute and State University**Connor Herron - Virginia Polytechnic Institute and State University**Bhaben Kalita - Virginia Polytechnic Institute and State University**Alexander Leonessa - Virginia Polytechnic Institute and State University***11:18 AM****Mechanical Design Upgrade of Kinematically-Reconfigurable Humanoid****Technical Paper Publication: IMECE2022-94631***Kiwon Sohn - University of Hartford**Jordaine Wisdom - University of Hartford**Ethan Sharpe - University of Hartford**James Robinson - University of Hartford**Akin Tatoglu - University of Hartford***11:39AM****Design and Development of a Fish-Like, Soft Biomimetic Robot****Technical Paper Publication: IMECE2022-94635***Nikhil Pai - Kennesaw State University**Andrea Contreras Esquen - Kennesaw State University**Coskun Tekes - Kennesaw State University**Amir Ali Amiri Moghadam - Kennesaw State University**Ayse Tekes - Kennesaw State University***7-1: General Dynamics, Vibration, and Control****07-01-01: General Dynamics, Vibration, and Control Count****1:30PM–3:15PM - CONVENTION CENTER, A223****1:30PM****Engine Mounting Systems for Electric Powertrains: Mounting Layouts and Design Parameters****Technical Paper Publication: IMECE2022-87646***Sudhir Kaul - Western Carolina University***1:51PM****Low-Cost Portable High-Speed Data Logging****Technical Paper Publication: IMECE2022-94016***Colton Kerr - United States Military Academy**John Rogers - United States Military Academy***2:12PM****Analysis of Inequality Constraints Without Using Lagrange Multipliers With Applications to Classical Dynamical Systems****Technical Paper Publication: IMECE2022-94362***Brennan McCann - Embry-Riddle**Aeronautical University**Morad Nazari - Embry-Riddle Aeronautical University**Firdaus Udwadia - University of Southern California***2:33PM****Natural Frequency and Mode Shape of Shaft With Elastically Mounted Rotary Inertia From Governing Equations With Dirac Delta Function****Technical Paper Publication: IMECE2022-94759***Pezhman Hassanpour - Gannon University***IMECE**[®]**ONE GREAT LEARNING EXPERIENCE.**
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TECHNICAL SESSIONS

TUESDAY, NOVEMBER 1

2:54PM

Model of Angular Object Positioning Process by a System of Oblique Friction Force Fields on Parallel Planes

Technical Paper Publication: IMECE2022-94948
Tomasz Piatkowski - Bydgoszcz University of Science and Technology

7-3: Design and Control of Robots, Mechanisms, and Structures

07-03-02: Design and Control of Robots, Mechanisms, and Structures

1:30PM–3:15PM - CONVENTION CENTER, A224

1:30PM

Performance Evaluation of a Helicopter Main Rotor Hydraulic Control System Using Rotor Equivalent Dynamic Parameters

Technical Paper Publication: IMECE2022-94779
Hasan Ali Düzagaç - Middle East Technical University
Hakan Caliskan - Middle East Technical University
Raif Tuna Balkan - Middle East Technical University

1:51PM

In-House Built Robust and Adaptable System Architecture for Virtual Reality Haptic Interface

Technical Paper Publication: IMECE2022-95054
An-Chi He - Virginia Polytechnic Institute and State University
Connor Herron - Virginia Polytechnic Institute and State University
Bhaben Kalita - Virginia Polytechnic Institute and State University
Alexander Leonessa - Virginia Polytechnic Institute and State University

2:12PM

Robust Dynamic Modeling and Trajectory Tracking Controller of a Universal Omni-Wheeled Mobile Robot

Technical Paper Publication: IMECE2022-95079
Nalaka Amarasiri - University of Louisiana at Lafayette
Alan Barhorst - University of Louisiana at Lafayette
Raju Gottumukkala - University of Louisiana at Lafayette

2:33PM

Development of a Compliant Gripper Driven by Three DoF Soft Robot

Technical Paper Publication: IMECE2022-95204
Ricardo Ramirez - Kennesaw State University
Pt Angel Tran - Kennesaw State University
Derek Price - Kennesaw State University
Amir Ali Amiri Moghadam - Kennesaw State University
Ayse Tekes - Kennesaw State University

2:54PM

An Inflatable Soft Crawling Robot With Nondestructive Testing Capability for Overhead Power Line Inspection

Technical Paper Publication: IMECE2022-95228
Nicolás Mendoza - New Mexico State University
Hamidreza Nemati - New Mexico State University
Mahdi Haghshenas-Jaryani - New Mexico State University
Ehsan Dehghan-Niri - New Mexico State University

7-4: Fluid-Structure Interaction

07-04-01: Fluid Structure Interaction I

3:30PM–5:15PM - CONVENTION CENTER, A222

3:30PM

Evaluation of Fuel Rod Response Using Principal Component Analysis



TECHNICAL SESSIONS

TUESDAY, NOVEMBER 1

Technical Paper Publication: IMECE2022-96808

Ibrahim Gad-el-Hak - Polytechnique Montréal
Njuki Mureithi - Polytechnique Montréal
Kostas Karazis - Framatome Inc.

3:51PM

Dynamics of a Cantilevered Pipe Aspirating Fluid and Subjected to Reverse External Flow: The Effect of External Flow Confinement

Technical Paper Publication: IMECE2022-94575

Ahmed Shaaban - McGill University
Mahdi Chehrehghani - McGill University
Arun K. Misra - McGill University
Michael P. Paidoussis - McGill University

4:12PM

Effects of Corner Radii on Vortex-Induced Vibration With Forced Convection Heat Transfer From Tandem-Cylinder at Low Re

Technical Paper Publication: IMECE2022-94978

Yuvraj Sarout - Khalifa University of Science and Technology
Md. Islam - Khalifa University of Science & Technology
Isam Janajreh - Khalifa University of Science and Technology

4:33PM

Dynamics of a Confined Cantilevered Pipe Aspirating Fluid Under Simultaneous Internal and External Axial Flows: A Computational Coupled Two-Way Fluid-Structure Interaction Analysis

Technical Presentation: IMECE2022-97408

Farhang Daneshmand - King's College
Tahereh Liaghat - McGill University
Michael Paidoussis - McGill University

4:54PM

Influence of Surface Roughness on Heat Transfer and Flow-Induced Vibrations of a Circular Cylinder

Technical Paper Publication: IMECE2022-94962

Ussama Ali - Khalifa University of Science and Technology
Md. Islam - Khalifa University of Science and Technology
Isam Janajreh - Khalifa University of Science and Technology

7-1: General Dynamics, Vibration, and Control**07-01-02: General Dynamics, Vibration, and Control Count****3:30PM–5:15PM - CONVENTION CENTER, A223****3:30PM**

Application of Second-Order Boundary Conditions in the Vibrations of Beams With Attached Lumped Mass Under Axial Force

Technical Paper Publication: IMECE2022-94761

Pezhman Hassanpour - Gannon University

3:51PM

Control of Flight Vehicles From the Perspective of Non-Holonomic Constraint Manifold Dynamics: Quadrotor Application

Technical Paper Publication: IMECE2022-95040

Ambika Dahal - University of Louisiana at Lafayette
Alan Barhorst - University of Louisiana at Lafayette

4:12PM

Semi-Active Structural Vibration Mitigation Using a U-Tank

Technical Paper Publication: IMECE2022-95043

Thongchai Phairoh - Virginia State University

4:33PM

Estimation of the Response, Power Spectra, and Whirling Patterns Generated From Mud Circulating Along the Annulus During Drilling Procedures: An Alternative Mathematical Representation via Finite Element Modelling



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TECHNICAL SESSIONS

TUESDAY, NOVEMBER 1

Technical Paper Publication: IMECE2022-95577*Eleazar Marquez - The University of Texas Rio Grande Valley***4:54PM****New Compound Fractional Sliding Mode Control and Super-Twisting Control of a MEMS Gyroscope****Technical Paper Publication: IMECE2022-95743***Mehran Rahmani - Arizona State University
Sangram Redkar - Arizona State University***7-3: Design and Control of Robots, Mechanisms and Structures****07-03-03: Design and Control of Robots, Mechanisms and Structures****3:30PM–5:15PM - CONVENTION CENTER, A224****3:30PM****Development of a Novel Three-Universal-Spherical-Revolute Soft Parallel Robot****Technical Paper Publication: IMECE2022-95235***Cecil Abidoeye - Kennesaw State University
Devin Grace - Kennesaw State University
Andrea Contreras-Esquen - Kennesaw State University
Aden Edwards - Kennesaw State University
Turaj Ashuri - Kennesaw State University
Ayse Tekes - Kennesaw State University
Amir Ali Amiri Moghadam - Kennesaw State University***3:51PM****A Novel Platform Orientation System for PID-Controlled Ball-Catching Robot****Technical Paper Publication: IMECE2022-95249***Tariq Arif - Weber State University
Stockton Mckay - Weber State University
Benjamin Conklin - Weber State University***4:12PM****Lightweight, Compliant-Based Robot Gripper With a Single Shape Memory Alloy Actuator****Technical Paper Publication: IMECE2022-95374***Ahmad M. Alshorman - Jordan University of Science and Technology
Omar A. Ababneh - Jordan University of Science and Technology
Anas I. Abushaker - Jordan University of Science and Technology
Omar Radwan - Jordan University of Science and Technology***4:33PM****Flexible Low-Level Control Software Framework for Achieving Critical Real-Time Deadlines****Technical Paper Publication: IMECE2022-95438***Nicholas Tremaroli - Virginia Polytechnic Institute and State University
Maxwell Stelmack - Virginia Polytechnic Institute and State University
Connor Herron - Virginia Polytechnic Institute and State University
Bhaben Kalita - Virginia Polytechnic Institute and State University
Alexander Leonessa - Virginia Polytechnic Institute and State University***4:54PM****Design of a Kangaroo-Inspired Running Robot****Technical Paper Publication: IMECE2022-95793***Garrick Beaster - Lawrence Technological University
Badih Jawad - Lawrence Technological University
Vernon Fernandez - Lawrence Technological University
Hamid Vejdani - Lawrence Technological University*

TECHNICAL SESSIONS

WEDNESDAY, NOVEMBER 2

WEDNESDAY, NOVEMBER 2

Track 7: Dynamics, Vibration, and Control

Wednesday, November 2, 9:45AM - 10:30AM

Room: A210/A211

Greater Columbus Convention Center

Title: Fluid Structural Thermal Dynamic Interaction in Hypersonic Flow*Earl Dowell**Duke University***7-22: Industrial Applications in Dynamics, Vibrations and Control****07-22-01: Industrial Applications in Dynamics, Vibrations and Control****10:45AM–12:30PM - CONVENTION CENTER, A220****10:45AM****Stability Improvement of High-Speed Train Bogie With Reduced Order Model Based Control****Technical Presentation: IMECE2022-96605***Anni Zhao - University of California, Merced**Jianqiao Sun - University of California, Merced***11:06AM****Finite Element-Based Prediction and Experimental Validation of Drilling Tool Lateral Motion Dynamics****Technical Paper Publication: IMECE2022-96130***Fei Song - Schlumberger**Ke Li - Schlumberger**Liangyu Xu - Schlumberger***11:27AM****Comparing Instrumentation Selection Techniques for Vibration Testing****Technical Paper Publication: IMECE2022-95018***Moheimin Khan - Sandia National Laboratories**Justin Wilbanks - Sandia National Laboratories**Chandler Smith - Sandia National Laboratories**Timothy Walsh - Sandia National Laboratories**Brian Owens - Sandia National Laboratories***11:48AM****An ANOVA Based Study of Variations in Circularity Form Error Due to Mathematical Methods and Measuring Instrument Eccentricity****Technical Paper Publication: IMECE2022-95046***Chittaranjan Sahay - University of Hartford**Suhash Ghosh - University of Hartford**Nithish Adhithya Venkatesh - University of Hartford**Keshav Radhakrishnan - University of Hartford***12:09PM****Long Short-Term Memory Neural Networks for Predicting Dynamic Response of Complex Structures****Technical Paper Publication: IMECE2022-97025***Yabin Liao - Embry–Riddle Aeronautical University, Prescott**Biswas Poudel - Embry–Riddle Aeronautical University, Prescott**Priyanshu Kumar - Embry–Riddle Aeronautical University, Prescott**Mark Sensemier - Embry–Riddle Aeronautical University, Prescott***7-3: Design and Control of Robots, Mechanisms, and Structures****07-03-04: Design and Control of Robots, Mechanisms, and Structures****10:45AM–12:30PM - CONVENTION CENTER, A221****IMECE**[®]**ONE GREAT LEARNING EXPERIENCE.**
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TECHNICAL SESSIONS

WEDNESDAY, NOVEMBER 2

10:45AM**A Mapping Approach to Achieve Torque Control for Parallel-Actuated Robotic Systems****Technical Paper Publication: IMECE2022-95893***Stephen Welch - Virginia Polytechnic Institute and State University**Christian Runyon - Virginia Polytechnic Institute and State University**Benjamin Beiter - Virginia Polytechnic Institute and State University**Connor Herron - Virginia Polytechnic Institute and State University**Bhaben Kalita - Virginia Polytechnic Institute and State University**Alexander Leonessa - Virginia Polytechnic Institute and State University***11:06AM****Development of a Soft Robotic Gripper for Carpet Handling****Technical Paper Publication: IMECE2022-95931***Ayman Abbas - The British University in Egypt**Anwar Sahbel - The British University in Egypt***11:27AM****Mechatronic System Design and Construction of a CNC Machine for Cutting Styrofoam Parts for RC Planes****Technical Paper Publication: IMECE2022-95972***Sebastian Roa Prada - Universidad Autónoma de Bucaramanga***11:48AM****Development of a Bio-Inspired Hopping Leg for Lunar Exploration Rover****Technical Paper Publication: IMECE2022-95975***Mary Nguyen - University of Cincinnati**Elizabeth Salai - University of Cincinnati**Andrew Smith - University of Cincinnati**Andrew Barth - University of Cincinnati**Janet Dong - University of Cincinnati**Ou Ma - University of Cincinnati***12:09PM****Multi-Tiered Safety for Dynamic Autonomous Warehouse Robots****Technical Paper Publication: IMECE2022-95985***Ethan Rabb - U.S. Military Academy**Isaac Hagberg - U.S. Military Academy**Alex Murphy - U.S. Military Academy**Steven Butts - U.S. Military Academy**Skander Guizani - U.S. Military Academy**Rogers John - U.S. Military Academy**Joseph L. Heyman - U.S. Military Academy**Steven Crews - U.S. Military Academy***7-1: General Dynamics, Vibration, and Control****07-01-03: General Dynamics, Vibration, and Control Count / Nonlinear Dynamics, Control, and Stochastic Mechanics****2:00PM–3:45PM - CONVENTION CENTER, A220****2:00PM****Further Insights Into the Timoshenko-Ehrenfest Beam Theory****Technical Paper Publication: IMECE2022-96554***Jnan Ranjan Banerjee - City, University of London**David Kennedy - Cardiff University**Isaac Elishakoff - Florida Atlantic University***IMECE**[®]**ONE GREAT LEARNING EXPERIENCE.**
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TECHNICAL SESSIONS

WEDNESDAY, NOVEMBER 2

2:21PM

Seismic Vibration Attenuation in a Shear Building Structure Using a Nonlinear Energy Sink With Asymmetric Bi-Linear Element

Technical Paper Publication: IMECE2022-96839

Eliot Motato - University of Indianapolis

2:42PM

On the Stability Analysis of a Double-Link Inverted Pendulum Subject to an Oscillatory Tilted Excitation

Technical Paper Publication: IMECE2022-94636

Babak Taherian - California State University, Long Beach

Praveen Shankar – California State University, Long Beach

3:03PM

Analytical Study of a Piezoelectric Energy Harvester Under Both Steady Flow and Harmonic Excitation

Technical Paper Publication: IMECE2022-94647

Bo Yu - University of Wisconsin-Platteville

Bryan Boettcher - University of Wisconsin-Platteville

3:24PM

Experimental Characterization of the Nonlinear Boundary Conditions Applied by Two Different Designs of Spacer Grids on PWR Fuel Rods

Technical Paper Publication: IMECE2022-96787

Giovanni Ferrari - McGill University

Brian Painter - Framatome

Giulio Franchini - McGill University

Kostas Karazis - Framatome

Marco Amabili - McGill University

7-3: Design and Control of Robots, Mechanisms and Structures

07-03-05: Design and Control of Robots, Mechanisms and Structures

2:00PM–3:45PM CONVENTION CENTER, A221

2:00PM

Development of Kinematic and Dynamic Model of an Omnidirectional Four Mecanum Wheeled Robot

Technical Paper Publication: IMECE2022-96143

Noah Brown - Wentworth Institute of Technology

Trey Pierce - Wentworth Institute of Technology

Gloria Ma - Wentworth Institute of Technology

James Mccusker - Wentworth Institute of Technology

Filip Cuckov - Wentworth Institute of Technology

2:21PM

Development of a Haptic Glove for the Index and Middle Fingers of the Right Hand With Force Feedback

Technical Paper Publication: IMECE2022-96206

Jhon A. Caballero Moreno - Universidad Autónoma de Bucaramanga

Sebastian Roa Prada - Universidad Autónoma de Bucaramanga

2:42PM

Vibration Control of a Cantilever Beam Using Reduced Model

Technical Paper Publication: IMECE2022-96406

Amir Mohamad Kamalirad - University of Saskatchewan

Reza Fotouhi - University of Saskatchewan

Mitra Taghizadeh - University of Saskatchewan



TECHNICAL SESSIONS

WEDNESDAY, NOVEMBER 2

3:03PM**Quadcopter Control Using Single Network Adaptive Critics****Technical Paper Publication: IMECE2022-96834***Alberto Velazquez - University of Texas Rio Grande Valley**Lei Xu - Kent State University**Tohid Sardarmehni - California State University, Northridge***3:24PM****Using Actor Critic Reinforcement Learning for Control and Flight Formation of Quadrotors****Technical Paper Publication: IMECE2022-97224***Edgar Torres - University of Texas Rio Grande Valley**Lei Xu - Kent State University**Tohid Sardarmehni - California State University, Northridge***7-3: Design and Control of Robots, Mechanisms and Structures****07-03-06: Design and Control of Robots, Mechanisms and Structures****4:00PM–5:45PM - CONVENTION CENTER, C160A****4:00PM****A Comparative Study of Feasible Trajectories for an Under-Actuated Two-Link Bipedal Walking Robot With Hybrid Zero Dynamics Based Motion Planning****Technical Paper Publication: IMECE2022-95603***Shri Ishwaryaa S V - Indian Institute of Technology Bombay**Akshay Kumar - Indian Institute of Technology Bombay**Vivek Sangwan - Indian Institute of Technology Bombay***4:21PM****Actively Controlled Magnetic Bearing System Using Compliant Mechanism****Technical Paper Publication: IMECE2022-96233***Vivek Chaudhary - Indian Institute of Technology Delhi**Sameer Pandey - Indian Institute of Technology Delhi**Jitendra P Khatait - Indian Institute of Technology Delhi**Sudipto Mukherjee - Indian Institute of Technology Delhi***4:42PM****Using Actor-Critic Reinforcement Learning for Control and Flight Formation of Quadrotors****Technical Paper Publication: IMECE2022-97224***Edgar Torres - UTRGV**Lei Xu - Kent State University**Tohid Sardarmehni - California State University, Northridge***5:03PM****Multi-Tiered Safety for Dynamic Autonomous Warehouse Robots****Technical Paper Publication: IMECE2022-95985***Ethan Rabb - USMA**Isaac Hagberg - USMA**Alex Murphy - USMA**Steven Butts - USMA**Skander Guizani - USMA**Rogers John - USMA**Joseph L. Heyman - USMA**Steven Crews - USMA***5:24PM****A Comprehensive Assessment of Gearbox Tooth Faults Based on Dynamic Modelling and Machine Learning****Technical Paper Publication: IMECE2022-95672***Vikash Kumar - Indian Institute of Technology Patna**Subrata Mukherjee - Indian Institute of Technology Patna**Sanjeev Kumar - Indian Institute of Technology Patna**Somnath Sarangi - Indian Institute of Technology Patna***IMECE**[®]**ONE GREAT LEARNING EXPERIENCE.**
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TECHNICAL SESSIONS

WEDNESDAY, NOVEMBER 2

7-4: Fluid-Structure Interaction**07-04-02: Fluid Structure Interaction / Marine Electromechanical Systems and Ocean Mechatronics****4:00PM–5:45PM - CONVENTION CENTER, A220****4:00PM**

Vortex Spoilers Do Not Work to Suppress Pulsations Generated by Turning Flows Into a Side Branch Against a Deadleg

Technical Paper Publication: IMECE2022-93616

Kamal Botros - Nova Husky Research Corp.
Eric Clavelle - NOVA Chemicals
Nic Chan - NOVA Chemicals
Hemanth Satish - TC Energy

4:21PM

Effects of Flow-Induced Vibration on Forced Convection Heat Transfer From Three Tandem Cylinders of Different Spacing Ratios

Technical Paper Publication: IMECE2022-95139

Hamid Khan - Khalifa University of Science and Technology
Md. Islam - Khalifa University of Science and Technology

4:42PM

Effect of Whirling Motion on the Fluid Induced Instability Force in Axial Compressor Rotors

Technical Paper Publication: IMECE2022-96957

Xia Sheng - University of Cincinnati
Tandalam Shashikant Indraneel - University of Cincinnati
Jay Kim - University of Cincinnati

5:03PM

Performance Characteristics of PMDC Motor of Small-Scale Experimental Ocean Current Turbine

Technical Paper Publication: IMECE2022-95774

Shahab Rouhi - The University of New Orleans
Nikolaos Xiros - The University of New Orleans
Erdem Aktosun - The University of New Orleans
James Vanzwieten - Florida Atlantic University
Cornel Sultan - Virginia Tech
Juliette Ioup - The University of New Orleans
Setare Sadeqi - The University of New Orleans

5:24PM

Applying Artificial Intelligence to Optimize Small-Scale Ocean Current Turbine Performance

Technical Paper Publication: IMECE2022-95804

Shahab Rouhi - The University of New Orleans
Setare Sadeqi - The University of New Orleans
Nikolaos Xiros - The University of New Orleans
Lothar Birk - The University of New Orleans
Erdem Aktosun - The University of New Orleans
Juliette Ioup - The University of New Orleans

7-6: Smart Structures and Structronic Systems: Sensing, Energy Generation, and Control**07-06-01: Smart Structures and Structronic Systems: Sensing, Energy Generation / Renewable Energy, Structural Health Monitoring, and Distributed****4:00PM**

Self-Powered Wireless Vibration Sensor for Structural Health Monitoring

Technical Paper Publication: IMECE2022-91050

Ghufran Aldawood - Louisiana Tech University
Hamzeh Bardaweel - Louisiana Tech University



TECHNICAL SESSIONS

THURSDAY, NOVEMBER 3

4:21PM

Metamaterials and the Change of the Path of Elastic Waves and Blast Waves

Technical Paper Publication: IMECE2022-95113
Sathyanara Hanagud - Georgia Institute of Technology

4:42PM

Energy Harvesting From the Tire Deformation

Technical Presentation: IMECE2022-95676
Kevin Nguyen - The University of Texas at Austin
Byoung Hee You - Texas State University
In-Hyounk Song - Texas State University
Meysam Khaleghian - Texas State University

5:03PM

Review on Advanced Piezoelectric Device Inventions

Technical Presentation: IMECE2022-98712
Tian-Bing Xu - Old Dominion University

5:24PM

A New Approach to Nonlinear Dynamic Modeling and Vibration Analysis of Tensegrity Structures

Technical Paper Publication: IMECE2022-94746
Sichen Yuan - Lawrence Technological University
Weidong Zhu - University of Maryland, Baltimore County

THURSDAY, NOVEMBER 3

7-10: Mobile Robots and Unmanned Ground Vehicles

07-10-01: Mobile Robots and Unmanned Ground Vehicles

10:15AM–12:00PM - CONVENTION CENTER, A210/A211

10:15AM

Development of Ai-Based Algorithms for the Estimation of Soil Organic Matter From the Integration of UAV and In-Ground Soil Sensor

Technical Presentation: IMECE2022-95276
Rishab Basutkar - Texas State University
Md. Jasim Uddin - Texas State University
Anahita Emami - Texas State University
Meysam Khaleghian - Texas State University

10:36AM

Fuzzy Logic Based Fusion of 2D Lidar and Depth Camera Data for Robust Perception of Obstacle Distance

Technical Paper Publication: IMECE2022-95281
Harsh Saksena - Indiana University–Purdue University Indianapolis
Sohel Anwar - Indiana University–Purdue University Indianapolis

10:57AM

Dynamic Modelling of a 4WD/4WS Ground Vehicle by Using Gibbs-Appell Approach

Technical Paper Publication: IMECE2022-95436
Pius Pius - North Dakota State University
Majura Selekwa - North Dakota State University

11:18AM

Autonomous Topographic Mapping of Unknown Environments by Dynamic Visual Data



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TECHNICAL SESSIONS

THURSDAY, NOVEMBER 3

Technical Paper Publication: IMECE2022-95497

Vomsheendhur Raju - North Dakota State University
Majura Selekwa - North Dakota State University

11:39AM**Aerial Vehicle Rapid 3D Multi Map Stitching Using Safe Landing Area****Technical Paper Publication: IMECE2022-95849**

Akin Tatoglu - University of Hartford
Cheng Chun Yin - University of Hartford
Brianna Cervello - University of Hartford
Antonio Corrado - University of Hartford
Bernie Balko - University of Hartford
Kiwon Sohn - University of Hartford

7-23: 100th Anniversary of the Timoshenko-Ehrenfest Beam Model**07-23-01: 100th Anniversary of the Timoshenko-Ehrenfest Beam Model****10:15AM–12:00PM - CONVENTION CENTER, A226****10:15AM****Did S.P. Timoshenko and P. Ehrenfest Overestimate the Importance of the Fourth-Order Time Derivative in Their Theory of Beams?****Technical Paper Publication: IMECE2022-95836**

Isaac Elishakoff - Florida Atlantic University

10:36AM**A Reformulated Transfer Matrix Method for the Dynamic Response of Multistep Euler-Bernoulli and Timoshenko Beams****Technical Paper Publication: IMECE2022-95959**

Daniel Segalman - Michigan State University
Firas Khasawneh - Michigan State University

10:57AM**Reduced Theories for Thick Shells****Technical Paper Publication: IMECE2022-96660**

Maria Anna De Rosa - University of Basilicata
Maria Lippiello - University of Naples "Federico II"
Isaac Elishakoff - Florida Atlantic University

11:18AM**Response and Constitutive Identification of Random Axial Functionally Gradient Timoshenko-Ehrenfest Beams****Technical Paper Publication: IMECE2022-96729**

Gabriele La Valle - Università degli Studi di Messina
Giovanni Falsone - Università degli Studi di Messina

11:39AM**Transverse Impact of Fibers by a High Velocity Projectile in Elastic and Elastic-Plastic Contact Regimes****Technical Presentation: IMECE2022-9708**

Sinan Muftu - Northeastern University
Runyang Zhang - Northeastern University

7-12: Optimization, Uncertainty and Probability**07-12-01: Optimization, Uncertainty and Probability / Modelling and Design Advances of Rotating Structures / Congress-Wide Symposium on NDE & SHM: Dynamics, Vibration, and Control for Structural Health Monitoring Applications****10:15AM–12:00PM - CONVENTION CENTER, A214/A215****10:15AM****Uncertain Control Co-Design Implementations Using Monte Carlo Simulation and Generalized Polynomial Chaos****Technical Paper Publication: IMECE2022-95229**

Saeed Azad - Colorado State University
Daniel Herber - Colorado State University

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TECHNICAL SESSIONS

THURSDAY, NOVEMBER 3

10:36AM**A New Approach to the Study and Prevention of the Clutch Judder****Technical Paper Publication: IMECE2022-92671***Manuel Tentarelli - University of Modena and Reggio Emilia**Stefano Cantelli - CNH Industrial Italia**Silvio Sorrentino - University of Modena and Reggio Emilia**Alessandro De Felice - University of Modena and Reggio Emilia***10:57AM****Stability Analysis of Parametrically Excited Isotropic Rotors on Anisotropic Supports****Technical Paper Publication: IMECE2022-92673***Alessandro De Felice - University of Modena and Reggio Emilia**Silvio Sorrentino - University of Modena and Reggio Emilia***11:18AM****Variable Kinematic Shell Finite Elements for Dynamic Analyses of Rotating Structures****Technical Paper Publication: IMECE2022-94418***Matteo Filippi - Politecnico di Torino**Rodolfo Azzara - Polytechnic of Turin**Erasmus Carrera - Polytechnic of Turin***11:39AM****Numerical Investigation of Water Effects on Surface Acoustic Wave Transmission****Technical Paper Publication: IMECE2022-96673***Luyu Bo - Mississippi State University**Jiali Li - Mississippi State University**Xinyu Zhang - Mississippi State University**Teng Li - Mississippi State University**Zhenhua Tian - Virginia Polytechnic Institute and State University***7-17: Machine Learning and Artificial Intelligence in Dynamics and Vibrations****07-17-01: Machine Learning and Artificial Intelligence in Dynamics, Vibrations and Control****10:15AM-12:00PM - CONVENTION CENTER, A212/A213****10:15AM****Experimental Investigation on the Use of Vibration Signals Combined With Robust Supervised Classification to Predict Radial Load Condition in Roller Element Bearings****Technical Paper Publication: IMECE2022-95632***Issam Abu-Mahfouz - Penn State Harrisburg**Amit Banerjee - Penn State Harrisburg**Esfakur Rahman - Penn State Harrisburg***10:36AM****Nonlinear Mapping Lyapunov Exponents-Based Knn Analysis for Fault Classification****Technical Paper Publication: IMECE2022-95739***Md. Saifuddin Ahmed Atique - University of North Dakota**Cai Xia Yang - University of North Dakota***10:57AM****Using Convolution Neural Networks (CNNs) to Learn by Sensor Signal Classification Critical Local Areas in a Physical Flexible Shaft Rotor System as an Example of Complicated Mechanical System****Technical Paper Publication: IMECE2022-96146***Panagiotis Papageorgiou - National Technical University of Athens**Ioannis T. Georgiou - National Technical University of Athens*

TECHNICAL SESSIONS

THURSDAY, NOVEMBER 3

11:18AM

Fault Detection in Multi-Layered Carbon Fiber Reinforced Cylindrical Shells by Advanced Proper Orthogonal Methods and Use of Experimental Vibration Data in Neural Network Training for Damage Diagnosis Machine Learning

Technical Paper Publication: IMECE2022-96255

Konstantinos N. Lontos - National Technical University of Athens

Ioannis T. Georgiou - National Technical University of Athens

11:39AM

Open-Loop Optimal Control for Tracking a Reference Signal With Approximate Dynamic Programming

Technical Paper Publication: IMECE2022-96769

Jorge Diaz - The University of Texas Rio Grande Valley
Lei Xu - Kent State University

Tohid Sardarmehni - California State University, Northridge

7-9: Vibrations of Continuous Systems

07-09-01: Vibrations of Continuous Systems

2:00PM–3:45PM - CONVENTION CENTER, A212/A213

2:00PM

Dynamics of Periodic Sandwich Beams

Technical Paper Publication: IMECE2022-94730

Eshagh Farzaneh Joubaneh - University of Vermont
Jihong Ma - University of Vermont

2:21PM

Gearbox Vibration Analysis of Using a Spectrogram and Power Spectrum Approach

Technical Paper Publication: IMECE2022-95218

Sufyan Mohammed - University of Mosul
Nouby Ghazaly - South Valley University
Jamil Abdo - Frostburg State University

2:42PM

Continuous Vibration in Planetary Gear Components: Experiments and Computer Simulation

Technical Presentation: IMECE2022-96113

Tristan Ericson - York College of Pennsylvania
Robert Paarker - The University of Utah

3:03PM

Experiments on Dynamic Non-Newtonian Fluid Interaction With Shells

Technical Paper Publication: IMECE2022-96320

Francesco Pellicano - University Modena and Reggio Emilia

Antonio Zippo - University of Modena and Reggio Emilia

Giovanni Iarriccio - University of Modena and Reggio Emilia

3:24PM

Modeling of a Two-Rigid-Body Landfish Using Nonholonomic Lagrange Equations

Technical Presentation: IMECE2022-99574

Jamal Ardister - Michigan State University
Brian Feeny - Michigan State University

7-10: Mobile Robots and Unmanned Ground Vehicles

07-10-02: Mobile Robots and Unmanned Ground Vehicles

2:00PM–3:45PM - CONVENTION CENTER, A210/A211

2:00PM

Cardynet: Deep Learning Based Navigation for Car-Like Robots in Dynamic Environments



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THURSDAY, NOVEMBER 3

Technical Paper Publication: IMECE2022-96023*Gurtajbir Herr - University of Maryland, College Park**Lasitha Weerakoon - University of Maryland, College Park**Miao Yu - University of Maryland, College Park**Nikhil Chopra - University of Maryland, College Park***2:21PM****Design of a Low-Cost Autonomous Mobile Robot for Outdoor Applications****Technical Paper Publication: IMECE2022-96093***Cameron Morris - Western New England University**Vedang Chauhan - Western New England University***2:42PM****Four-Wheel Independent Steering “Swerve Drive”****Technical Paper Publication: IMECE2022-96192***Benjamin Denoma - University of Cincinnati**Micheal Kendall - University of Cincinnati**Nicholas Poulos - University of Cincinnati**Janet Dong - University of Cincinnati**Ray Frank - Butler Tech***3:03PM****An Economical Approach Towards Bathymetric Mapping of Shallow Water Basins Using Unmanned Surface Vessel****Technical Paper Publication: IMECE2022-97015***Devdas Shetty - University of the District of Columbia**Rakshith Kotian - National Institute of Technology Karnataka**Steevan Loyd Sequeira - National Institute of Technology Karnataka**Pavithra Nr - CSIR Fourth Paradigm Institute**Umesh Pruthviraj - National Institute of Technology Karnataka**Kv Gangadharan - National Institute of Technology Karnataka***3:24PM****Design and Control of a Tendon-Driven Robot to Scrub Spilt Food From Tile Surfaces****Technical Presentation: IMECE2022-99674***Noah Harmatz - Rutgers University**Christopher Gorka - Rutgers University**Aaron Mazzeo - Rutgers University***7-8: Multibody Dynamic Systems and Applications****07-08-01: Multibody Dynamic Systems and Applications****2:00PM–3:45PM - CONVENTION CENTER, A226****2:00PM****New Design for Implementation of 2-Degree-of-Freedom Planar Parallel Robot for Use in Creating an Infinite 3D Printer****Technical Paper Publication: IMECE2022-88317***Miguel De La Melena - Saint Martin's University**Shawn Duan - Saint Martin's University***2:21PM****Simulating a Piezoelectric-Haptic MemS Actuator in Low-Frequency Vibration****Technical Paper Publication: IMECE2022-88828***Alexander Benson - Saint Martin's University**Seth Carl - Saint Martin's University**Shawn Duan - Saint Martin's University***2:42PM****Matlab Toolbox for Design and Motion Analysis of Compliant Mechanisms and Soft Robots****IMECE**[®]**ONE GREAT LEARNING EXPERIENCE.**
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TECHNICAL SESSIONS

THURSDAY, NOVEMBER 3

Technical Paper Publication: IMECE2022-94205

Andrea Contreras-Esquen - Kennesaw State University
Juan Delgado - Kennesaw State University
Lance Soo - Kennesaw State University
Kevin Saldivar - Kennesaw State University
Lucas Schwenck - Kennesaw State University
Amir Ali Amiri Moghadam - Kennesaw State University
Ayse Tekes - Kennesaw State University

3:03PM**Multibody Representation of the Coupling Between Wave Generator and Flexspline in Strain Wave Gears****Technical Paper Publication: IMECE2022-94422**

Andrea Raviola - Politecnico di Torino
Antonio Carlo Bertolino - Politecnico di Torino
Andrea De Martin - Politecnico di Torino
Roberto Guida - Politecnico di Torino
Stefano Mauro - Politecnico di Torino
Massimo Sorli - Politecnico di Torino

3:24PM**On the Efficacy of Non-Holonomic Canonical Momentum Analysis of Constrained Multi-Body Mechanical Systems: Application in Ground Vehicle Double Wishbone Suspension Dynamics****Technical Paper Publication: IMECE2022-95181**

Oluwaseyi Olorunfemi - University of Louisiana at Lafayette
Alan Barhorst - University of Louisiana at Lafayette

7-7: Novel Control of Dynamic System and Design**07-07-01: Novel Control of Dynamic System and Design****4:00PM–5:45PM - CONVENTION CENTER, A210/A211****4:00PM****Mathematical Modelling of a Piezo-Actuated Cantilever Beam With Interferometer Feedback****Technical Paper Publication: IMECE2022-95819**

Jordan David Kochavi - California Polytechnic State University
Siyuan Xing - California Polytechnic State University

4:21PM**Coexisting Unstable Periodic Motions in the Rössler System****Technical Paper Publication: IMECE2022-95826**

Siyuan Xing - California Polytechnic State University
Albert Luo - Southern Illinois University Edwardsville
Edwardsville

4:42PM**Period-3 and Period-6 Motions in a Nonlinear Spring Pendulum****Technical Paper Publication: IMECE2022-96427**

Yu Guo - Midwestern State University Texas
Albert Luo - Southern Illinois University Edwardsville

5:03PM**Near-Optimal Control of Wheel Loaders Using Reinforcement Learning****Technical Paper Publication: IMECE2022-96681**

Tohid Sardarmehni - California State University at Northridge
Xingyong Song - Texas A&M University

5:24PM**A Neural Network-Augmented Bayesian Approach to Uncertain Parameter Estimation in Nonlinear Dynamic Systems****Technical Paper Publication: IMECE2022-95563**

Roja Zakeri - California State University Long Beach
Praveen Shankar - California State University Long Beach



TECHNICAL SESSIONS

THURSDAY, NOVEMBER 3

7-20: Congress-Wide Symposium on NDE & SHM: Dynamics, Vibration, and Control for Structural Health Monitoring Applications

07-20-01: Congress-Wide Symposium on NDE & SHM: Dynamics, Vibration, and Control for Structural Health Monitoring Applications

4:00PM–5:45PM - CONVENTION CENTER, A226

4:00PM

Design and Fabrication of a Test Rig for a New Approach on Health Monitoring of Roller Bearings Using Acoustic Emission

Technical Paper Publication: IMECE2022-95074

Heimir Bjarkason - University of Iceland

Saethor Asgeirsson - Icewind EHF

Runar Unnthorsson - University of Iceland

4:21PM

Gravity Impact on Post-Resonance Backward Whirl Excitation by the Nonsynchronous Whirl

Technical Paper Publication: IMECE2022-95344

Rafath Abdul Nasar - Khalifa University of Science and Technology

Mohammad A. Al-Shudeifat - Khalifa University of Science and Technology

4:42PM

Impact of Rotor-Stator Rub-Impact on Post-Resonance Backward Whirl Excitation

Technical Paper Publication: IMECE2022-95354

Rafath Abdul Nasar - Khalifa University of Science and Technology

Mohammad A. Al-Shudeifat - Khalifa University of Science and Technology

5:03PM

Multichannel Electromechanical Impedance Structural Diagnostics in Plate Specimens

Technical Paper Publication: IMECE2022-95937

Funmilola Nwokocha - New Mexico Institute of Mining and Technology

Andrei Zagrai - New Mexico Institute of Mining and Technology

David Hunter - New Mexico Institute of Mining and Technology

5:24PM

Generating Multi-Pixel Thermal Images Through an Acoustic-Thermal Effect

Technical Paper Publication: IMECE2022-96691

Teng Li - Mississippi State University

Jiali Li - Mississippi State University

Luyu Bo - Mississippi State University

Zhenhua Tian - Virginia Polytechnic Institute and State University

7-11: Control Theory and Applications

07-11-01: Control Theory and Applications / Dynamics and Control of Soft Structures

4:00PM–5:45PM - CONVENTION CENTER, A212/A213

4:00 PM

On the Observability of Quantum Dynamical Systems

Technical Paper Publication: IMECE2022-88856

Tristan Griffith - Texas A&M University

Vinod Gehlot - Jet Propulsion Laboratory

Mark Balas - Texas A&M University



TECHNICAL SESSIONS

THURSDAY, NOVEMBER 3

4:21PM

Sliding Mode Control of a Quad-Copter for Autonomous Trajectory Tracking

Technical Paper Publication: IMECE2022-95466

Daniel Wood - North Dakota State University

Majura Selekwa - North Dakota State University

4:42PM

Dependent Variable Infinite Model Predictive Controller for Nonlinear MIMO Systems

Technical Paper Publication: IMECE2022-97067

Ma'moun Abu-Ayyad - Penn State Harrisburg

Ahm Rahman - Penn State Harrisburg

Anilchandra Attaluri - Penn State Harrisburg

5:03PM

Characterizing Swimming Locomotions of an Asymmetrical Soft Millirobot in a Rotating Magnetic Field

Technical Paper Publication: IMECE2022-95285

Jake Bagley - Kennesaw State University

Graham Quasebarth - Kennesaw State University

Dal Hyung Kim - Kennesaw State University

5:24PM

Joint Control With Passive Damping for a Planar Two-Link Tendon-Driven Flexible Manipulator

Technical Paper Publication: IMECE2022-95636

Emeka Ezeanya - University of Louisiana at Lafayette

Alan Barhorst - University of Louisiana at Lafayette

Track 8: Energy

Sponsored by the Advanced Energy Systems Division Topics:

Topics:

- 8-1: Electrochemical Energy Storage and Conversion System
- 8-2: Advanced Modeling of Electrochemical Materials
- 8-3: Energy-Related Multidisciplinary
- 8-4: Fundamentals and Applications of Thermodynamics
- 8-5: 4E Analysis and Optimization of Energy Systems
- 8-6: Design and Analysis of Energy Conversion Systems
- 8-7: Energy Systems Components
- 8-8: Design and Analysis of Energy Recovery Systems
- 8-9: Thermal Energy Storage
- 8-10: Nuclear Energy: Plants, Design, Analysis and Safety
- 8-11: CMS-General Combustion and Fire
- 8-12: CMS-Novel Combustion Technologies
- 8-13: Outstanding Early-Career Investigators in Energy Conversion and Storage Systems
- 8-14: Solar Energy
- 8-15: Wind and Water power
- 8-16: Emerging Renewable Energy Technologies
- 8-17: Sustainable and Grid-Interactive Buildings

ACKNOWLEDGMENT**TRACK ORGANIZERS**

Track Organizer: Soumik Banerjee

Track Co-Organizer: Adriano Sciacovelli

Track Co-Organizer: Guangdong Zhu

Track Co-Organizer: Jun Xu



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TECHNICAL SESSIONS

TOPIC ORGANIZERS

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 Aggrey Mwesigye, University of Calgary
 Andrea Lazzaretto, University of Padova
 Binghe Liu, Chongqing University
 Gianluca Carraro, University of Padua
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 Lubing Wang, Ningbo University
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 Andrea Lazzaretto
 Binghe Liu- Chongqing University
 Elham Sahraei - Temple University
 Guangdong Zhu - National Renewable Energy Laboratory
 Hakan Ozaltun - Idaho National Laboratory
 Heejin Cho - Mississippi State University
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 Jovica Riznic - Canadian Nuclear Safety Commission
 Jun Xu - The University of North Carolina at Charlotte
 Lubing Wang - Ningbo University Soumik Banerjee - Washington State University
 Nathan Tom - National Renewable Energy Laboratory
 Pei Dong - George Mason University
 Roberto Capata- Sapienza Universita di Roma
 Roberto Carapellucci - University of L'Aquila
 Sapienza Universita di Roma
 Soumik Banerjee - Washington State University
 Tariq Shamim - Northern Illinois University
 Tugce Baser - University of Illinois
 Xiang Gao- University of North Carolina at Charlotte



TECHNICAL SESSIONS

MONDAY, OCTOBER 31

TRACK 8

MONDAY, OCTOBER 31

Track 8: Energy

Monday, October 31, 9:45AM-10:30AM

Room: A226

Greater Columbus Convention Center

Title: SMART CSP - How artificial intelligence Can Support Concentrating Solar Technologies*Robert Pitz-Paal, DLR Institute of Solar Research
DLR Institute for Solar Research***8-1: Electrochemical Energy Storage and Conversion System****8-01-01: Electrochemical Energy Storage and Conversion System I****10:45AM–12:30PM - CONVENTION CENTER, A221****10:45AM****3D Thermal Fluid Solid Reactive Simulation to Predict Thermal Runaway in the Li-Ion Battery Packs and Innovative Designs for Better Thermal Management****Technical Paper Publication: IMECE2022-94912***Reghunath U - Tata Consultancy Services
Sastry Bonala - Tata Consultancy Services***11:06AM****Optimal Temperature Control on Thermal Management System for Improving PEMWE System Efficiency by a Transient Model****Technical Presentation: IMECE2022-95369***JaeHyeon Bae - Kongju National University
Sanghyun Yun - Chungnam National University
Minwoo Ahn - Youngsan University
Jaeyoung Han - Kongju National University***11:27AM****A Method to Account for the Effects of Electro-Osmotic Drag and Back Diffusion in PEM Fuel Cells****Technical Paper Publication: IMECE2022-96013***Nicholas Ingarra - Oakland University
Krzysztof (Chris) Kobus - Oakland University
Jonathan Maisonneuve - Oakland University***11:48AM****50 kw PEMFC Hybrid Energy Management System Driving Strategies****Technical Paper Publication: IMECE2022-96020***Younghyeon Kim - Chungnam National University
Sangseok Yu - Chungnam National University***12:09PM****Experimental and Numerical Investigation of the Electrochemical-Mechanical Coupling in Lithium-Ion Batteries****Technical Presentation: IMECE2022-99563***Chunhao Yuan - The University of North Carolina at Charlotte
Jun Xu - The University of North Carolina at Charlotte*

TECHNICAL SESSIONS

MONDAY, OCTOBER 31

8-2: Advanced Modeling of Electrochemical Materials**08-02-01: Advanced Modeling of Electrochemical Materials I**

10:45AM–12:30PM - CONVENTION CENTER, A223

10:45AM

A Computationally Efficient Approach for the Simulation of Silicon Anodes in Lithium-Ion Cells

Technical Paper Publication: IMECE2022-96150

Rebecca Webb - The Ohio State University
Xiaoling Chen - The Ohio State University
Sandip Mazumder - The Ohio State University
Marcello Canova - The Ohio State University

11:06AM

Multiphysics Understanding of Lithium Penetration Mechanism and Mitigation Strategy in Solid Electrolyte of All-Solid-State Batteries

Technical Presentation: IMECE2022-99543

Chunhao Yuan - The University of North Carolina at Charlotte
Jun Xu - The University of North Carolina at Charlotte

11:27AM

Theory Based Design of Sodium Thiophosphate Solid Ion Conductors

Technical Presentation: IMECE2022-99948

Aniruddha Dive - Washington State University
Soumik Banerjee - Washington State University

11:48AM

A 3D Electrochemical Model for the Si/C Composite Anode

Technical Presentation: IMECE2022-99724

Xiang Gao - The University of North Carolina at Charlotte
Jun Xu - The University of North Carolina at Charlotte

8-1: Electrochemical Energy Storage and Conversion System**08-01-02: Electrochemical Energy Storage and Conversion System II**

10:45AM–12:30PM - CONVENTION CENTER, A222

10:45AM

A Universal Anisotropic Model for a Lithium-Ion Cylindrical Cell Validated Under Axial, Lateral, and Bending Loads

Technical Presentation: IMECE2022-99583

Yihan Song - Temple University
Elham Sahraei - Temple University

11:06AM

Measurement of Adhesion and Damage of Electrodes in Lithium-Ion Batteries Using Nanoindentation and Scratch Tests

Technical Presentation: IMECE2022-95177

George Z. Voyiadjis - Louisiana State University
Edris Akbari - Louisiana State University

11:27AM

Electrochemical Impedance Spectroscopy as an Unconventional Tool for Differentiating Graphite, Graphene, and Graphene Oxide

Technical Presentation: IMECE2022-96544

Sonjoy Dey - Kansas State University
Gurpreet Singh - Kansas State University

11:48AM

Energetic and Exergetic Performance of a Compressed Thermal Energy Storage System Coupled With Deep Borehole Heat Exchanger

Technical Presentation: IMECE2022-99966

Aggrey Mwesigye - University of Calgary



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TECHNICAL SESSIONS

MONDAY, OCTOBER 31

8-14: Solar Energy**08-14-01: Photovoltaic****2:00PM–3:45PM - CONVENTION CENTER, A221****2:00PM**

Assessment of Cooling Technologies for Solar Photovoltaic Panels Accounting for Local Solar Irradiance and Ambient Temperature Conditions

Technical Paper Publication: IMECE2022-90239

Marcelo Lucas Aguilar - Pontificia Universidad Católica del Perú

César Celis - Pontificia Universidad Católica del Perú

2:21PM

Optical and Heat Transfer Performance of Conical Receivers for Desalination Application

Technical Paper Publication: IMECE2022-94804

Abhinay Soanker - Lehigh University

Alparslan Oztekin - Lehigh University

2:42PM

Efficient Solar Thermochemical Hydrogen Production in a Reactor Train System With Thermochemical Oxygen Removal

Technical Paper Publication: IMECE2022-94821

Aniket Patankar - Massachusetts Institute of Technology

Xiao-Yu Wu - University of Waterloo

Wonjae Choi - Ewha Womans University

Harry Tuller - Massachusetts Institute of Technology

Ahmed Ghoniem - Massachusetts Institute of Technology

3:03PM

Simulation and Parametric Studies of a Linear Fresnel Solar Concentrator Using Air as HTF for Agricultural Drying Applications

Technical Paper Publication: IMECE2022-95231

Daniela Jaramillo-Cobos - Escuela Superior Politécnica del Litoral

Emerita Delgado Plaza - Escuela Superior Politécnica del Litoral

Galo Durazno-Palacios - Escuela Superior Politécnica del Litoral

Juan Peralta-Jaramillo - Escuela Superior Politécnica del Litoral

3:24PM

Integration of Hybrid Porous Casting in Solar Receivers to Increase the Efficiency of Solar Systems

Technical Paper Publication: IMECE2022-95625

Sara Goren - Universidade do Minho

Flavia Barbosa - Universidade do Minho

Erany Constantino - Universidade do Minho

Helder Puga - Universidade do Minho

Jose Teixeira - Universidade do Minho

8-14: Solar Energy**08-14-02: Solar Thermal****2:00PM–3:45PM - CONVENTION CENTER, A222****2:00PM**

Heat Flux Analysis of a Solar Thermal Collector Incorporated with Optimized Involute Reflectors

Technical Paper Publication: IMECE2022-95829

Celine S.L. Lim - University of Missouri-Kansas City

Sarvenaz Sobhansarbandi - University of Missouri-Kansas City



TECHNICAL SESSIONS

MONDAY, OCTOBER 31

2:21PM**Design and Operational Analysis of a Photovoltaic Irrigation System****Technical Paper Publication: IMECE2022-95967***Juseny Moura - Universidade do Minho**Ana Cristina Ferreira - Universidade do Minho**Carlos Fernandes Costa - Rosseti Engenharia**Luis Barreiros Martins - Universidade do Minho***2:42PM****Performance Evaluation of a Solar Thermal Collector Under Various Design Conditions: An Experimental Study****Technical Paper Publication: IMECE2022-96304***Arman Nokhosteen - University of Missouri-Kansas City**Onur Ozkaya - University of Missouri-Kansas City**Sarvenaz Sobhansarbandi - University of Missouri-Kansas City***3:03PM****Thermal Analysis of a Fiber Optic Cable for Hybrid Solar Lighting in Vertical Farming Application****Technical Paper Publication: IMECE2022-96606***Sevki Cesmeci - Georgia Southern University**Mohammad Towhidul Islam - Georgia Southern University**Stephen Horowitz - Fen Technology***3:24PM****Techno-Economic Analysis of Different Condenser Cooling Options for Solar Vapor Absorption Cooling Machines in Arid Conditions****Technical Presentation: IMECE2022-98055***Zakariya Kaneesamkandi - King Saud University**Abdul Sayeed - King Saud University**Waleed Mohammed Alfadda - King Saud University***8-14: Solar Energy****08-14-03: Emerging Technologies in Solar Energy****2:00PM–3:45PM - CONVENTION CENTER, A223****2:00PM****The Influence of Seasonal Cloud Cover, Ambient Temperature, and Seasonal Variations in Daylight Hours on the Optimal PV Panel Tilt Angle in the United States****Technical Presentation: IMECE2022-99860***Essa Al-Hamer - University of Dayton**Addison Grigsby - University of Dayton**Rydge Mulford - University of Dayton***2:21PM****Call for Partnership: A Newly Formed Heliostat Consortium (Heliocon) to Advance Heliostat Technologies for Concentrating Solar Power****Technical Presentation: IMECE2022-100268***Guangdong Zhu - National Renewable Energy Laboratory***2:42PM****A Systematic Literature Review of Passive Energy Consumption Optimisation Strategies in Buildings and Their Selection Criteria****Technical Paper Publication: IMECE2022-93887***Amirhossein Balali - The University of Manchester**Akilu Yunusa-Kaltungo - University of Manchester**Rodger Edwards - The University of Manchester*

TECHNICAL SESSIONS

MONDAY, OCTOBER 31

3:03PM

Using Machine Learning Methods Towards Identifying College Campus Load Profiles and Energy Storage Application for Reducing Peak Energy Demand From the Utility Grid

Technical Paper Publication: IMECE2022-94830

Christopher Sweeny - Wentworth Institute of Technology

Jackson R. Smith - Wentworth Institute of Technology

Afsaneh Ghanavati - Wentworth Institute of Technology

James R. McCusker - Wentworth Institute of Technology

3:24PM

Feasibility Study and Design of a Seawater Air-Conditioning System for a University Building in Fiji

Technical Paper Publication: IMECE2022-96152

Muzammil Ali - The University of the South Pacific

Reemal Prasad - The University of the South Pacific

Mohammed Rafiuddin Ahmed - The University of the South Pacific

8-6: Design and Analysis of Energy Conversion Systems

08-06-01: Design and Analysis of Energy Conversion Systems I

4:00PM–5:45PM - CONVENTION CENTER, A221

4:00PM

Application of Artificial Neural Network to Predict the Performance of Thermoelectric Power Plants at Design Conditions

Invited Presentation: IMECE2022-94615

Roberto Carapellucci - University of L'Aquila

Lorena Giordano - ENEA, Italian National Agency for New Technologies, Energy and Sustainable Economic Development

4:42PM

Optimization of Supercritical CO₂ Cycle Combined With Orc for Waste Heat Recovery

Technical Paper Publication: IMECE2022-95106

Roberto Carapellucci - University of L'Aquila

Davide Di Battista - University of L'Aquila

5:03PM

Exergy-Risk Hazard Analysis Applied to the Hydrogen Economy

Technical Presentation: IMECE2022-95559

Tatiana Morosuk - Technische Universität Berlin

Jimena Incer-Valverde - Technische Universität Berlin

Ivan Benedicto Constatijn - Technische Universität Berlin

George Tsatsaronis - Technische Universität Berlin

5:24PM

Optimal Design of Integrated Solar Combined Cycle and Desalination Systems

Technical Paper Publication: IMECE2022-95677

Ariana Pietrasanta - INGAR Instituto de Desarrollo y Diseño (CONICET-UTN)

Sergio Mussati - INGAR Instituto de Desarrollo y Diseño (CONICET-UTN)

Pio Aguirre - INGAR Instituto de Desarrollo y Diseño (CONICET-UTN)

Tatiana Morosuk - Technische Universität Berlin

Miguel Mussati - INGAR Instituto de Desarrollo y Diseño (CONICET-UTN)



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TECHNICAL SESSIONS

MONDAY, OCTOBER 31

8-6: Design and Analysis of Energy Conversion Systems**08-06-02: Design and Analysis of Energy Conversion Systems II****4:00PM–5:45PM - CONVENTION CENTER, A222****4:00PM****Design, Construction, and Thermodynamic Analysis of a Direct-Expansion Solar Assisted Heat Pump for Cold Climates****Technical Paper Publication: IMECE2022-95940***Nadia Elgamal - University of Calgary**Jessica Sambhi - University of Calgary**Dhruvi Patel - University of Calgary**Charuka Marasinghe - University of Calgary**Edwin Pulikkottil - University of Calgary**Kerwin Virtusio - University of Calgary**Aggrey Mwesigye - University of Calgary**Simon Li - University of Calgary***4:21PM****Multi-Regional Design and Analysis of Biomass-Driven Combined Cooling, Heating and Power Systems for Rural Communities****Technical Paper Publication: IMECE2022-96104***Philippe Schicker - Carnegie Mellon University**Heejin Cho - Mississippi State University***4:42PM****A Method to Account for the Effects of Thermal Osmosis in Pem Fuel Cells****Technical Paper Publication: IMECE2022-96126***Nicholas Ingarra - Oakland University**Krzysztof (Chris) Kobus - Oakland University**Jonathan Maisonneuve - Oakland University***5:03PM****Thermoelectric Generation From Engine Exhaust Heat in Electrified Natural Gas Trucks Part1: Modeling and Analysis on Engine System Efficiency Improvement****Technical Paper Publication: IMECE2022-96245***Ratnak Sok - Waseda University**Jin Kusaka - Waseda University**Hisaharu Nakashima - HKS Co., Ltd**Hidetaka Minagata - Tokyo Gas Co., Ltd***5:24PM****Prediction of Electrical Energy Consumption in University Campus' Residence Using a FCM-Clustered Neuro-Fuzzy Model****Technical Paper Publication: IMECE2022-96793***Oluwatobi Adeleke - University of Johannesburg**Tien-Chien Jen - University of Johannesburg*

TECHNICAL SESSIONS

TUESDAY, NOVEMBER 1

TUESDAY, NOVEMBER 1

8-13: Outstanding Early-Career Investigators in Energy Conversion and Storage Systems**08-13-01: Outstanding Early-Career Investigators in Energy Conversion and Storage Systems****10:15AM–12:00PM - CONVENTION CENTER, A225****10:15AM****Development of a Control Co-Design Modeling Tool for Marine Hydrokinetic Turbines****Invited Presentation: IMECE2022-94483***Hannah Ross - National Renewable Energy Laboratory**Matthew Hall - National Renewable Energy Laboratory**Daniel Herber - Colorado State University**Jason Jonkman - National Renewable Energy Laboratory**Athul Krishna Sundarajan - Colorado State University**Thanh Toan Tran - National Renewable Energy Laboratory**Alan Wright - National Renewable Energy Laboratory**Daniel Zalkind - National Renewable Energy Laboratory**Nick Johnson - National Renewable Energy Laboratory***10:57AM****Revealing the Mechanism of Highly Unrepeatable Internal-Short-Circuit and Thermal Runaway Triggering in Nail Penetration Test of Pouch Cells****Invited Presentation: IMECE2022-99729***Xiang Gao - The University of North Carolina at Charlotte**Jun Xu - The University of North Carolina at Charlotte***11:39AM****Characterization of Multi-Scale and Multi-Physics Behavior of Lithium Ion Batteries****Invited Presentation: IMECE2022-100201***Elham Sahraei - Temple University***8-4: Fundamentals and Applications of Thermodynamics****08-04-01: Fundamentals and Applications of Thermodynamics****10:15AM–12:00PM - CONVENTION CENTER, B230/B231****10:15AM****Maintenance Centered on Exergy and Exergoeconomic Indicators of a Preheat Train of a Crude Oil Distillation Unit****Technical Paper Publication: IMECE2022-90041***Juan Fajardo - Universidad Tecnológica de Bolívar**Camilo Negrette - Universidad Tecnológica de Bolívar**Camilo Cardona - Ecopetrol**Daniel Yabrudy - Universidad Tecnológica de Bolívar**Deibys Barreto - Universidad Tecnológica de Bolívar***10:36AM****An Energy Efficiency Condition-Based Maintenance Methodology for Refinery Process Control Room Air Conditioners****Technical Paper Publication: IMECE2022-91987***Juan Fajardo - Universidad Tecnológica De Bolívar**Hermes Ramirez-León - Instituto Universitario ITSA**Deibys Barreto - Universidad Tecnológica de Bolívar**Carlos Rico - Ecopetrol**Camilo Cardona - Ecopetrol***IMECE**[®]**ONE GREAT LEARNING EXPERIENCE.**
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TECHNICAL SESSIONS

TUESDAY, NOVEMBER 1

10:57AM

Theoretical Modeling of the Quantum Size Effects on the Behaviors of Diffusion for Ideal Gases in the Quantum Domain

Technical Paper Publication: IMECE2022-95861

Aimen Younis - The University of Memphis

11:18AM

An Experimental Setup to Study the Fundamental Phenomena Associated With Biomass Combustion

Technical Paper Publication: IMECE2022-95945

Joao Silva - Universidade do Minho

Senhorinha Teixeira - Universidade do Minho

Jose Teixeira - Universidade do Minho

11:39AM

Hybrid Parallel Feed Multi-Effect Evaporation Desalination System With Adsorption Cycle

Technical Paper Publication: IMECE2022-96683

Hassan Al-Khalifah - King Fahd University of Petroleum and Minerals

Rached Ben-Mansour - King Fahd University of Petroleum and Minerals

Mohamed Antar - King Fahd University of Petroleum and Minerals

8-3: Energy-Related Multidisciplinary

08-03-01: Energy-Related Multidisciplinary I

1:30PM–3:15PM - CONVENTION CENTER, A225

1:30PM

Determination of the Convection Heat Transfer Coefficients for Multiphase Flow on Different Sections of a Closed Piping System

Technical Presentation: IMECE2022-89396

Mahmoud Elsharafi - Midwestern State University

Benton Vidal - Midwestern State University

Tyler Leonard - Midwestern State University

1:51PM

Design and Fabrication of an Atmospheric Water Generator Based on Vapor Compression Refrigeration Cycle

Technical Paper Publication: IMECE2022-94117

Saad Alshahrani - King Khalid University

2:12PM

Development of a Holistic Data-Driven Detection and Diagnosis Approach for Operational Faults in Public Buildings

Technical Paper Publication: IMECE2022-94599

Ashraf Alghanmi - The University of Manchester

Akilu Yunusa-Kaltungo - The University of Manchester

Rodger Edwards - The University of Manchester



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TECHNICAL SESSIONS

TUESDAY, NOVEMBER 1

2:33PM

Investigation of Emission Reduction and Power Generation on Electrochemical Catalytic Membranes With the Addition of Perovskite Nanocrystals

Technical Paper Publication: IMECE2022-95571

*Aliza Willsey - Syracuse University
Kassidy Fields - Syracuse University
Thomas Welles - Syracuse University
Hanjie Lin - Syracuse University
Weiwei Zheng - Syracuse University
Jeongmin Ahn - Syracuse University*

2:54PM

A Data Driven Analysis on the Energy Performance and Efficiency of Water Treatment Plants in the United States

Technical Paper Publication: IMECE2022-96040

*Alex Callinan - Florida Institute of Technology
Hamidreza Najafi - Florida Institute of Technology
Aldo Fabregas - Florida Institute of Technology
Troy Nguyen - Florida Institute of Technology*

8-3: Energy-Related Multidisciplinary**08-03-02: Energy-Related Multidisciplinary II****1:30PM–3:15PM - CONVENTION CENTER, B230/B231****1:30PM**

Opportunities for Energy Efficiency Improvements in Small and Micro Breweries

Technical Paper Publication: IMECE2022-94374

*Laryssa Sueza Raffa - University of Technology Sydney
Nick S. Bennett - University of Technology Sydney
Lee Michael Clemon - University of Technology Sydney*

1:51PM

Life-Cycle Analysis of Electric Vehicles at United States Army Installations

Technical Paper Publication: IMECE2022-96142

*Madison Faust - United States Military Academy
Zachary Ortman - United States Military Academy
Austin Chambers - United States Military Academy
Mark Fitzpatrick - United States Military Academy
Jamir Gibson - United States Military Academy
Forde Norris - United States Military Academy
Matthias Williams - United States Military Academy
Adam Johantges - United States Military Academy
Jae Kim - United States Military Academy
Brian Riser - United States Military Academy
Brad McCoy - United States Military Academy
F. Todd Davidson - United States Military Academy*

2:12PM

Modeling Analysis on Combined Effects of VVT/VCR Engine Technology to Reduce Fuel Consumption of Light-Duty Parallel Hybrid CNG Trucks

Technical Paper Publication: IMECE2022-96282

*Ratnak Sok - Waseda University
Jin Kusaka - Waseda University
Hisaharu Nakashima - HKS Co., Ltd.
Hidetaka Minagata - Tokyo Gas Co., Ltd.*

2:33 PM

A Novel All Condensed Phase Refrigeration System

Technical Presentation: IMECE2022-99374

*Drew Lilley - University of California, Berkeley
Ravi Prasher - Lawrence Berkeley National Laboratory*



TECHNICAL SESSIONS

TUESDAY, NOVEMBER 1

2:54PM

Investigation of Adsorption, Dissociation, and Hydrogen Diffusion Through V-Ni-Zr Alloys Surface for Hydrogen Purification Through the First Principle Method

Technical Paper Publication: IMECE2022-96856

Oriyomi Opetubo - University of Johannesburg

Sunday Oyinbo - University of Johannesburg

Peter Oviroh - University of Johannesburg

Ibitoye Ayotunde - University of Johannesburg

Tien-Chien Jen - Univ Of Johannesburg

8-16: Emerging Renewable Energy Technologies**08-16-01: Emerging Renewable Energy Technologies I****3:30PM–5:15PM - CONVENTION CENTER, A225****3:30PM**

Development of Heterogeneous Catalyst From Assorted Periwinkle Snail Shells for Sustainable Biodiesel Synthesis

Technical Paper Publication: IMECE2022-88999

Oyetola Ogunkunle - University of Johannesburg

Datto Shingage - University of Johannesburg

Opeyeolu Laseinde - University of Johannesburg

3:51PM

Flame Propagation Analysis of Anhydrous and Hydrous Ethanol in an Optical Spark Ignition Engine

Technical Paper Publication: IMECE2022-89116

Fernanda Pinheiro-Martins - Technological Institute of Aeronautics

Pedro Teixeira Lacava - Technological Institute of Aeronautics

4:12PM

Performance Assessment of Tri-Reforming of Methane

Technical Paper Publication: IMECE2022-89324

Azharuddin Farooqui - Northern Illinois University

Tariq Shamim - Northern Illinois University

4:33PM

Catalyst Regeneration for Methane Pyrolysis to Produce Greenhouse-Gas-Free Hydrogen and Carbon Nanotube

Technical Presentation: IMECE2022-94328

Shang Zhai - Stanford University

Dohyung Kim - Stanford University

Eddie Sun - Stanford University

Vasudev Haribal - Susteon Inc.

Marco Gigantino - Stanford University

Andrew Tong - Susteon Inc.

Jian-Ping Shen - Susteon Inc.

Sebastian Marin-Quiros - Stanford University

Raghubir Gupta - Susteon Inc.

Matteo Cargnello - Stanford University

Arun Majumdar - Stanford University

4:54PM

Analyzing the Process of Seaweed Drying in a Drying Cabinet

Technical Paper Publication: IMECE2022-94524

Mohiodin Nazemi - University of Iceland

Rúnar Unnþórsson - University of Iceland

Christiaan Richter - University of Iceland



TECHNICAL SESSIONS

TUESDAY, NOVEMBER 1

8-16: Emerging Renewable Energy Technologies**08-16-02: Emerging Renewable Energy Technologies II****3:30PM–5:15PM - CONVENTION CENTER, B230/B231****3:30PM****Producing High-Strength Pellets From Seaweed, Sawdust, and Hay for the Purpose of Gasification****Technical Paper Publication: IMECE2022-94528***Mohiodin Nazemi - University of Iceland**Aysan Safavi - University of Iceland**Eyja Camille P. Bonthonneau - University of Iceland**Christiaan Petrus Richter - University of Iceland**Rúnar Unnþórsson - University of Iceland***3:51PM****Improving the Yield of Biodiesel Production Using Waste Vegetable Oil Considering the Free Fatty Acid Content****Technical Paper Publication: IMECE2022-95003***Saanyol Ityokumbul Igbax - Tennessee Tech University**Daniel Swartling - Tennessee Tech University**Ahmed Elsayy - Tennessee Tech University**Stephen Idem - Tennessee Tech University***4:12PM****Electrical Power Generation From Biogas Upgrading****Technical Paper Publication: IMECE2022-95280***Morgan Smith - Saint Martin's University**Zachary Musgrove - Saint Martin's University**Yuxin Song - Saint Martin's University**Hao Hu - Saint Martin's University**Shawn Duan - Saint Martin's University***4:33PM****Variation of Power Output From an OTEC Power Plant Based on Long Term Sea Surface Temperatures Data Analysis****Technical Paper Publication: IMECE2022-97126***Melvin Costa - The University of the South Pacific**Reemal Prasad - The University of the South Pacific**Muzammil Ali - The University of the South Pacific**M.G.M. Khan - The University of the South Pacific**Antoine De Ramon N'Yeurt - The University of the South Pacific**Mohammed Rafiuddin Ahmed - The University of the South Pacific***IMECE**[®]**ONE GREAT LEARNING EXPERIENCE.**
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TECHNICAL SESSIONS

WEDNESDAY, NOVEMBER 2

WEDNESDAY, NOVEMBER 2

8-11: CMS-General Combustion and Fire

08-11-01: CMS-General Combustion and Fire

10:45AM–12:30PM - CONVENTION CENTER, A223

10:45AM

Combustion and Vaporization of Deformable Fuel Droplets Using Direct Numerical Simulation**Technical Paper Publication: IMECE2022-94475***Meha Setiya - Virginia Polytechnic Institute and State University**John A. Palmore Jr. - Virginia Polytechnic Institute and State University*

11:06AM

Calibration and Uncertainty Assessment Tool With Uncertainty Minimization for Optimal High-Speed Camera Settings in Flame Propagation**Technical Paper Publication: IMECE2022-95252***James Shaffer - West Virginia University**Omid Askari - West Virginia University*

11:27AM

Combustion Characteristics of Single Isolated Fuel Droplets of Different Diesel-Biodiesel Blends Derived From Waste Vegetables Oil and Animal Fat**Technical Paper Publication: IMECE2022-95410***A.S.M. Sazzad Parveg - The University of Iowa**Albert Ratner - The University of Iowa*

11:48AM

Effects of Mean Pressure Gradient and Free-Stream Turbulence on a Bluff Body Stabilized Premixed Flame**Technical Presentation: IMECE2022-95609***Tyler Souders - University of Colorado Boulder**Samuel Whitman - University of Colorado Boulder**Michael Meehan - University of Colorado Boulder**Peter Hamlington - University of Colorado Boulder*

12:09PM

Ammonia for Industrial Combustion**Technical Paper Publication: IMECE2022-96499***Steve Londerville - John Zink Co. LLC**Matt Whelan - John Zink Co. LLC**Charles Baukal - John Zink Co. LLC**Ali Gueniche - John Zink International Luxembourg Sàrl**Michel Haag - John Zink International Luxembourg Sàrl**Paul Newman - Hamworthy Combustion Engineering***8-10: Nuclear Energy: Plants, Design, Analysis, and Safety****08-10-01: Nuclear Energy: Plants, Design, Analysis, and Safety**

10:45AM–12:30PM - CONVENTION CENTER, A222

10:45AM

Computational Modeling of Multi-Pass Rolling Parameters Effect on Resulting Fuel Foil Shape**Technical Paper Publication: IMECE2022-95081***Taylor Mason - Pacific Northwest National Laboratory**Kyoo Sil Choi - Pacific Northwest National Laboratory**Ayoub Soulami - Pacific Northwest National Laboratory**Kenneth Johnson - Pacific Northwest National Laboratory**Kriston Brooks - Pacific Northwest National Laboratory**Naveen Karri - Pacific Northwest National Laboratory**Vineet Joshi - Pacific Northwest National Laboratory*

TECHNICAL SESSIONS

WEDNESDAY, NOVEMBER 2

11:06AM**Assessing and Demonstrating the Potential for Implementation of Distributed Ledger Technology in the Nuclear Power Plant Lifecycle****Technical Paper Publication: IMECE2022-95225**

Priyanka Pandit - North Carolina State University
 Daniel Nevius - North Carolina State University
 Vibhav Srivaths - North Carolina State University
 Mihai Diaconeasa - North Carolina State University

11:27AM**Adsorption of Hydrogen Isotopes on Novel Nanomaterials****Technical Paper Publication: IMECE2022-96589**

Suheyb Polat - Kennesaw State University
 Aaron Stinebaugh - Kennesaw State University
 Jungkyu Park - Kennesaw State University

11:48AM**Overview of Base Model in Parametric Studies Specific to Performance of U-Mo Plates****Technical Paper Publication: IMECE2022-93718**

Hakan Ozaltun - Idaho National Laboratory
 Hee Seok Roh - Argonne National Laboratory
 Walid Mohamed - Argonne National Laboratory

8-5: 4E Analysis and Optimization of Energy Systems**08-05-01: 4E Analysis and Optimization of Energy Systems****2:00PM–3:45PM - CONVENTION CENTER, A222****2:00PM****Comparative Analysis of Coefficient of Performance (COP) Correlations of Single-Effect Vapor Absorption Refrigeration (VAR) Cycle****Technical Paper Publication: IMECE2022-93943**

Muhammad Saad Khan - Texas A&M University at Qatar
 Sambhaji Kadam - Texas A&M University at Qatar
 Alexios-Spyridon Kyriakides - Centre for Research and Technology Hellas
 Ibrahim Hassan - Texas A&M University at Qatar
 Athanasios Papadopoulos - Centre for Research and Technology Hellas
 Mohammad Azizur Rahman - Texas A&M University at Qatar
 Panos Seferlis - Aristotle University of Thessaloniki

2:21PM**Effect of Flapper Valve on the Performance of Hydraulic Ram Pump****Technical Paper Publication: IMECE2022-95901**

Ashokkumar Sharma - University of Arkansas at Little Rock
 Dipak Banerjee - University of Arkansas at Little Rock
 Srikanth Pidugu - University of Arkansas at Little Rock

2:42PM**Exergy Analysis of Photovoltaics Coupled With Electrochemical Energy Storage for Lunar Power Applications****Technical Paper Publication: IMECE2022-96993**

Phillip Dyer - The University of Alabama in Huntsville
 Griffin Smith - The University of Alabama in Huntsville
 George Nelson - The University of Alabama in Huntsville

3:03PM**Exergy Analysis of a Kilopower Nuclear Reactor System for Lunar Power Applications****Technical Paper Publication: IMECE2022-97023**

Griffin Smith - The University of Alabama in Huntsville
 Phillip Dyer - The University of Alabama in Huntsville
 George Nelson - The University of Alabama in Huntsville



TECHNICAL SESSIONS

WEDNESDAY, NOVEMBER 2

3:24PM

Technoeconomic Analysis of Decentralized Solar Desalination: The Role of Energy Storage and Brine Management

Technical Presentation: IMECE2022-99661
Akanksha Menon - Georgia Institute of Technology

8-7: Energy Systems Components**08-07-01: Energy Systems Components****2:00PM–3:45PM - CONVENTION CENTER, A223****2:00PM**

Modeling Effects of Occupants' Time-Off Behavior in Buildings on Load Calculation and Energy Consumption Modeling

Technical Paper Publication: IMECE2022-94363
Lakshmi Prasanna Pedarla - Kennesaw State University
Javad Khazaii - Kennesaw State University

2:21PM

Design Strategies for Flywheel Energy Storage Systems in EV Fast Charging

Technical Paper Publication: IMECE2022-94653
Francisco Basaure - University of Alberta
Pierre Mertiny - University of Alberta

2:42PM

Geothermal Application of Overhauled and Regenerated and Steam Turbine

Technical Paper Publication: IMECE2022-94916
Roberto Capata - Sapienza University of Roma
Alfonso Calabria - University eCampus
Michele Reale - University eCampus

3:03PM

Optimized HVAC Air Distribution for Improved Air Quality Using CFD Analysis

Technical Paper Publication: IMECE2022-95730
Hussein Kokash - Wayne State University
Mihai Burzo - University of Michigan-Flint
Gbemeh Agbaglah - Wayne State University
Fardeen Mazumder - University of Michigan-Flint

8-15: Wind and Water Power**08-15-01: Wind and Water Power****4:00PM–5:45PM - CONVENTION CENTER, A223****4:00PM**

Review of Wave Energy Converter Power Take-Off Systems, Testing Practices, and Evaluation Metrics

Technical Paper Publication: IMECE2022-94077
Nathan Tom - National Renewable Energy Laboratory

4:21PM

A Robust Hybrid Machine Learning-Based Modeling Technique for Wind Power Curve Generation

Technical Paper Publication: IMECE2022-94173
Amit Banerjee - Penn State University Harrisburg
Issam Abu-Mahfouz - Penn State University Harrisburg
Jianyan Tian - Taiyuan University of Technology
Ahm Esfakur Rahman - Penn State University Harrisburg



TECHNICAL SESSIONS

WEDNESDAY, NOVEMBER 2

4:42PM

An Efficient Time-Domain Model to Simulate Parametric Resonances in a Floating Body Free to Move in Six Degrees of Freedom

Technical Paper Publication: IMECE2022-94502
Adi Kurniawan - The University of Western Australia
Thanh Toan Tran - National Renewable Energy Laboratory
Yi-Hsiang Yu - National Yang Ming Chiao Tung University

5:03PM

Investigation of the Leading Edge Erosion of Wind Turbine Blades Using Multivariant Analysis Method

Technical Paper Publication: IMECE2022-94744
Abdullah F. Alajmi - Kuwait University
M. Ramulu - University of Washington

8-9: Thermal Energy Storage

08-09-01: Thermal Energy Storage

4:00PM–5:45PM - CONVENTION CENTER, A222

4:00PM

Thermal Performance Phase Change Material Based Heat Exchangers

Technical Paper Publication: IMECE2022-94810
Abhinay Soanker - Lehigh University
Alparslan Oztekin - Lehigh University

4:21PM

Salt Hydrate Composites for Thermochemical Energy Storage in Buildings

Technical Presentation: IMECE2022-99292
Erik Barbosa - Georgia Institute of Technology
Akanksha Menon - Georgia Institute of Technology

4:42PM

Thermal Analysis of a Latent Heat Thermal Energy Storage Unit Enhanced With Porous Annular Fins

Technical Presentation: IMECE2022-99359
Kyle Shank - Gannon University
Jessica Bernat - Gannon University
Ethan Regal - Gannon University
Shiva Pandiri - Gannon University
Saeed Tiari - Gannon University

5:03PM

Shape Stable Polymer Composites for Medium Temperature Thermal Storage: Detailed Heat Transfer and Scale Up

Technical Presentation: IMECE2022-99377
Souvik Roy - University of California, Merced
James Palko - University of California, Merced
Gerardo Diaz - University of California, Merced
Roland Winston - University of California, Merced

5:24PM

Statistical Analysis of Liquid-to-Solid Nucleation of Magnesium Chloride Hexahydrate for Prediction of Supercooling in Thermal Energy Storage Applications

Technical Presentation: IMECE2022-99532
Youngsup Song - Lawrence Berkeley National Laboratory
Drew Lilley - Lawrence Berkeley National Laboratory
Sumanjeet Kaur - Lawrence Berkeley National Laboratory
Ravi Prasher - Lawrence Berkeley National Laboratory



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TECHNICAL SESSIONS

Track 9: Engineering Education Sponsored by the Process Industries Division

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: Sustainable, Ethical dimensions and Safety issues in Engineering Education
- 9-5: Applied Mechanics, Dynamic Systems and Control Engineering
- 9-6: Fluid Mechanics, Heat Transfer, and Energy Systems
- 9-7: Problem Solving in Engineering Education, Research and Practice
- 9-8: Distance/Online Engineering Education, Models and Enabling Technologies
- 9-9: Pre-College (K-12) STEM, RET - University, School and Industry Alliance (USIA)
- 9-10: Teaching Laboratories, Hands-on Experiences, Embedding Novel Manufacturing Concepts in ME Programs, and Technology-Aided Lecturing
- 9-11: Engineering Research Innovation and Research Experiences for Undergraduates
- 9-12: Competencies for Industry 4.0 and Learning Factories
- 9-13: Approaches and Methodologies for Applying for Public and Private Grants in Engineering Education
- 9-14: Aeronautics and Space Applications in Engineering Education
- 9-15: Materials, Mechanics of Materials, and Structures, Experimental and Numerical Methods, and Advanced Materials in Engineering Education
- 9-16: Energy Efficiency, Renewable Energies, Sustainability and Climate Changes

ACKNOWLEDGMENT TRACK ORGANIZERS

Track Organizer: Salim Azzouz

Track Co-Organizer: Anabela Alves

Track Co-Organizer: Subha Kumpaty

TOPIC ORGANIZERS

Aaron Armstrong, Milwaukee School of Engineering
Anabela Alves, University of Minho, Portugal
Emine Celik Foust, York College of Pennsylvania
Hadi Ali, Embree Riddle Aeronautical University
Hephzibah Kumpaty, University of Wisconsin Whitewater
Mohammad Mahinfalah, Milwaukee School of Engineering
Pranaya Pokharel, Midwestern State University
Salim Azzouz, Midwestern State University
Subha Kumpaty, Milwaukee School of Engineering
Vedang Chauhan, Western New England University
Wael Mokhtar, Grand Valley State University
Zeki Ilhan, Midwestern State University

SESSION ORGANIZERS

Aaron Armstrong - Milwaukee School of Engineering
Amir Karimi - The University of Texas at San Antonio
Anabela Alves - University of Minho
Emine Celik Foust - York College of Pennsylvania
Hadi Ali - Embry-Riddle Aeronautical University
Hephzibah Kumpaty - University of Wisconsin-Whitewater
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



TECHNICAL SESSIONS

WEDNESDAY, NOVEMBER 2

TRACK 9

WEDNESDAY, NOVEMBER 2

9-1: Curriculum Innovations, Pedagogy, and Learning Methodologies

09-01-01: Curriculum Innovations, Pedagogy, and Learning Methodologies

10:45AM–12:30PM - CONVENTION CENTER, A224

10:45AM

Future of Manufacturing Roles

Technical Paper Publication: IMECE2022-96344

*Ashley Huderson - ASME**Erin Peiffer - Engineering for Change, LLC*

11:06AM

Preparing Generation Z: Beyond Technologies

Technical Paper Publication: IMECE2022-95513

*Celina Leao - Centro Algoritmi, University of Minho**Anabela Alves - Centro Algoritmi, University of Minho**Filomena Soares - Centro Algoritmi, University of Minho**Vinicius Silva - Centro Algoritmi, University of Minho*

11:27AM

Selection of Industry 4.0 Competencies for Implementation in a New Mechanical Engineering Undergraduate Program

Technical Paper Publication: IMECE2022-94456

*Karim Muci-Kuchler - Texas State University**Anahita Emami - Texas State University**Jesus Jimenez - Texas State University*

11:48AM

Empowering Master Students to Pull What They Want to Learn

Technical Paper Publication: IMECE2022-94798

*Anabela Alves - University of Minho**Manuel Lopes Nunes - University of Minho**Ana Cristina Braga - University of Minho*

12:09PM

Improvement of API Program to Evaluate Three Dimensional Cad Models

Technical Paper Publication: IMECE2022-96096

Sunghwan Joo - Grand Valley State University

9-4: Sustainable, Ethical dimensions and Safety issues in Engineering Education

09-04-01: Fluid Mechanics, Aerospace, Thermodynamics, Heat Transfer, and Energy Systems

10:45AM–12:30PM - CONVENTION CENTER, A225

10:45AM

Integration of Data Science Into Thermal-Fluids Engineering Education

Technical Paper Publication: IMECE2022-88193

*Han Hu - University of Arkansas**Connor Heo - University of Arkansas*

11:06AM

Industry-Based Thermodynamics Case Study on Refrigeration Cycle

Technical Paper Publication: IMECE2022-88201

Emine Foust - United States Military Academy

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TECHNICAL SESSIONS

WEDNESDAY, NOVEMBER 2

11:27AM**EXCEL VBA for Thermal Science Applications****Technical Paper Publication: IMECE2022-95394***J.H. Jones - Liberty University**T.V. Eldredge - Liberty University***11:48AM****Students Difficulties in Understanding Limitation of Application of Thermal Resistance Relations in an Introductory Heat Transfer Course****Technical Presentation: IMECE2022-95432***Amir Karimi - The University of Texas***12:09PM****Development of a Small Project on Spray Combustion for an Undergraduate Fluid Dynamics Class****Technical Paper Publication: IMECE2022-95604***John Palmore Jr. - Virginia Tech***9-1: Curriculum Innovations, Pedagogy and Learning Methodologies****09-01-02: Curriculum Innovations, Pedagogy and Learning Methodologies****2:00PM–3:45PM - CONVENTION CENTER, A224****2:00PM****Outcomes of an NSF S-Stem Grant to Support Students Enrolling in a Multi-Disciplinary Engineering Program****Technical Presentation: IMECE2022-98951***Shuvra Das - University of Detroit Mercy***2:21 PM****Characterizing the Training and Evaluation of Graduate Teaching Assistants (GTAs) at Research-Intensive Universities: Highlighting Best Practices and Opportunities for Reform****Technical Paper Publication: IMECE2022-91742***Ankit Saxena - Penn State University**Larkin Hood - Penn State University**Guha Manogharan - Penn State University**Catherine Berdanier - Penn State University***2:42PM****Students Performance in an Engineering Course Following a Year and Half of Online Instruction****Technical Presentation: IMECE2022-95429***Amir Karimi - The University of Texas***3:03PM****Optimizing the Curriculum in a Heating Ventilation and Air Conditioning Class With Realistic Labs, Projects, and Interesting Realistic Problems to Enhance Learning****Technical Paper Publication: IMECE2022-95606***Kyle Larsen - Eastern Washington University**Hessam Gharavi - Eastern Washington University**Robert Gerlick - Eastern Washington University**Matthew Michaelis - Eastern Washington University***IMECE**[®]**ONE GREAT LEARNING EXPERIENCE.**
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TECHNICAL SESSIONS

WEDNESDAY, NOVEMBER 2

3:24PM**Inclusion of Continuous Annuities in Engineering Economics Instruction****Technical Paper Publication: IMECE2022-96205***Aaron Armstrong - Milwaukee School of Engineering***9-4: Sustainable, Ethical Dimensions and Safety Issues in Engineering Education****09-04-02: Fluid Mechanics, Aerospace, Thermodynamics, Heat Transfer, and Energy Systems****2:00PM–3:45PM - CONVENTION CENTER, A225****2:00PM****A Case Study of Collaborative Teaching and Learning in Engineering Experimentation: the Hydrostatic Vacuum Tube****Technical Paper Publication: IMECE2022-97069***Kamau Wright - Cooper Union**Wootton David - Cooper Union**George Sidebotham - Cooper Union**Melody Baglione - Cooper Union**Reid Chambers - Cooper Union**Jason He - Cooper Union**Zachary Potoskie - Cooper Union**Lionel Gilliar-Schoenenberger - Cooper Union***2:21PM****Industry-Based Thermodynamics Case Study on Refrigeration Cycle****Technical Presentation: IMECE2022-98430***Emine Foust***2:42PM****Applying Computational Tools to Improve Student Learning Experience in Undergraduate Mechanical Engineering Courses****Technical Presentation: IMECE2022-99545***Jian Zhang - University of Wisconsin Green Bay**Heejin Cho - Mississippi State University**Pedro Mago - West Virginia University***3:03PM****Senior Capstone Design Research Project: Study of Combustion of Paraffine-Based Fuels in Hybrid Propellant Rocket Engine****Technical Paper Publication: IMECE2022-95172***Viatcheslav Naoumov - Central Connecticut State University**Nidal Al-Masoud - Central Connecticut State University**Mohammad Mahjoob - Central Connecticut State University***3:24PM****Methodology for the Design of Demonstrative Didactic Prototypes for the Teaching of Renewable Energies Based on Education for Sustainable Development (ESD)****Technical Paper Publication: IMECE2022-96149***Juan Peralta - Escuela Superior Politecnica del Litoral**Emerita Delgado - Escuela Superior Politecnica del Litoral**Fausto Maldonado - Escuela Superior Politécnica del Litoral**Galo Durazno - Escuela Superior Politecnica del Litoral**Livington Miranda-Delgado - Escuela Superior Politecnica Litoral**Alexander Prieto - Escuela Superior Politecnica del Litoral**Jose Reinoso - Escuela Superior Politecnica del Litoral***9-8: Distance/Online Engineering Education, Models and Enabling Technologies****09-08-01: General Topics in Engineering Education****IMECE**[®]**ONE GREAT LEARNING EXPERIENCE.**
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TECHNICAL SESSIONS

WEDNESDAY, NOVEMBER 2

2:00PM–3:45PM - CONVENTION CENTER, C160A

2:00PM

**3D Printing for Innovative Engineering Solutions
“The Environmental Challenge”****Technical Paper Publication: IMECE2022-94829***Yasser Al Hamidi - Texas A and M University at Qatar**Marcin Kozusznik - Texas A and M University at Qatar**Mamoun Al-Rawashdeh - Texas A and M University
at Qatar*

2:21PM

**Introduction to Composite Materials in a Finite
Element Method Course****Technical Paper Publication: IMECE2022-95682***Luis Monterrubio - Robert Morris University*

2:42PM

**Reimagining Engineering Education to Fill the
Talent Pipeline****Technical Presentation: IMECE2022-99371***Shuvra Das – University Of Detroit**Darrell Kleinke - University of Detroit Mercy**David Pistrui - University of Detroit Mercy***9-2: Globalization of Engineering and Study Abroad
Education****09-02-01: Accreditation, Globalization, Ethics, and
Safety of Engineering**

4:00PM–5:45PM - CONVENTION CENTER, A224

4:00PM

**Development of a Continuous Improvement Tool for
Outgoing Erasmus: First Results****Technical Paper Publication: IMECE2022-96044***Violeta Carvalho - Universidade do Minho**Carla Rocha - Universidade do minho**Jorge Campinos - Universidade do Minho**Senhorinha Teixeira - University of Minho**Cristina Rodrigues - Universidade do Minho*

4:21PM

**Promoting Globalization of Engineering by
Developing Students’ Potential for Productive
Communication and Interaction Using Transactional
Analysis in a Historically Black College and University****Technical Paper Publication: IMECE2022-94253***Sampson Addo - University of the District of Columbia**Pawan Tyagi - University of the District of Columbia**Samba Gaye - University of the District of Columbia**Kaiya Baker - University of the District of Columbia*

4:42PM

**Viable and Sustainable Measures of Meeting Program
Outcomes Related to Communication in Graduate
Capstone Projects and Specialty Papers****Technical Paper Publication: IMECE2022-90077***Gary Shimek - Milwaukee School of Engineering**Subha Kumpaty - Milwaukee School of Engineering*

5:03PM

**Recycling of Campus Solid Wastes Into a Low-Cost
Green Instructional Equipment****Technical Paper Publication: IMECE2022-94991***Ronald Galindo - Cebu Technological University**Jun-Jun Obiso - Cebu Technological University**Aian Rey Caladcad - Cebu Technological University**Edgar Tibay - Cebu Technological University*

5:24PM

**Making a Case for Innovative Assessment
Frameworks for Large Cohorts of Undergraduate
Engineering Students on Management Units****Technical Paper Publication: IMECE2022-89109***Akilu Yunusa-Kaltungo - The University of Manchester**Rukaiyatu Mohammed Jungudo - The University
of Manchester***IMECE**[®]**ONE GREAT LEARNING EXPERIENCE.**
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TECHNICAL SESSIONS

THURSDAY, NOVEMBER 3

THURSDAY, NOVEMBER 3

Track 9: Engineering Education

Thursday, November 3, 9:15AM-10:00AM

Room: A216

Greater Columbus Convention Center

Title: Bio-Engineering: Pros and Cons of Navigating an Interdisciplinary Field*Dr. Gunjan Agarwal
The Ohio State University***9-3: Engineering Accreditation, Curricular Reforms and Revisions, Assessment, and ABET****09-03-01: Applied Mechanics, Dynamic Systems, and Control Engineering**

10:15AM–12:00PM - CONVENTION CENTER, A216

10:15AM

Open-Source Virtual Labs for Undergraduate Mechanical Vibrations and Control Theory Courses**Technical Paper Publication: IMECE2022-90008**
*Andrea Contreras-Esquen - Kennesaw State University
Tris Utschig - Kennesaw State University
Ayse Tekes - Kennesaw State University*

10:36AM

Benchmarking Various Nonlinear Control Design Techniques for a Two-Link Planar Robot Arm**Technical Paper Publication: IMECE2022-95524**
Zeki Ilhan - Northwestern State University

10:57AM

Virtual Vibrations Laboratory**Technical Paper Publication: IMECE2022-94574**
*Ali Mohammadzadeh - Grand Valley State University
Salim Haidar - Grand Valley State University*

11:18AM

Understanding Surface Form Error: Beyond the GD&T Circularity or Roundness Callout**Technical Paper Publication: IMECE2022-96897**
*Suhash Ghosh - University of Hartford
Chittaranjan Sahay - University of Hartford*

11:39 AM

Design of a Clutching and Braking System to Automate a Chain-Coupled Dual Planetary Gearing Transmission**Technical Paper Publication: IMECE2022-95227**
*Megan Cann - Northwestern State University
Robert Speed - Northwestern State University
Abraham Moreno - Northwestern State University
Salim Azzouz - Northwestern State University***9-5: Applied Mechanics, Dynamic Systems, and Control Engineering****09-05-01: Distance/Online, Problem Solving, Research Methodologies, Models and Enabling Technologies in Engineering Education**

2:00PM–3:45PM - CONVENTION CENTER, A216

2:00PM

Considerations for Developing an Engaging Management Curriculum for Undergraduate Engineering Students During and Post Covid-19: A Case of Operations Management at University of Manchester**IMECE**[®]**ONE GREAT LEARNING EXPERIENCE.**
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TECHNICAL SESSIONS

THURSDAY, NOVEMBER 3

Technical Paper Publication: IMECE2022-88399

Akilu Yunusa-Kaltungo - The University of Manchester
Nafisatu Irene Okhade - The University of Manchester
Rukaiyatu Mohammed Jungudo - The University of Manchester

2:21PM

Experiential Learning for Undergraduate Students Through Collaborative Capstone Projects on Advanced Manufacturing
Technical Paper Publication: IMECE2022-94379

Jiajun Xu - University of the District of Columbia
Devdas Shetty - University of the District of Columbia
Pablo Sanchez Guerrero - University of the District of Columbia

2:42PM

Part Metrology and Defect Detection Using Machine Vision
Technical Paper Publication: IMECE2022-95082

Anthony Granitto - Western New England University
Vedang Chauhan - Western New England University

3:03PM

Miniaturized Models in Engineering Education
Technical Paper Publication: IMECE2022-95385

N.G.S.M. Durgesj - Hyderabad Institute of Technology and Management
Siva Prasad Kowdodi - Hyderabad Institute of Technology and Management

3:24PM

Improving Self-Efficacy of Financially Disadvantaged Students via Autonomous Design and Build Projects
Technical Paper Publication: IMECE2022-97040

Maxwell Chumley - Michigan State University
Shabbir Choudhuri - Grand Valley State University
Paul Plotkowski - Grand Valley State University
Sanjivan Manoharan - Grand Valley State University

9-6: Fluid Mechanics, Heat Transfer, and Energy Systems
09-06-01: Teaching Laboratories, Hands-on Experiences, Embedding Novel Manufacturing Concepts in ME Programs, and Technology-Aided Lecturing
2:00PM–3:45PM - CONVENTION CENTER, A214/A215**2:00PM**

Experimental Core Flooding Test for Formation Damage During Gel Treatment
Technical Paper Publication: IMECE2022-89189

Mahmoud Elsharafi - Midwestern State University
Jesse Green - Midwestern State University

2:21PM

Learning by Doing in Dynamics and Mechanical Vibrations Courses Using 3D Printed Equipment
Technical Paper Publication: IMECE2022-94180

Thuong Tran - Kennesaw State University
Tinh Tran - Kennesaw State University
Kevin Tran - Kennesaw State University
Karena Oun - Kennesaw State University
Ayse Tekes - Kennesaw State University

2:42PM

Five Key Attitudes for a Successful Co-Op: The Value of Cooperative Education Within an Undergraduate Program
Technical Paper Publication: IMECE2022-94608

Anakin Schneider - Rochester Institute of Technology
Patricia Iglesias - Rochester Institute of Technology

3:03PM

Automation of a Dual Planetary Gearing Transmission Using Control Mechanisms and a Programmable Logic Controller

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TECHNICAL SESSIONS

THURSDAY, NOVEMBER 3

Technical Paper Publication: IMECE2022-95173

Olivia Fadow - Northwestern State University
Skylar Leonard - Northwestern State University
Salim Azzouz - Northwestern State University

3:24PM

Design of a Water Distribution System as an Innovative Approach for Effective Engagement of a Multi-Disciplinary Course-Free Undergraduate Engineering Students

Technical Paper Publication: IMECE2022-95866

Taha Kubbar - Texas A&M University at Qatar
Osamah Hindi - Texas A&M University at Qatar
Elizabeth Abraham - Texas A&M University at Qatar
Khaled Elsaid - Texas A&M University at Qatar
Yasser Al Hamidi - Texas A&M University at Qatar

9-6: Fluid Mechanics, Heat Transfer, and Energy Systems

09-06-02: Teaching Laboratories, Hands-on Experiences, Embedding Novel Manufacturing Concepts in ME Programs, and Technology-Aided Lecturing

4:00PM–5:45PM - CONVENTION CENTER, A214/A215**4:00PM**

Flexible Drilling/Reaming Manufacturing System Using a Kawasaki Robot and a Cognex Vision Inspection System

Technical Paper Publication: IMECE2022-96933

Cameron Calhoun - Northwestern State University
Quentin Scharfenberg - Northwestern State University
Jan Brink - Northwestern State University

4:21PM

Mechanical Engineering Technology Teaching Labs Development: Nondestructive Testing of Subtractive Manufactured Metal Components

Technical Presentation: IMECE2022-98962

Zhiyuan Yu - Miami University
Ayodele Abatan - Miami University
Gary Drigel - Miami University

4:42PM

An Undergraduate Research Study: Effect of Welding Methods and Weld Puddle Manipulation on the Tensile Strength of the Welded Joints

Technical Paper Publication: IMECE2022-94557

Jordan Kopac - Milwaukee School of Engineering
Mohammad Mahinfalah - Milwaukee School of Engineering
Matt Schaefer - Milwaukee School of Engineering

5:03PM

An Experiential Design Thinking Course for Freshmen Mechanical Engineering Students

Technical Paper Publication: IMECE2022-97098

Sridhar Condoor - Saint Louis University
Jenna Gorlewicz - Saint Louis University

5:24PM

Innovations for Clutching and Shifting in Formula-Style Drivetrains

Technical Paper Publication: IMECE2022-90587

Pranaya Pokharel - Northwestern State University
Jacob Rowland - Northwestern State University
Luis Gonzalez - Northwestern State University
Trevor Snyder - Northwestern State University



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TECHNICAL SESSIONS

THURSDAY, NOVEMBER 3

9-7: Problem Solving in Engineering Education, Research, and Practice**09-07-01: Pre-College (K-12) STEM, RET, University Industry Alliance, Research Innovation, and Experiences for Undergraduates****4:00PM–5:45PM - CONVENTION CENTER, A216****4:00PM****A Stem Roadmap for Pre-Collegiate Engineering Students****Technical Paper Publication: IMECE2022-94955***Ali Gharib - Qatar Academy for Science and Technology**Nayef Alyafei - Texas A&M University at Qatar***4:21PM****Longitudinal Data-Informed Characterization of the Mechanical Engineering Profession for a Pre-College Student Audience****Technical Presentation: IMECE2022-99102***Frank Shih - Seattle University**Dylan Chow - Mountain View High School***4:42PM****Summer Grants ‘Verão Com Ciência,’ From Foundation for Science and Technology, in Portugal: Experience and Achievements****Technical Paper Publication: IMECE2022-96056***Nelson Rodrigues - University of Minho**Inês Teixeira - Universidade do Minho**Violeta Carvalho - Universidade do Minho**Inês Abreu - Universidade do Minho**Inês Gonçalves - University of Minho**Diogo Graçoeiro - Universidade do Minho**Rita Amaral - Universidade do Minho**João Marques - University of Minho**João Silva - Universidade do Minho**Ana Ferreira - Universidade do Minho**José Teixeira - University of Minho**Filipe Alvelos - Universidade do Minho**Cristina Rodrigues - Universidade do Minho**Senhorinha Teixeira - Universidade do Minho***5:03PM****Assessing Undergraduate Students’ Level of Awareness of Commercialization of Engineering Research Innovation at a Historically Black College and University****Technical Paper Publication: IMECE2022-95446***Sampson Addo - University of the District of Columbia**Pawan Tyagi - University of the District of Columbia**Eva Mutunga - University of the District of Columbia***5:24PM****Introducing Integral Engineering Skillsets to the Diverse Population of Underrepresented Students at the University of the District of Columbia via the NASA Human Exploration Rover Challenge****Technical Paper Publication: IMECE2022-96182***Voss Harrigan - University of the District of Columbia**Jiajun Xu - University of the District of Columbia**Sasan Haghani - University of the District of Columbia*

TECHNICAL SESSIONS

Track 10: Fluids Engineering Sponsored by the Fluids Engineering Division

Topics:

- 10-1: Electric, Magnetic and Thermal Phenomena in Micro and Nano-Scale Systems
- 10-2: Fluid Mechanics and Rheology of Nonlinear Materials and Complex Fluids
- 10-3: Fundamental Issues and Perspectives in Fluid Mechanics
- 10-4: CFD Applications for Optimization and Controls
- 10-5: Fluid Engineering in Micro- and Nanosystems
- 10-6: Flow and Thermal Processes in Internal Multiphase Flows
- 10-7: Recent Developments in Multiphase Flow
- 10-8: Multiphase Flow with Bio-applications
- 10-9: Industrial Flows
- 10-10: Wind Turbines Aerodynamics and Control
- 10-11: Measurement and Modeling of Environmental Flows
- 10-12: Fluid Measurements and Instrumentation
- 10-13: Advanced Research in Marine and Aerospace Lifting Surfaces
- 10-14: Young Engineers Paper (YEP) Contest

ACKNOWLEDGMENT TRACK ORGANIZERS

Track Organizer: Kamran Siddiqui, Western University

Track Co-Organizer: Marianne Francois, Los Alamos National Laboratory

TOPIC ORGANIZERS

Alexandrina Untaroiu, Virginia Tech

Asif Salahuddin, General Motors

B. Terry Beck, Kansas State University

Bertrand Rollin, Lawrence Livermore National Laboratory

Boris Khusid, NJIT

Casey Harwood, University of Iowa

Charlie Zheng, Utah State University

Dennis A. Siginer, Universidad de Santiago de Chile

Ernesto Primera, University of Delaware

Haibo Dong, University of Virginia

Huixuan Wu, University of Kansas

Iskender Sahin, New York University

Ivaylo (Ivo) Nedyalkov, University of New Hampshire

Javid Bayandor, University of Buffalo

Jingsen Ma,

Judith Bamberger, Pacific Northwest National Laboratory

Kashif Nawaz, University of Oklahoma

Keith Walter, University of Arkansas

Kevin Anderson, CalPoly Pomona

Konstantin Matveev, Washington State University

Majid Rashidi, Cleveland State University

Marianne Francois, Los Alamos National Laboratory

Martin Wosnik, University of New Hampshire

Mhamed Boutaous, INSA

Ning (Michael) Zhang, McNeese State University

Philipp Epple, Coburg University

Prahlad Menon

Ravinder Yerram, General Electric

Robert Kunz, Penn State University

S. A. Sherif, University of Florida

Salem Bouhairie, HTRI

Sangjin Ryu, University of Nebraska-Lincoln

Sayavur Bakhtiyarov, New Mexico Tech

Siddharth Talapatra, HTRI

Soroor Karimi, University of Tulsa

Stamatios Pothos, TSI

Stathis Michaelides, Texas Christian University

Stefan aus der Wiesche, Muenster University



TECHNICAL SESSIONS

SESSION ORGANIZERS

- Boris Khusid - NJIT New Jersey Institute of Technology*
Charlie Zheng - Utah State University
Deify Law - California State University, Fresno
Dennis Siginer - Universidad de Santiago de Chile
Isaac Raya - Rochester Institute of Technology
Judith Bamberger - Pacific Northwest National Laboratory
Kamran Siddiqui - University of Western Ontario
Ning Zhang - McNeese State University
Prahit Dubey - Romeo Power Technology
Rasim Guldiken - University of South Florida
Ravi Yerram - General Electric
S.A. Sherif - University of Florida
Sijun Zhang - ESI CFD, Inc.
Soroor Karimi - The University of Tulsa
Yang Liu - The City College of New York



TECHNICAL SESSIONS

TUESDAY, NOVEMBER 1

TRACK 10

TUESDAY, NOVEMBER 1

10-2: Fluid Mechanics and Rheology of Nonlinear Materials and Complex Fluids

10-02-01: Fundamental Issues and Perspectives in Fluid Mechanics

10:15AM–12:00PM - CONVENTION CENTER, B230/B231

10:15AM

Controlling the Flow Structures Within a Scramjet Isolator With Backpressure Manipulations

Technical Paper Publication: IMECE2022-96157

*Frederick Ferguson - North Carolina A&T State University**Dehua Feng - North Carolina A&T State University**Yang Gao - North Carolina A&T State University*

10:36AM

Performance Enhancement of Two Stages EHD Gas Pump in a Rectangular Channel With Uneven Voltages

Technical Paper Publication: IMECE2022-96022

A.K.M. Monayem H. Mazumder - Saginaw Valley State University

10:57AM

Dynamical Theory of Wall-Bounded Turbulent Flows

Technical Presentation: IMECE2022-98963

Taewoo Lee - Arizona State University

11:18AM

Revealing the Richtmyer-Meshkov Instability Within Gas Dynamic Detonations

Technical Paper Publication: IMECE2022-95224

*Yang Gao - North Carolina A&T State University**Dehua Feng - North Carolina A&T State University**Frederick Ferguson - North Carolina A&T State University*

11:39AM

Pipeline Leak Detection and Localization Based on Advanced Signal Processing and Negative Pressure Wave Analysis

Technical Paper Publication: IMECE2022-95048

Weiming Li - BlueOcean Services

10-3: Fundamental Issues and Perspectives in Fluid Mechanics

10-03-01: CFD Applications - I

1:30PM–3:15PM - CONVENTION CENTER, B230/B231

1:30PM

Numerical Analysis of Interfacial Electrohydrodynamic Flow With Modal Decomposition

Technical Paper Publication: IMECE2022-95100

*Sílvia Cândido - University of Beira Interior**José C. Páscoa - University of Beira Interior*

1:51PM

Numerical Investigation of Irrigant Flow Characteristics for Manual Endodontic Debridement

Technical Paper Publication: IMECE2022-95982

*Gregory Janes - Grand Valley State University**Tikran Kocharian - Grand Valley State University**Sanjivan Manoharan - Grand Valley State University*

2:12PM

Impact of the Blade Profiling on the Performance of Low-Pressure Axial Fans

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TECHNICAL SESSIONS

TUESDAY, NOVEMBER 1

Technical Paper Publication: IMECE2022-94280*Manuel Fritsche - Coburg University of Applied Sciences**Philipp Epple - Coburg University of Applied Sciences**Antonio Delgado - Friedrich-Alexander University Erlangen-Nürnberg***2:33PM****Impact of the Tip Clearance and the Inflow Nozzle Shape on the Performance of Low-Pressure Axial Fans****Technical Paper Publication: IMECE2022-95881***Manuel Fritsche - Coburg University of Applied Sciences**Philipp Epple - Coburg University of Applied Sciences**Antonio Delgado - Friedrich-Alexander University Erlangen-Nürnberg***2:54PM****Thermal Response of a Channel Flow With PCM-Filled Thermal Energy Storage Subjected to Varying Temperatures****Technical Presentation: IMECE2022-99489***Kamran Siddiqui - University of Western Ontario**Sameed Akber - University of Western Ontario**Christopher Degroot - University of Western Ontario***10-5: Fluid Engineering in Micro- and Nanosystems****10-05-01: Multiphase Flows****3:30PM–5:15PM - CONVENTION CENTER, B230/B231****3:30PM****Numerical Study of Erosion Wear on the Disc of a Butterfly Valve With Laminar Particle-Laden Flows in a Horizontal Pipeline****Technical Paper Publication: IMECE2022-94738***Orlando Ayala - Old Dominion University**Orlando F. Ayala - Universidad de Oriente**Ricardo Villalba - Universidad de Oriente***3:51PM****Analysis and Management of Thermal Energy Release During Quench in a Superconducting Magnet****Technical Paper Publication: IMECE2022-95762***Nusair Hasan - Michigan State University**Venkatarao Ganni - Michigan State University**Peter Knudsen - Michigan State University***4:12PM****Benchmarking a Multi-Phase Fluid Model of a Slosh Mitigation Device in Microgravity Utilizing Parabolic Flight Test Data****Technical Presentation: IMECE2022-99385***Vijay Vishal Duraisamy - Embry-Riddle Aeronautical University**Pedro Llanos - Embry-Riddle Aeronautical University**Birce Dikici - Embry-Riddle Aeronautical University**Sathya Gangadharan - Embry-Riddle Aeronautical University***4:33PM****Separating Oil-Water Mixtures Using Bump Arrays****Technical Paper Publication: IMECE2022-95920***Judith Bamberger - Pacific Northwest National Laboratory**Leonard Pease - Pacific Northwest National Laboratory**Carolyn Burns - Pacific Northwest National Laboratory**Michael Minette - Pacific Northwest National Laboratory***4:54PM****Computational Protocol for Simulations of Spray Flows Including Primary Atomization****Technical Presentation: IMECE2022-98995***Taewoo Lee - Arizona State University**J.E. Park - Arizona State University***IMECE**[®]**ONE GREAT LEARNING EXPERIENCE.**
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TECHNICAL SESSIONS

WEDNESDAY, NOVEMBER 2

WEDNESDAY, NOVEMBER 2

10-3: Fundamental Issues and Perspectives in Fluid Mechanics**10-03-02: CFD Applications - II****10:45AM–12:30PM - CONVENTION CENTER, B230/B231****10:45AM****Pareto-Based Optimization of a Gas Turbine Combustor Design****Technical Presentation: IMECE2022-95465***Jennifer Miklaszewski - University of Colorado Boulder**Masha Folk - Rolls-Royce Corporation**Peter Hamlington - University of Colorado Boulder***11:06AM****Simulating Aerodynamic Effects of Location and Orientation of Bicycles Mounted on Sedans****Technical Paper Publication: IMECE2022-94997***Sarah Goodrich - Rochester Institute of Technology**Isaac Perez-Raya - Rochester Institute of Technology***11:27AM****Simulation for Optimization of a Filter Cake System****Technical Paper Publication: IMECE2022-95717***Alyssa Johnson - McNeese State University**Allison Lebleu - McNeese State University**Ning Zhang - McNeese State University***11:48AM****Aerodynamic Analysis of a Car Based on Computational Fluid Dynamics and Machine Learning****Technical Paper Publication: IMECE2022-96817***Xingchuan Ma - Portsmouth Abbey School***12:09PM****Aerosol Dispersion Modeling With a Low-Cost Flow Simulation Tool: Analysis of Performance and Boundary Condition Sensitivity****Technical Paper Publication: IMECE2022-95997***Mallory Hirn - United States Military Academy**Andrew Rodriguez - United States Military Academy**Mark Owkes - Montana State University**Philip Dacunto - United States Military Academy**Andrew Ng - United States Military Academy**John Rogers - United States Military Academy**Michael Benson - United States Military Academy***10-6: Flow and Thermal Processes in Internal Multiphase Flows****10-06-01: Industrial Flows - I****2:00PM–3:45PM - CONVENTION CENTER, B230/B231****2:00PM****The Effect of Buoyancy-Driven Convection in Vacuum Membrane Distillation Module****Technical Paper Publication: IMECE2022-95143***Justin Caspar - Lehigh University**Guanyang Xue - Lehigh University**Jaber Asiri - Lehigh University**Alparslan Oztekin - Lehigh University*

TECHNICAL SESSIONS

WEDNESDAY, NOVEMBER 2

2:21PM**Filament Extension Atomization Spraying of High Concentration Whey Suspensions****Technical Paper Publication: IMECE2022-97022**

Aditya Sangli - Palo Alto Research Center
Austin Hultmark - Palo Alto Research Center
Graham Aldinger - Palo Alto Research Center
Ranjeet Rao - Palo Alto Research Center
David Johnson - Palo Alto Research Center
Ashutos Parhi - Utah State University
Prateek Sharma - Utah State University

2:42PM**Enhancement of Flow Mixing Using a Two-Stage EHD Gas Pump With Angled Electrode Configuration****Technical Paper Publication: IMECE2022-96910**

S.C. Lin - National Taiwan University of Science and Technology
B.L. Huang - National Taiwan University of Science and Technology
S.H. Liou - National Taiwan University of Science and Technology
Feng C. Lai - University of Oklahoma

3:03PM**Multiphase Flow and Heat Transfer in an Electric Motor****Technical Paper Publication: IMECE2022-96801**

Ashutosh Pandey - Simerics, Inc.
Bharath Madduri - Ford Motor Company
Chin-Yuan Perng - Ford Motor Company
Chiranth Srinivasan - Simerics, Inc.
Sujan Dhar - Simerics, Inc.

3:24PM**Experimental Results for Large Particle Separation From Non-Newtonian Slurries Using Tapered Bump Arrays****Technical Paper Publication: IMECE2022-94469**

Judith Bamberger - Pacific Northwest National Laboratory
Leonard Pease - Pacific Northwest National Laboratory
Jason Serkowski - Pacific Northwest National Laboratory
Michael Minette - Pacific Northwest National Laboratory
Carolyn Burns - Pacific Northwest National Laboratory

10-7: Recent Developments in Multiphase Flow**10-07-01: Fluids Measurements****4:00PM–5:45PM - CONVENTION CENTER, A225****4:00PM****Experimental Characterization of Surge Cycles in a Centrifugal Compressor****Technical Paper Publication: IMECE2022-94747**

Alberto Serena - Norwegian University of Science and Technology
Lars Eirik Bakken - Norwegian University of Science and Technology

4:21PM**Proper Orthogonal Decomposition Analysis of Particle Image Velocimetry Data at the Inlet of a Centrifugal Compressor****Technical Paper Publication: IMECE2022-94308**

Deb Banerjee - The Ohio State University
Ahmet Selamet - The Ohio State University
Rick Dehner - The Ohio State University

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TECHNICAL SESSIONS

WEDNESDAY, NOVEMBER 2

4:42PM

Unsteady Dynamics of a Low Aspect Ratio Mixing Layer**Technical Paper Publication: IMECE2022-94876***Adam Eckstein - United States Military Academy**Andrew Banko - United States Military Academy**Michael Benson - United States Military Academy*

5:03PM

Investigation of Particle Velocity and Drag With Spherical and Non-Spherical Particles Through a Backward Facing Step**Technical Paper Publication: IMECE2022-95749***Kyle Larsen - Eastern Washington University**Hessam Gharavi - Eastern Washington University**Robert Gerlick - Eastern Washington University**Heechang Bae - Eastern Washington University*

5:24PM

An Experimental Investigation on the Stability of Gel-Like Carbon Dot Based Nanofluids**Technical Paper Publication: IMECE2022-96376***Rahat Mollick - The University of Iowa**Nicholas Hentges - The University of Iowa**A.S.M. Sazzad Parveg - The University of Iowa**Yiqun Zhou - University of Miami**Roger M. Leblanc - University of Miami**Albert Ratner - The University of Iowa***THURSDAY, NOVEMBER 3**

Track 10: Fluids Engineering

Tuesday, November 1, 9:15AM-10:00AM

Room: B230/B231

Greater Columbus Convention Center

Title: The Convergence of Exascale Computing and Data Science Toward Zero-carbon Fuels for Power & Transportation*Jacqueline Chen**Sandia National Laboratories***10-4: CFD Applications for Optimization and Controls****10-04-01: Fluid Engineering in Micro- and Nano-Systems****10:15AM–12:00PM - CONVENTION CENTER, A220**

10:15AM

Jet Formation After Droplet Impact on Microholed Hydrophilic Surfaces**Technical Paper Publication: IMECE2022-95146***Md. Nur Alam - Washington State University**Hua Tan - Washington State University Vancouver*

10:36AM

Circulating Tumor Cell Separation in a Zigzag Channel Using Dielectrophoresis Based Inertial Microfluidics**Technical Paper Publication: IMECE2022-95384***Md. Sadiql Islam - Washington State University Vancouver**Mohammed Raihan Uddin - Washington State University Vancouver**Xiaolin Chen - Washington State University Vancouver*

10:57AM

Electrokinetics-Driven Transport of Charged Nanoparticles Through Micro and Nanochannels**IMECE**[®]**ONE GREAT LEARNING EXPERIENCE.**
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TECHNICAL SESSIONS

WEDNESDAY, NOVEMBER 2

Technical Presentation: IMECE2022-99799

Siamak Mirfendereski - University of Nebraska-Lincoln
Justin Brooks - University of Nebraska-Lincoln
Jae Sung Park - University of Nebraska-Lincoln
Ruiguo Yang - University of Nebraska-Lincoln

11:18AM**Concave Bending of Contact Line of a Sessile Water Droplet Due to Molecular Polarization and Surface Trapping****Technical Paper Publication: IMECE2022-92232**

Lei Zhao - Virginia Tech
Yang Li - Virginia Tech
Jiangtao Cheng - Virginia Tech

11:39AM**Droplet Impact on an Obliquely Approaching Smooth and Rough Flat Substrates****Technical Paper Publication: IMECE2022-96838**

Ahmed Islam - University of Louisville
Sumit Paul - University of Louisville

10-6: Flow and Thermal Processes in Internal Multiphase Flows**10-06-02: Industrial Flows - II****10:15AM–12:00PM - CONVENTION CENTER, A221****10:15AM****Application of Wray-Agarwal One-Equation Turbulence Model to Industrial Flows With Large Curvature****Invited Presentation: IMECE2022-94484**

Ramesh Agarwal - Washington University

10:36AM**Design a Low Specific Speed Dry Pit Solids Handling Pump With Pure 3-D Computational Fluid Dynamics Virtual Testing****Technical Paper Publication: IMECE2022-94551**

Azfar Ali - Flowserve Corp.
Zhuoyu Zhou - Simerics, Inc.

10:57AM**A Computational Analysis of the Aerodynamic Effects on Particles Flowing From a Duct****Technical Paper Publication: IMECE2022-96748**

Cairen Miranda - Virginia Tech
John Palmore - Virginia Tech

11:18AM**Overview of ASME V&V 20-2009 Standard for Verification and Validation in Computational Fluid Dynamics and Heat Transfer****Technical Presentation: IMECE2022-100073**

Kevin Dowding - Sandia National Laboratories

11:39AM**Numerical Study and Validation of Hot Metal Desulfurization Using Calcium Carbide in the Ladle****Technical Paper Publication: IMECE2022-93971**

Xipeng Guo - Purdue University Northwest
Congshan Mao - Purdue University Northwest
Nicholas Walla - Purdue University Northwest
Armin Silaen - Purdue University Northwest
Chenn Zhou - Purdue University Northwest

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TECHNICAL SESSIONS

WEDNESDAY, NOVEMBER 2

10-1: Electric, Magnetic and Thermal Phenomena in Micro and Nano-Scale Systems**10-01-01: Micro and Nano-Scale Phenomena in Nonlinear Materials and Complex Fluids**

2:00PM–3:45PM - CONVENTION CENTER, A220

2:00PM

Staticapronics: Targeted Electrostatic Deposition of Water and Nutrients on Plant Roots for Space Missions

Technical Presentation: IMECE2022-99537

Rahman Pejman - Rutgers University
Sriya Bapatla - Rutgers University
Khyathi Dadi - Rutgers University
Bryan Llumiquinga - Rutgers University
David Specca - Rutgers University
Arend-Jan Both - Rutgers University
Jonathan P. Singer - Rutgers University

2:21PM

Electric Field-Driven Structuring in Polarized Colloids

Technical Presentation: IMECE2022-94370

Boris Khusid - New Jersey Institute of Technology
Qian Lei - New Jersey Institute of Technology

2:42PM

Comparison of the Heating Effect of Rod-Like Particles in an Alternating and a Rotating Magnetic Field

Technical Presentation: IMECE2022-99174

Seiya Suzuki - Akita Prefectural University
Akira Satoh - Akita Prefectural University
Muneo Futamura - Akita Prefectural University

3:03PM

Non-Newtonian Fluid Apparent Viscosity Correlation Between Experimental Data and Computational Fluid Dynamics Results: A Case Study From Automatic Transmission Fluid Filtration Industry

Technical Paper Publication: IMECE2022-96025

Patrik Kehler - Universidad Nacional de Asunción
Nicolas Arenas - Universidad Nacional de Asunción
Ferdinand Meixner - Universidad Nacional de Asunción
Jovan Toews - Universidad Nacional de Asunción
Liz Esquivel - Universidad Nacional de Asunción
Vivian Gonzalez - Universidad Nacional de Asunción
Renato Benzo - Universidad Nacional de Asunción
Jorge Kurita - Universidad Nacional de Asunción

3:24PM

Heat Transfer During Polymer Selective Laser Sintering Process: Parametric Analysis

Technical Paper Publication: IMECE2022-96664

Lan Zhang - Institut National des Sciences Appliquées de Lyon
M'hamed Boutaous - Centre d'Énergétique et de Thermique de Lyon
Shihe Xin - Institut National des Sciences Appliquées de Lyon
Dennis A. Siginer - Centro de Investigación en Creatividad y Educación Superior

10-3: Fundamental Issues and Perspectives in Fluid Mechanics**10-03-03: CFD Applications - III**

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TECHNICAL SESSIONS

WEDNESDAY, NOVEMBER 2

2:00PM–3:45PM - CONVENTION CENTER, A221

2:00PM

Numerical Investigation on Aerodynamic Performance of a Racing Car by Drag Reduction**Technical Paper Publication: IMECE2022-94495***Mahedi Hassan - Bangladesh University of Engineering and Technology**Mahmudul Hassan - Bangladesh University of Engineering and Technology**Mohammad Ali - Bangladesh University of Engineering and Technology**M. Ruhul Amin - Montana State University*

2:21PM

Electrical Characteristics of the Oxyfuel Preheat Flame: 3-D Computational Model Subject to Electric Bias Voltages**Technical Paper Publication: IMECE2022-95787***S.M. Mahbobur Rahman - Virginia Polytechnic Institute and State University**Rohith Warriar - Virginia Polytechnic Institute and State University**Alexandrina Untaroiu - Virginia Polytechnic Institute and State University**Christopher R. Martin - Penn State Altoona*

2:42PM

Multiscale Modeling of the Uptake of Hydrogen Chloride on Anodized Aluminum With Relevance to Spacecraft Fire Safety**Technical Paper Publication: IMECE2022-95243***Justin Niehaus - NASA Glenn Research Center**Sandip Mazumder - The Ohio State University*

3:03PM

Fume Flow Analysis Generated From Landfill Fire: A Case Study**Technical Paper Publication: IMECE2022-96178***Vivian Gonzalez - Universidad Nacional de Asunción**Liz Esquivel - Universidad Nacional de Asunción**Elías Espínola - Universidad Nacional de Asunción**Abdías García - Universidad Nacional de Asunción**Víctor Burgos - Universidad Nacional de Asunción**Fabio Coronel - Universidad Nacional de Asunción**Francisco Gómez - Universidad Nacional de Asunción**Pedro Cañete - Universidad Nacional de Asunción**Luis Gusto - Universidad Nacional de Asunción**Juan Vazquez - Universidad Nacional de Caaguazu**Diego Gonzalez - Universidad Nacional de Asunción**Rossana Villalba - Universidad Nacional de Asunción**Jorge Kurita - Universidad Nacional de Asunción*

3:24PM

Understanding the Impact of the Rim Protector on the Aerodynamic Performance of a Standalone Tire**Technical Paper Publication: IMECE2022-96007***Shubham Rath - Virginia Tech**Alexandrina Untaroiu - Virginia Tech**Gen Fu - Virginia Tech*

TECHNICAL SESSIONS

WEDNESDAY, NOVEMBER 2

10-8: Multiphase Flow with Bio-Applications**10-08-01: Fluid Engineering Applications****4:00PM–5:45PM - CONVENTION CENTER, A220****4:00PM**

Experimental Investigation of Taper Angle and Airflow Rate on Air-Injected Bubble Squeezing in a Tapered Microgap

Technical Paper Publication: IMECE2022-97020
Maharshi Shukla - Rochester Institute of Technology
Satish Kandlikar - Rochester Institute of Technology

4:21PM

Examining the Hydration Behavior of Aqueous Calcium Chloride (CaCl₂) Solution

Technical Presentation: IMECE2022-99055
Lida Yan - Lehigh University
Ganesh Balasubramanian - Lehigh University

4:42PM

Geometrical Modulation of Streaming Potential Over Slippery Liquid-Filled Surfaces

Technical Presentation: IMECE2022-100202
Bei Fan - Michigan State University
Prabhakar Bandaru - University of California, San Diego

5:03PM

Designing a Physical Model for the Emsworth Lock and Dam Filling and Emptying System

Technical Paper Publication: IMECE2022-95481
Nathan Doshi - United States Military Academy
Jacob Hancox - United States Military Academy
Polakrit Karkhai - United States Military Academy
Cameryn Smith - United States Military Academy

Adam Tawakkol - United States Military Academy
Spencer White - United States Military Academy
Elizabeth Bristow - United States Military Academy
Aaron Hill - United States Military Academy
Brad McCoy - United States Military Academy
Margaret Nowicki - United States Military Academy

10-9: Industrial Flows**10-09-01: Young Engineers Paper Contest****4:00PM–5:45PM - CONVENTION CENTER, A221****4:00PM**

Dynamics of Laminar-to-Turbulent Transition in a Wall-Bounded Channel Flow up to $Re = 40,000$

Technical Paper Publication: IMECE2022-94489
Mohsin Al Barwani - University of Nebraska-Lincoln
Jae Sung Park - University of Nebraska-Lincoln

4:21PM

Designing a Particle Flow Control Apparatus

Technical Paper Publication: IMECE2022-94820
Sheharyar Malik - The University of Tulsa
Keldon Anderson - The University of Tulsa
Nipun Goel - Western Washington University
Todd Otanicar - Boise State University
Soroor Karimi - The University of Tulsa

4:42PM

Designing a Whirling Arm for Water Droplet Erosion Testing Apparatus

Technical Paper Publication: IMECE2022-95131
Julia Behlmann - The University of Tulsa
Keldon Anderson - The University of Tulsa
Soroor Karimi - The University of Tulsa



TECHNICAL SESSIONS

Track 11: Heat Transfer and Thermal Engineering- Sponsored by the Heat Transfer Division

Topics:

- 11-1: Heat and Mass Transfer in Heating, Cooling, and Power Systems
- 11-2: Heat Transfer Engineering Leveraging Additive Manufacturing and Topology Optimization
- 11-3: Heat Transfer in Batteries and Energy Storage Technologies
- 11-4: Nanoscale Measurements of Thermophysical Properties
- 11-5: Techniques Development for Thermophysical Characterization
- 11-6: Thermophysical Properties of Micro/nanoscale Materials
- 11-7: Thermophysical Properties Modeling and Prediction
- 11-8: Fundamentals of Phase-Change Including Micro/Nanoscale Effects-Boiling, Evaporation, Freezing and Condensation
- 11-9: Fundamentals of Single Phase Convection
- 11-10: Fundamentals of Radiative Transport and Conduction Including Micro/Nanoscale Effects
- 11-11: Machine Learning in Nanoscale Thermal Transport
- 11-12: Thermal Transport in Low-Dimensional Materials
- 11-13: First-Principles Calculations in Thermal Transport in Solids
- 11-14: Molecular Dynamics Simulation of Thermal Transport in Nanostructures or Across Interface
- 11-15: Ultra-Low and Ultra-High Thermal Conductivity Materials
- 11-16: Nanoscale Phase Change Heat Transfer
- 11-17: Radiative Properties of Nanostructures
- 11-18: Nanoscale Radiative Thermal Devices/Systems
- 11-19: Tunable Nanoscale Heat Transfer
- 11-20: Single-phase Enhanced Heat Transfer Equipment
- 11-21: Multi-Scale Multi-Phase Heat Transfer Equipment
- 11-22: Additive Manufacturing of Heat Transfer Equipment
- 11-23: Application of Advanced Materials and Coatings for Heat Transfer Equipment
- 11-24: High-Temperature Heat Transfer Equipment
- 11-25: Heat Transfer Equipment Nemesis: Frost, Fouling, Corrosion, condensate Build-up
- 11-26: CMS - Emissions Reduction Technologies and Decarbonization
- 11-27: CMS - Industrial and Applied Combustion Systems
- 11-28: CMS - Fundamental Processes - Laminar and Turbulent Reacting Flows
- 11-29: Aerospace Heat Transfer
- 11-30: Convective Boiling and Condensation
- 11-31: Heat Pipes
- 11-32: Heat Transfer in Particle-Laden Flows
- 11-33: Gas Turbine Heat Transfer
- 11-34: Transport Phenomena in Manufacturing and Materials Processing
- 11-35: Processing of Frontier Materials
- 11-36: Transport Phenomena in Additive Manufacturing
- 11-37: Processing of Battery Materials
- 11-38: Heat Transfer in Electronic Equipment
- 11-39: Heat Transfer under Extreme Conditions
- 11-40: Heat and Mass Transfer in Biomass Energy Utilization Systems
- 11-41: Heat and Mass Transfer for Natural Disasters/Climate Change
- 11-42: Heat and Mass Transfer for Natural and Built Environments
- 11-43: Bio/Nature-Inspired Heat and Mass Transfer
- 11-44: Heat and Mass Transfer for Renewable Energy Conversion Processes
- 11-45: Applications of Computational Heat Transfer
- 11-46: Methods and Algorithms in Computational Heat Transfer
- 11-47: Computational Methods for Materials Development and Manufacturing
- 11-48: Application of Machine Learning/Artificial Intelligence in Heat Transfer



TECHNICAL SESSIONS

- 11-49: Application of Computational Heat Transfer for Indoor Environmental Quality
 11-50: Inverse Problems in Computational Heat Transfer
 11-51: Application of Computational Heat Transfer for Energy Systems
 11-52: Computational Thermal/Fluids
 11-53: Visualization

ACKNOWLEDGMENT TRACK ORGANIZERS

Track Organizer: Brent Webb

Track Co-Organizer: Amanie Abdelmessih

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 Xinwei Wang, Iowa State University
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 Zheng, Yi, Northeastern University
 Zhuomin Zhang, Georgia Institute of Technology

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 Amitabh Narain - Michigan Technological University
 An Zou - Syracuse University
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 Zhuomin Zhang - Georgia Institute of Technology



TECHNICAL SESSIONS

MONDAY, OCTOBER 31

TRACK 11

MONDAY, OCTOBER 31

Track 11: Heat Transfer and Thermal Engineering

Monday, October 31, 9:45AM-10:30AM

Room: A212/A213

Greater Columbus Convention Center

Title: Radiation Environment in Space and Shielding Materials

Yildiz Bayazitoglu
Rice University

11-1: Heat and Mass Transfer in Heating, Cooling, and Power Systems

11-01-01: Heat and Mass Transfer in Heating, Cooling, and Power Systems

10:45AM -12:30PM - CONVENTION CENTER, B230/B231

10:45AM

Design of a Miniature HVAC System to Function as a Multipurpose Cooling Shirt

Technical Paper Publication: IMECE2022-94091

Jess Gale - Georgia Southern University
Sevki Cesmeci - Georgia Southern University

11:06AM

Estimating Combined Impact of Urban Heat Island Effect and Climate Change on Cooling Requirements of Tall Residential Buildings in Hot-Humid Locations

Technical Paper Publication: IMECE2022-94272

Athar Kamal - Texas A&M University at Qatar
Ibrahim Hassan - Texas A&M University at Qatar
Liangzhu Wang - Concordia University
Mohammad Azizur Rahman - Texas A&M University at Qatar

11:27AM

The Difference Between Still and Rotational Motion of Complex Shape Chicken Carcasses

Technical Paper Publication: IMECE2022-95171

Aklilu G. Giorges - Georgia Tech
Comas Haynes - Georgia Tech Research Institute
Vinh Dong - Georgia Tech
Sean Thomas - Georgia Tech

11:48AM

Extended Analysis of Micro Fin Array Configurations for Single- and Two-Phase Flow

Technical Paper Publication: IMECE2022-95984

Colton Frear - Florida Polytechnic University
Gerardo Carbajal - Florida Polytechnic University
Edwar Romero-Ramirez - Florida Polytechnic University

11-44: Heat and Mass Transfer for Renewable Energy Conversion Processes

11-44-01: Heat and Mass Transfer for Renewable Energy Conversion Processes

10:45AM–12:30PM - CONVENTION CENTER, A224

10:45AM

Entropy Generation Analysis on a Thermoelectric Generator in an Exhaust Automotive Line With Porous Media

Technical Paper Publication: IMECE2022-94797

Bernardo Buonomo - Università degli Studi della Campania "Luigi Vanvitelli"
Anna Di Pasqua - Università degli Studi della Campania "Luigi Vanvitelli"
Oronzio Manca - Università degli Studi della Campania "Luigi Vanvitelli"
Sergio Nappo - Università degli Studi della Campania "Luigi Vanvitelli"



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TECHNICAL SESSIONS

MONDAY, OCTOBER 31

11:06AM**Heat Transfer in Liquid Nitrogen Cooled Superconducting Transformers: An Experimental Investigation****Technical Paper Publication: IMECE2022-94832***Sean Orchuk - University of Toronto**Sanjeev Chandra - University of Toronto***11:27AM****Numerical Study of Inclination Effect on a Flat-Plate Direct Absorption With Water-Nanofluid Mixtures in Summer and Winter Conditions****Technical Paper Publication: IMECE2022-94938***Bernardo Buonomo - Università degli Studi della Campania "Luigi Vanvitelli"**Fabio Cardillo - Università degli Studi della Campania "Luigi Vanvitelli"**Pietro Chirico - Università degli Studi della Campania "Luigi Vanvitelli"**Oronzio Manca - Università degli Studi della Campania "Luigi Vanvitelli"**Sergio Nardini - Università degli Studi della Campania "Luigi Vanvitelli"**Giovanna Russo - Università degli Studi della Campania "Luigi Vanvitelli"**Angela Scapatucci - Università degli Studi della Campania "Luigi Vanvitelli"**Ivan Vicidomini - Università degli Studi della Campania "Luigi Vanvitelli"***11:48AM****Latent Heat Thermal Energy Storage in Shell and Tube With PCM and Metal Foam in LTNE With External Heat Losses****Technical Paper Publication: IMECE2022-95703***Bernardo Buonomo - Università degli studi della Campania "Luigi Vanvitelli"**Maria Rita Golia - Università degli studi della Campania "Luigi Vanvitelli"**Oronzio Manca - Università degli studi della Campania "Luigi Vanvitelli"**Sergio Nardini - Università degli studi della Campania "Luigi Vanvitelli"**Renato Elpidio Plomitallo - Università degli studi della Campania "Luigi Vanvitelli"***11-52: Computational Thermal/Fluids****11-52-01: Computational Thermal/Fluids****10:45AM–12:30PM - CONVENTION CENTER, A225****10:45AM****The Optimal Geometric Arrangement of Heat Pipes in Computer CPU Coolers****Technical Paper Publication: IMECE2022-91488***Shuva Das - Southern Illinois University Edwardsville**Majid Molki - Southern Illinois University Edwardsville***11:06AM****The Analysis of Interaction Between Reflected Shock Wave and Boundary Layers in a Shock Tube****Technical Paper Publication: IMECE2022-94742***Abdulmumin Olaoke - Southern Illinois University, Edwardsville**Majid Moliki - Southern Illinois University, Edwardsville***11:27AM****A Domain Specific Language Applied to Phonon Boltzmann Transport for Heat Conduction****Technical Paper Publication: IMECE2022-95034***Eric Heisler - The University of Utah**Siddharth Saurav - The Ohio State University**Aadesh Deshmukh - The University of Utah**Sandip Mazumder - The Ohio State University**Ponnuswamy Sadayappan - The University of Utah**Hari Sundar - The University of Utah***IMECE**[®]**ONE GREAT LEARNING EXPERIENCE.**
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TECHNICAL SESSIONS

MONDAY, OCTOBER 31

11:48AM**Integration of CFD - CHT Analyses to Develop Harley-Davidson Motorcycles****Technical Paper Publication: IMECE2022-95108***Alka Gupta - Harley-Davidson Motor Company**Mojtaba Rajaei - Harley-Davidson Motor Company***12:09PM****Overview of ASME V&V 20-2009, Standard for Verification and Validation in Computational Fluid Dynamics and Heat Transfer****Technical Presentation: IMECE2022-100117***Kevin Dowding - Sandia National Laboratories***11-1: Heat and Mass Transfer in Heating, Cooling, and Power Systems****11-01-02: Heat and Mass Transfer in Heating, Cooling, and Power Systems****2:00PM–3:45PM - CONVENTION CENTER, B230/B231****2:00 PM****Energy and Consumption Fuel Study for a Mobile Air Conditioning System Using Ejector and R445a as Replacement Alternative for R134a****Technical Paper Publication: IMECE2022-96223***Dario Méndez Méndez - Universidad de Guanajuato**Vicente Pérez García - Universidad de Guanajuato**Angel Isaac Solorio Alvarado - Universidad de Guanajuato**Juan Manuel Belman Flores - Universidad de Guanajuato**José De Jesus Ramírez Minguela - Universidad de Guanajuato***2:21PM****Investigation of Mass Savings Potential of Zeolite Integrated Motor Thermal Management Systems in All-Electric Commercial Aircraft****Technical Paper Publication: IMECE2022-96671***Nathan Malone - Texas A&M University**Sourav Chakravarty - Texas A&M University**Shiyu Zhang - Texas A&M University**Dorsa Talebi - Texas A&M University**Sri Vignesh Sankarraman - The University of Texas at Dallas**Erick Pool - Texas A&M University**Deokgeun Park - Texas A&M University**Ethan Iverson - Texas A&M University**Chase Wiley - Texas A&M University**Patrick Shamberger - Texas A&M University**Dion Antao - Texas A&M University**Matthew Gardner - The University of Texas at Dallas**Hamid Toliyat - Texas A&M University**Prasad Enjeti - Texas A&M University**Bryan Rasmussen - Texas A&M University**Jaime Grunlan - Texas A&M University**Moble Benedict - Texas A&M University**Jonathan Felts - Texas A&M University***2:42PM****Study of Flow Configuration and Heat Pipe Combination Effects in Air Cooling Systems****Technical Paper Publication: IMECE2022-97105***Gerardo Carbajal - Florida Polytechnic University***3:03PM****Investigation of Passive Radiative Cooling Using Biopolymers****Technical Presentation: IMECE2022-98470***Zahra Kamali Khanghah - University of Nebraska-Lincoln**Mohammad Ghashami - University of Nebraska-Lincoln***3:24PM****Architected Porous Structures With Tailored Thermal, Mechanical, and Fluid Properties****IMECE**[®]**ONE GREAT LEARNING EXPERIENCE.**
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TECHNICAL SESSIONS

MONDAY, OCTOBER 31

Technical Presentation: IMECE2022-99847

Silven Stallard - The University of Kansas
Huan Jiang - University of Louisville
Yanyu Chen - University of Louisville
Xianglin Li - The University of Kansas

11-45: Applications of Computational Heat Transfer**11-45-01: Applications of Computational Heat Transfer****2:00PM–3:45PM - CONVENTION CENTER, A224****2:00PM****Heat Transfer and Flow Characteristic of Sinusoidal Wavy Microchannel Heat Sink With Different Phase Shift****Technical Paper Publication: IMECE2022-95864**

Abdul Aziz Shuvo - Bangladesh University of Engineering and Technology
Md. Omarsany Bappy - Bangladesh University of Engineering and Technology
Amitav Tikadar - Georgia Institute of Technology
Titan Paul - University of South Carolina Aiken
Akm M. Morshed - Bangladesh University of Engineering and Technology

2:21PM**Pressure and Shear Driven Flow in Micro- and Minichannels****Technical Presentation: IMECE2022-99037**

Yogesh Jaluria - Rutgers University

2:42PM**Vapour Cough Visualization for Covid-19 - Computational Modelling Approach****Technical Paper Publication: IMECE2022-94143**

Mohammad Al-Rawi - Waikato Institute of Technology
Ahmed Al-Jumaily - Auckland University of Technology

3:03PM**Effects of Highly Anisotropic Non-Homogeneous Turbulence on Circular Cylinder Heat and Fluid Flow****Technical Paper Publication: IMECE2022-94566**

Mohamed Abdelhady - National Research Council Canada
David H. Wood - University of Calgary

3:24PM**Three-Dimensional Computational Modeling of Forced Convection in Slotted Wavy Fin Cores****Technical Presentation: IMECE2022-99760**

Shubham J. Sathe - University of Cincinnati
Milind A. Jog - University of Cincinnati
Raj M. Manglik - University of Cincinnati

11-46: Methods and Algorithms in Computational Heat Transfer**11-46-01: Methods and Algorithms in Computational Heat Transfer****2:00PM–3:45PM - CONVENTION CENTER, A225****2:00PM****Fully Coupled Thermal-Fluidic-Structural Topology Optimization of Conformal Fluid Channels for Thermal Management of Structures****Technical Presentation: IMECE2022-99833**

Heting Fu - University of Michigan
Kazuhiro Saitou - University of Michigan
Deng Hao - University of Michigan

2:21PM**A Reduced Three-Phase Model for Solidification of Liquid in Large Tanks**

TECHNICAL SESSIONS

MONDAY, OCTOBER 31

Technical Paper Publication: IMECE2022-95217

Shashank Terala - The Ohio State University
Sandip Mazumder - The Ohio State University
Gurpreet Matharu - Ford Motor Company
Dhaval Vaishnav - Ford Motor Company
Syed Ali - Ford Motor Company

2:42PM

Numerical Methods for Heat Transfer Computations of Curved Cross Sections Using Simple Excel Techniques

Technical Paper Publication: IMECE2022-95316

Amanie Abdelmessih - California Baptist University

3:03PM

Investigation of Thermal Stresses in Glass During Manufacture

Technical Presentation: IMECE2022-95742

Enayat Mahajerin - Saginaw Valley State University

3:24PM

Two-Temperature Time-Fractional Model for Electron-Phonon Coupled Interfacial Thermal Transport

Technical Presentation: IMECE2022-99808

Milad Mozafarifard - University of Nevada, Reno
Yan Wang - University of Nevada, Reno

11-03-01: Heat Transfer in Batteries and Energy Storage Technologies**4:00PM–5:45PM - CONVENTION CENTER, A223****4:00PM**

Suppressing Subcooling in an Inorganic Phase Change Material Based Thermal Energy Storage System Using Self-Seeding Technique

Technical Presentation: IMECE2022-95246

Sarath Kannan - University of Cincinnati
Milind Jog - University of Cincinnati
Raj Manglik - University of Cincinnati

4:21PM

Numerical Investigation on the Suitability of a PCM/Refrigerant Hybrid Cooling System for Lithium-Ion Batteries

Technical Paper Publication: IMECE2022-96031

Jesse Kittleson - California State University, Northridge
Abhijit Mukherjee - California State University, Northridge

4:42PM

Comparison of Fire Suppression Techniques on Lithium-Ion Battery Pack Fires

Technical Presentation: IMECE2022-96973

Wei Tang - National Institute for Occupational Safety and Health

5:03PM

Cfd and Experimental Investigation of Graphite Heat Spreader Based Cooling for Li-Ion Batteries for Electric Vehicles (EVS) and EVTOL (Electric Vertical Take-Off and Landing) Aircraft Applications

Technical Paper Publication: IMECE2022-97123

Shashwat Bakhshi - Romeo Power
Prahit Dubey - Romeo Power Technology

11-48-01: Application of Machine Learning/Artificial Intelligence in Heat Transfer**4:00PM–5:45PM - CONVENTION CENTER, A224****4:00PM**

Machine-Learning Approach to Modeling Oxidation of Toluene in a Bubble Column Reactor



TECHNICAL SESSIONS

MONDAY, OCTOBER 31

Technical Paper Publication: IMECE2022-94564*Raihan Tayeb - University of Missouri**Yuwen Zhang - University of Missouri***4:21PM**

Deploying Machine Learning (ML) for Improving Reliability and Resiliency of Thermal Energy Storage (TES) Platforms by Leveraging Phase Change Materials (PCM) for Sustainability Applications and Mitigating Food-Energy-Water (FEW) Nexus

Technical Paper Publication: IMECE2022-97121*Pinjala Sai Sudhir - Texas A&M University**Gangchen Ren - Texas A&M University**Aditya Chuttar - Texas A&M University**Nandan Shettigar - Texas A&M University**Debjyoti Banerjee - Texas A&M University***4:42PM**

A Comparison of Metaheuristic Optimization Techniques for One Dimensional TPV Gratings

Technical Presentation: IMECE2022-99349*Preston Bohm - Georgia Institute of Technology**Chiyu Yang - Georgia Institute of Technology**Zhoumin Zhang - Georgia Institute of Technology***5:03PM**

Smart Process Mapping of Additively-Manufactured Wicks Using Classification Models

Technical Presentation IMECE2022-99877*Mohammad Borumand - Wichita State University**Sima Esfandiarpour Borujeni - Wichita State University**Saideep Nannapaneni - Wichita State University**Moriah Ausherman - Wichita State University**Guru Madiraddy - University of Nebraska-Lincoln**Michael Sealy - Purdue University**Gisuk Hwang - Wichita State University*

11-02-01: Heat Transfer Engineering Leveraging Additive Manufacturing and Topology Optimization

4:00PM–5:45PM - CONVENTION CENTER, A225**4:00PM**

Growth Based Design of a Conducting Solid Cooled by Conjugate Gas Conduction and Surface Radiation

Technical Paper Publication: IMECE2022-95178*Chadwick Severt - The University of Kansas**Theodore Bergman - The University of Kansas***4:21PM**

Heat Transfer Characteristics of Particle Flow Through Additively Manufactured (SS316) Lattice Frame Material Based on Octet-Shape Topology

Technical Paper Publication: IMECE2022-95962*Youssef Aider - Mississippi State University**Ashreet Mishra - Mississippi State University**Like Li - Mississippi State University**Heejin Cho - Mississippi State University**Prashant Singh - Mississippi State University***4:42PM**

Expanding Material Selections for Additively Manufactured Cooling Designs

Technical Presentation: IMECE2022-99728*Thomas Corbett - The Pennsylvania State University**Karen Thole - The Pennsylvania State University***5:03PM**

Manufacturing Quality of Engine Scale Additively Manufactured Film Cooling Holes

Technical Presentation: IMECE2022-99746*Emma Veley - The Pennsylvania State University**Karen Thole - The Pennsylvania State University**David Bogard - The University of Texas*

TECHNICAL SESSIONS

MONDAY, OCTOBER 31

5:24PM

Design and Testing of Additively Manufactured Topology Optimized Gas Turbine Exhaust to Supercritical Co2 Waste Heat Recovery Heat Exchanger

Technical Presentation: IMECE2022-9987

*Alexander Rattner - Penn State University
Noshawan Adil - Penn State University
Evan Landrum - Siemens Energy, Inc.
Anand Kulkarni - Siemens Energy, Inc.
Sebastien Dryepontd - Oak Ridge National Laboratory*

11-15: Ultra-Low and Ultra-High Thermal Conductivity Materials

11-15-01: Topics in Heat Transfer

4:00PM–5:45PM - CONVENTION CENTER, A226

4:00PM

Ultrahigh Thermal Conductivity in Three-Dimensional Covalent Organic Frameworks

Technical Presentation: IMECE2022-94531

*Hao Ma - Oak Ridge National Laboratory
Zara Aamer - Cornell University
Zhiting Tian - Cornell University*

4:21PM

Deep Neural Network Accelerated High-Throughput Screening 50,000 Cubic Structures With Ultralow Lattice Thermal Conductivity

Technical Presentation: IMECE2022-100106

*Alejandro Rodriguez - University of South Carolina
Ming Hu - University of South Carolina*

4:42PM

Impact of High-Temperature and High-Pressure on Transient Boiling

Technical Presentation: IMECE2022-95132

*Ezekiel Villarreal - University of Pittsburgh
Ursula Zangrilli – U.S. Department of Defense
Yuan Gao - University of Pittsburgh
Heng Ban - University of Pittsburgh*

5:03PM

Investigation of Thermal Characteristics of Nonmetals Under Ultrahigh-Frequency Surface Heating

Technical Presentation: IMECE2022-100244

*Milad Nasiri - University of Nevada, Reno
Yan Wang - University of Nevada, Reno
Milad Mozafarifard - University of Nevada, Reno*

5:24PM

Thermal Behavior of Hydraulically Activated Insulated CenoPCM-Concrete Wall: An Experimental and Numerical Study

Technical Presentation: IMECE2022-100020

*Zhenglai Shen - Oak Ridge National Laboratory
Som Shrestha - Oak Ridge National Laboratory
Yucen Li - The University of Tennessee Knoxville
Adam Brooks - Oak Ridge National Laboratory
Xiaobing Liu - Oak Ridge National Laboratory
Hongyu Zhou - The University of Tennessee Knoxville
Jialai Wang - The University of Alabama*



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TECHNICAL SESSIONS

TUESDAY, NOVEMBER 1

TUESDAY, NOVEMBER 1

11-4: Nanoscale Measurements of Thermophysical Properties**11-04-01: Nanoscale Measurements of Thermophysical Properties**

10:15AM–12:00PM - CONVENTION CENTER, B234

10:15AM

Isolating Interfacial Thermal Conductances at Nanoparticle-Ligand and Ligand-Solvent Interfaces for Heated Nanoparticle Suspensions

Technical Presentation: IMECE2022-95848

Yuxing Liang - Carnegie Mellon University
Benjamin Diroll - Argonne National Laboratory
Kaelin Wong - Zhejiang University–University of Illinois at Urbana-Champaign Institute
Wee-Liat Ong - Zhejiang University–University of Illinois at Urbana-Champaign Institute
Richard D. Schaller - Argonne National Laboratory
Jonathan Malen - Carnegie Mellon University

10:36AM

Combining Ratiometric Thermometry and Super-Resolution Imaging of Heavily Doped Upconverting Nanoparticles

Technical Presentation: IMECE2022-99044

Ziyang Ye - University of Rochester
Andrea Pickel - University of Rochester

10:57AM

Temperature-Dependent Excited State Lifetimes of Nitrogen Vacancy Centers in Individual Nanodiamonds

Technical Presentation: IMECE2022-99520

Dinesh Bommidi - University of Rochester
Andrea Pickel - University of Rochester

11:18AM

Ultrafast Spatiotemporal and Nanometric Measurement of Thermal Transport in Thin Film Gold

Technical Presentation: IMECE2022-99638

Mauricio Segovia - Purdue University
Xianfan Xu - Purdue University

11:39AM

Pushing the Spatial and Temporal Limits of Thermorefectance Measurements

Technical Presentation: IMECE2022-98807

Wyatt Hodges - Sandia National Laboratories
Amun Jarzembki - Sandia National Laboratories
Brenden Herkenhoff - New Mexico Institute of Mining and Technology
Ben Treweek - Sandia National Laboratories
Anthony McDonald - Sandia National Laboratories
Derek Wilke - Sandia National Laboratories
Tim Walsh - Sandia National Laboratories
Paul Clem - Sandia National Laboratories
Gregory Pickrell - Sandia National Laboratories

11-8: Fundamentals of Phase-Change Including Micro/Nanoscale Effects: Boiling, Evaporation, Freezing, and Condensation**11-08-01: Fundamentals of Phase-Change Including Micro/Nanoscale Effects: Boiling, Evaporation, Freezing, and Condensation**

10:15AM–12:00PM - CONVENTION CENTER, B235

10:15AM

Modeling Frost Formation in Freeze-Out Purification of Gases for Cryogenic Applications

Technical Paper Publication: IMECE2022-94985

Duncan Kroll - Michigan State University/Facility for Rare Isotope Beams
Nusair Hasan - Michigan State University/Facility for Rare Isotope Beams



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TECHNICAL SESSIONS

TUESDAY, NOVEMBER 1

10:36AM**Self-Ejection of Boiling Droplets on Thin Heated Oil Films****Technical Presentation: IMECE2022-95834***Victor Leon - Massachusetts Institute of Technology**Fabian Dickhardt - Massachusetts Institute of Technology**Kripa Varanasi - Massachusetts Institute of Technology***10:57AM**

Critical Heat Flux Enhancement on Cylindrical Tubes With Circumferential Micro-Channels During Saturated Pool Boiling of Water

Technical Paper Publication: IMECE2022-95846*Omar Hernandez Rodriguez - The University of Texas at El Paso**Md. Mahamudur Rahman - The University of Texas at El Paso***11-5: Techniques Development for Thermophysical Characterization****11-05-01: Techniques Development for Thermophysical Characterization****1:30PM–3:15PM - CONVENTION CENTER, B234****1:30PM****An Analytical Model of the Linear Variable Differential Transformer****Technical Presentation: IMECE2022-94828***Yuan Gao - University of Pittsburgh**Heng Ban - University of Pittsburgh***1:51PM****A New Spatial Resolved Infrared Thermography (SR-IRT) Method for In-Plane Thermal Conductivity Tensor Measurement****Technical Presentation: IMECE2022-95096***Dihui Wang - University of Pittsburgh**Heng Ban - University of Pittsburgh***2:12PM****Operational Performance of a Photonic Based Microcalorimeter: Specific Heat Measurement****Technical Paper Publication: IMECE2022-95148***Yuwei Zhang - Northeastern University**Gregory Kowalski - Northeastern University***2:33PM****Tranducerless Time Domain Reflectance Measurement of In-Plane Thermal Conductivity of Two-Dimensional Materials****Technical Presentation: IMECE2022-99092***Sorren Warkander - University of California, Berkeley**Junqiao Wu - University of California, Berkeley***2:54PM****Determination of FDTR Lateral Resolution for Heterogeneously Integrated Micro Electronics****Technical Presentation: IMECE2022-99967***Brenden Herkenhoff - New Mexico Institute of Mining and Technology**Wyatt Hodges - Sandia National Laboratories**Benjamin Treweek - Sandia National Laboratories**Amun Jarzembski - Sandia National Laboratories**Timothy Walsh - Sandia National Laboratories**Gregory Pickrell - Sandia National Laboratories***11-8: Fundamentals of Phase-Change Including Micro/Nanoscale Effects: Boiling, Evaporation, Freezing****11-08-02: Fundamentals of Phase-Change Including Micro/Nanoscale Effects: Boiling, Evaporation, Freezing, and Condensation****IMECE**[®]**ONE GREAT LEARNING EXPERIENCE.**
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TECHNICAL SESSIONS

TUESDAY, NOVEMBER 1

1:30PM–3:15PM - CONVENTION CENTER, B235

1:30PM

Experimental Study of the Nano-Fin Effect (NFE) During Thin Film Evaporation From Nanopores in Anodic Aluminum Oxide (AAO) Membrane Substrates Integrated With Nano-Thermocouple/Thin Film Thermocouple (TFT) Array

Technical Paper Publication: IMECE2022-96168

Julie Shafer - Texas A&M University

Jonghyun Lee - Texas A&M University

Ashok Thyagarajan - Texas A&M University

Debjyoti Banerjee - Texas A&M University

1:51PM

Numerical Simulation of Three Bubbles Interaction During Flow Boiling of Water in Microchannel

Technical Paper Publication: IMECE2022-96244

Dewan Rahman - California State University, Northridge

Abhijit Mukherjee - California State University Northridge

2:12PM

Numerical Simulation for Analyzing Interfacial Velocity and Interfacial Forces of a Bubble Motion in Taper Micro Gap

Technical Paper Publication: IMECE2022-97021

Divyprakash Pal - Rochester Institute of Technology

Maharshi Shukla - Rochester Institute of Technology

Isaac Perez-Raya - Rochester Institute of Technology

Satish Kandlikar - Rochester Institute of Technology

2:33PM

Review of Optical Techniques for Studying Interfacial Dynamics in Multi-Phase Flows and Phase Change Heat Transfer

Technical Paper Publication: IMECE2022-97051

Jonghyun Lee - Texas A&M University

Debjyoti Banerjee - Texas A&M University

2:54PM

Relevant Aspects to Generate Reliable Simulations of Boiling Heat Transfer

Technical Paper Publication: IMECE2022-97056

Isaac Perez-Raya - Rochester Institute of Technology

11-8: Fundamentals of Phase-Change Including Micro-/Nanoscale Effects: Boiling, Evaporation, Freezing, and Condensation

11-08-03: Fundamentals of Phase-Change Including Micro/Nanoscale Effects: Boiling, Evaporation, Freezing, and Condensation

3:30PM–5:15PM - CONVENTION CENTER, B235

3:30PM

Phase Identification in Cryopreserved Systems Using the 3ω Method

Technical Presentation: IMECE2022-98147

Spencer Alliston - University of California, Berkeley

Chris Dames - University of California, Berkeley

3:51PM

Numerical Modeling and Optimization of Metallic Porous Structures for Passive Pumping in Solar-Thermal Desalination Systems

Technical Presentation: IMECE2022-99485

Abdullah Alfarhan - University of Dayton

Andrew Schrader - University of Dayton

4:12PM

Electrowetting-Modulated Enhancement of Critical Heat Flux in Pool Boiling



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TECHNICAL SESSIONS

TUESDAY, NOVEMBER 1

Technical Presentation: IMECE2022-99627*Dong Liu - University of Houston**Yi Lu - Beijing Jiaotong University***4:33PM****Droplet Wicking and Spreading on a Surface Covered by Titanium Dioxide Nanotube Arrays****Technical Presentation: IMECE2022-99631***Dong Liu - University of Houston**Vishal Talari - University of Houston**Lilly Shaffer - University of Houston**Oomman Varghese - University of Houston**Maggie Paulose - University of Houston***4:54PM****A Thermal Brine Concentrator Using Polymer Surfaces With Tunable Wettability for Zero Liquid Discharge Desalination****Technical Presentation: IMECE2022-99929***Walter Parker - Georgia Institute of Technology**Akanksha Menon - Georgia Institute of Technology***11-7: Thermophysical Properties Modeling and Prediction****11-07-01: Thermophysical Properties Measurement and Modeling****3:30PM–5:15PM - CONVENTION CENTER, B234****3:30PM****Investigation of Passive Radiative Cooling Using Biopolymers****Technical Paper Publication: IMECE2022-97143***Zahra Kamali Khanghah - University of Nebraska-Lincoln**Miguel Moreno Tenorio - University of Nebraska-Lincoln**Judith Brown - University of Nebraska-Lincoln**Guilherme Mainieri Eymael - University of Nebraska-Lincoln**Mohammad Ghashami - University of Nebraska-Lincoln***3:51PM****Phonon Scattering and Vibrational Localization in Embedded Nanoparticle Composites****Technical Presentation: IMECE2022-99181***Joseph Feser - University of Delaware**Ongira Chowdhury - University of Delaware***4:12PM****Phonon Boltzmann Transport Equation Based Simulation of Frequency Domain Thermo-Reflectance Experiments****Technical Paper Publication: IMECE2022-95630***Siddharth Saurav - The Ohio State University**Sandip Mazumder - The Ohio State University***4:33PM****Bruise Development Measurement in Apples Using Thermal Imaging Technique****Technical Paper Publication: IMECE2022-96135***Sathish Kumar Gurupatham - Kennesaw State University**Caleb Bailey - Kennesaw State University***4:54PM****Lattice Thermal Transport Properties of Methane Hydrates From Deep Neural Network Interatomic Potentials****Technical Presentation: IMECE2022-100207***Iyyappa Rajan Panneerselvam - University of Nevada, Reno**Haoran Cui - University of Nevada, Reno**Tengfei Ma - University of Nevada, Reno**Yan Wang - University of Nevada, Reno*

TECHNICAL SESSIONS

WEDNESDAY, NOVEMBER 2

WEDNESDAY, NOVEMBER 2

Track 11: Heat Transfer and Thermal Engineering

Wednesday, November 2, 9:45AM-10:30AM

Room: A216

Greater Columbus Convention Center

Title: Multiscale Simulation Techniques for Sub-continuum Phonon and Gas-Phase

Jayathi Y. Murthy
University of California

11-17: Radiative Properties of Nanostructures**11-17-01: Radiative Properties of Nanostructures****10:45AM–12:30PM - CONVENTION CENTER, B242/B243****10:45AM**

Design Transparent Radiative Cooler Using Machine Learning and Quantum Computing

Technical Presentation: IMECE2022-95001

Seongmin Kim - University of Notre Dame
Seunghyun Moon - University of Notre Dame
Eungkyu Lee - Kyung Hee University
Tengfei Luo - University of Notre Dame

11:06AM

Active Control of Thermal Emission by Graphene-Nanowire Coupled Plasmonic Metasurfaces

Technical Presentation: IMECE2022-98888

Jiayu Li - Carnegie Mellon University
Zhuo Li - Carnegie Mellon University
Xiu Liu - Carnegie Mellon University
Stanislav Maslovskiy - University of Aveiro
Sheng Shen - Carnegie Mellon University

11:27AM

Visibly Transparent and Infrared Reflective Coatings for Personal Thermal Management and Thermal Camouflage

Technical Presentation: IMECE2022-98889

Ho Kun Woo - University of Illinois at Urbana-Champaign
Kai Zhou - University of Illinois at Urbana-Champaign
Su-Kyung Kim - Korea University
Adrian Manjarrez - University of Illinois at Urbana-Champaign
Muhammad Jahidul Hoque - University of Illinois at Urbana-Champaign
Tae-Yeon Seong - Korea University
Lili Cai - University of Illinois at Urbana-Champaign

11:48AM

Hierarchically Structured Self-Cleaning Polymer Composites for Daytime Radiative Cooling

Technical Presentation: IMECE2022-99170

Kai Zhou - University of Illinois at Urbana-Champaign
Xiao Yan - University of Illinois at Urbana-Champaign
Seung Oh - Construction Engineering Research Laboratory
Gabriela Padilla-Rivera - Construction Engineering Research Laboratory
Hyunjung Kim - Construction Engineering Research Laboratory
Donald Cropek - Construction Engineering Research Laboratory
Nenad Miljkovic - University of Illinois at Urbana-Champaign
Lili Cai - University of Illinois at Urbana-Champaign

12:09PM

Polarized Thermal Emission Analysis Described by Stokes Parameters Based on Fluctuational Electrodynamics



TECHNICAL SESSIONS

WEDNESDAY, NOVEMBER 2

Technical Presentation: IMECE2022-99179

Chiyu Yang - Georgia Institute of Technology
 Zhuomin Zhang - Georgia Institute of Technology
 Wenshan Cai - Georgia Institute of Technology

11-13: First-Principles Calculations in Thermal Transport in Solids**11-13-01: Thermal Transport in Solids****10:45AM–12:30PM - CONVENTION CENTER, B235****10:45AM****Thermal Studies of Si Thin Films Under Tensile Strains****Technical Presentation: IMECE2022-96697**

Qiyu Chen - The University of Arizona
 Fabian Medina - The University of Arizona
 Sien Wang - The University of Arizona
 Qing Hao - The University of Arizona

11:06AM**Thermal Transport Properties of Iron-Doped MoS₂ (Fe:MoS₂)****Technical Presentation: IMECE2022-99814**

Elham Easy - Stevens Institute of Technology
 Mengqi Fang - Stevens Institute of Technology
 Mingxing Li - Brookhaven National Laboratory
 Eui-Hyeok Yang - Stevens Institute of Technology
 Xian Zhang - Stevens Institute of Technology

11:27AM**Strain Engineering of Thermal Transport Properties on Two Dimensional Materials****Technical Presentation: IMECE2022-100103**

Xian Zhang - Stevens Institute of Technology
 Yingtao Wang - Stevens Institute of Technology

11:48AM**First Principles Prediction of Thermal Conductivity at Ultra-High Temperatures****Technical Presentation: IMECE2022-95278**

Tianli Feng - The University of Utah
 Janak Tiwari - The University of Utah
 Xiaolong Yang - Chongqing University

12:09PM**Ab Initio Modeling of Phonon Transport in Refractory Di-Silicides****Technical Presentation: IMECE2022-99059**

Prince Sharma - Lehigh University
 Ganesh Balasubramanian - Lehigh University

11-15: Ultra-Low and Ultra-High Thermal Conductivity Materials**11-15-01: Topics in Heat Transfer****10:45AM–12:30PM - CONVENTION CENTER, A226****10:45AM****Failure Investigation of Secondary Superheater (SSH) Tube Boiler in the Coal Switching Case****Technical Paper Publication: IMECE2022-96706**

Rachmat Hermawan - PT PLN (Persero) Center of Excellence
 Didi Rooscote - PT Indonesia Power
 Agung Sidang Kustiawan - PT PLN (Persero) Center of Excellence
 Herry Nugraha - PT PLN (Persero) Center of Excellence



TECHNICAL SESSIONS

WEDNESDAY, NOVEMBER 2

11:06AM

Experimental Investigation of Evaporator and Condenser Placement Configuration for Oscillating Heat Pipes

Technical Paper Publication: IMECE2022-94326

Oswaldo Castro - California State University, Los Angeles

Kieran Wolk - University of California, Los Angeles

Benjamin Furst - Jet Propulsion Laboratory

Eric Sunada - Jet Propulsion Laboratory

Scott Roberts - Jet Propulsion Laboratory

Takuro Daimaru - Jet Propulsion Laboratory

Jim Kuo - California State University, Los Angeles

John Bellardo - California Polytechnic State University, San Luis Obispo

11:27AM

Experimental Investigation of Micro-Oscillating Heat Pipes With 100 μm Characteristic Size

Technical Presentation: IMECE2022-99534

Qian Qian - Purdue University

Justin Weibel - Purdue University

Liang Pan - Purdue University

11:48AM

Flexible High-Performance Nanostructured Thermal Interface

Technical Presentation: IMECE2022-99160

Lin Jing - Carnegie Mellon University

Sheng Shen - Carnegie Mellon University

12:09PM

Oscillating Gadolinium Thermal Diode Utilizing Gravitational and Temperature-Dependent Magnetic Forces

Technical Presentation: IMECE2022-100148

Qing Zhu - Rice University

11-16: Nanoscale Phase Change Heat Transfer

11-16-01: Nanoscale Phase Change Heat Transfer

2:00PM–3:45PM - CONVENTION CENTER, B235

2:00PM

Evaporation of Water Using Coarse Grain Molecular Dynamics

Technical Presentation: IMECE2022-98654

Sumith Yesudasan - Sam Houston State University

2:21PM

Adsorbed Layer Transport Dominates Thin Film Evaporation in Nanoconfinements

Technical Presentation: IMECE2022-99623

Ali Beskok - Southern Methodist University

Mustafa Ozsipahi - Southern Methodist University

2:42PM

Quasi-Liquid Surface With Patterned Wettability for Condensation

Technical Presentation: IMECE2022-99740

Dylan Boylan - The University of Texas at Dallas

Deepak Monga - The University of Texas at Dallas

Li Shan - The University of Texas at Dallas

Zongqi Guo - The University of Texas at Dallas

Xianming Dai - The University of Texas at Dallas



TECHNICAL SESSIONS

WEDNESDAY, NOVEMBER 2

3:03PM**Sustainable Phase Separation on Microchannels-Elevated Micromembranes****Technical Presentation: IMECE2022-99965**

Li Shan - The University of Texas at Dallas
Zongqi Guo - The University of Texas at Dallas
Deepak Monga - The University of Texas at Dallas
Dylan Boylan - The University of Texas at Dallas
Xianming Dai - The University of Texas at Dallas

11-17: Radiative Properties of Nanostructures**11-17-02: Radiative Properties of Nanostructures****2:00PM–3:45PM - CONVENTION CENTER, B242/B243****2:00PM****Far-Field Thermal Emission From Nanoparticle Array****Technical Presentation: IMECE2022-99356**

Hakan Salihoglu - Carnegie Mellon University
Zhuo Li - Carnegie Mellon University
Sheng Shen - Carnegie Mellon University

2:21PM**Temperature-Dependent Radiative Heat Transfer in Hyperbolic Materials****Technical Presentation: IMECE2022-99547**

Yikang Chen - Purdue University
Mauricio Segovia Pacheco - Purdue University
Ziyang Chen - Purdue University
Hakan Salihoglu - Purdue University
Xianfan Xu - Purdue University

2:42PM**Control of Far-Field Thermal Radiation With Nonreciprocal Materials and Nanophotonic Designs****Technical Presentation: IMECE2022-99648***Bo Zhao - University of Houston***3:03PM****Broadband Nonreciprocal Emission and Absorption Using Epsilon-Near-Zero Metamaterial****Technical Presentation: IMECE2022-99933**

Zhenong Zhang - The Pennsylvania State University
Linxiao Zhu - The Pennsylvania State University

3:24PM**Spectral Phonon Transport Across Interfaces: The Effects of Interfacial Engineering****Technical Presentation: IMECE2022-95282***Tianli Feng - The University of Utah***11-26: CMS - Emissions Reduction Technologies and Decarbonization****11-26-01: Topics in Combustion and Fire****4:00PM–5:45PM - CONVENTION CENTER, B235****4:00PM****Numerical Study of Effect of Wall Thermal Boundary Conditions in Non-Premixed Flame Dynamics in a Confined Channel****Technical Presentation: IMECE2022-100177**

Nabin Mahat - Idaho State University
Rajib Mahamud - Idaho State University

4:21PM**Effect of Pyrolysis-Front Velocity on the Properties of Biochar Produced With a TLUD Reactor****Technical Paper Publication: IMECE2022-95270**

Ziad Nasef - University of California, Merced
Hector Gomez - University of California, Merced
Sourov Kumar Mondal - University of California, Merced
Gerardo Diaz - University of California, Merced

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TECHNICAL SESSIONS

WEDNESDAY, NOVEMBER 2

4:42PM**A Comparative Study on the CFD Simulation of Wood Stove With Variant Turbulence Models****Technical Presentation: IMECE2022-99539***Jiaxuan Han - The Ohio State University**Mia Bridgman - The Ohio State University**Shawn Midlam-Mohler - The Ohio State University**Zhenyu Wang - The Ohio State University***5:03 PM****Development of Cfd Model to Study the Spread of Wildfires****Technical Paper Publication: IMECE2022-95980***Inês Gonçalves - Universidade do Minho**João Marques - Universidade do Minho**João Pedro Silva - Universidade do Minho**José Carlos Teixeira - Universidade do Minho**Filipe Alvelos - Universidade do Minho**Teresa Tavares - Universidade do Minho**Senhorinha Teixeira - University of Minho***11-18: Nanoscale Radiative Thermal Devices/Systems****11-18-01: Nanoscale Radiative and Tunable Heat Transfer****4:00PM–5:45PM - CONVENTION CENTER, B242/B243****4:00PM****Non-Reciprocal Thermal Radiation Using Spatiotemporal Modulation of Graphene****Technical Presentation: IMECE2022-99330***Alok Ghanekar - University of Southern California**Jiahui Wang - Stanford University**Shanhui Fan - Stanford University**Michelle Povinelli - University of Southern California***4:21PM****Design and Analysis of Electrothermal Metasurfaces****Technical Presentation: IMECE2022-99448***Xiu Liu - Carnegie Mellon University**Zhuo Li - Carnegie Mellon University**Zexiao Wang - Carnegie Mellon University**Hyeong Seok Yun - Carnegie Mellon University**Sheng Shen - Carnegie Mellon University***4:42PM****High Phonon Scattering Rates Suppress Thermal Conductivity in Hyperstoichiometric Uranium Dioxide****Technical Presentation: IMECE2022-94462***Hao Ma - Oak Ridge National Laboratory**Matthew Brysan - Oak Ridge National Laboratory**Judy Pang - Oak Ridge National Laboratory**Douglas Abernathy - Oak Ridge National Laboratory**Daniel Antonio - Idaho National Laboratory**Krzysztof Gofryk - Idaho National Laboratory**Michael Manley - Oak Ridge National Laboratory***5:03PM****Thermal Conductivity Measurements as an Alternative Way to Understand the Effect of Poling on Domain Wall Density for PMN-PT Single Crystals****Technical Presentation: IMECE2022-99290***Ankit Negi - North Carolina State University**Hwang Pill Kim - North Carolina State University**Zilong Hua - Idaho National Laboratory**Yong Zhu - North Carolina State University**Xiaoning Jiang - North Carolina State University**Jun Liu - North Carolina State University***IMECE**[®]**ONE GREAT LEARNING EXPERIENCE.**
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TECHNICAL SESSIONS

THURSDAY, NOVEMBER 3

THURSDAY, NOVEMBER 3

11-10: Fundamentals of Radiative Transport and Conduction Including Micro/Nanoscale Effects**11-10-01: Fundamentals of Radiative Transport and Conduction Including Micro/Nanoscale Effects****10:15AM–12:00PM - CONVENTION CENTER, B230/B231****10:15AM****Hybrid Solver for the Radiative Transport Equation in Nongray Combustion Gases****Technical Paper Publication: IMECE2022-94556***Nehal Jajal - The Ohio State University**Sandip Mazumder - The Ohio State University***10:36AM****Measurements of Gas Conduction via Rarefied Nitrogen Gas Within Micro/nanoconfinements****Technical Presentation: IMECE2022-95545***Greg Acosta - University of Nebraska-Lincoln**Mohammad Ghoshami - University of Nebraska-Lincoln***10:57AM****Materials Selection for Ultrathin Conduction via Polaritonic Thermal Transport****Technical Presentation: IMECE2022-95583***Thomas Beechem - Purdue University**Suraj Kumar Raja Ratnam - Purdue University***11:18AM****Optimization of Radiative Fin Planar Geometry and Thickness Profile for Maximum Heat Rate, Tip Temperature, or Fin Efficiency****Technical Presentation: IMECE2022-99855***Nicholas Debortoli - University of Dayton**Josh Cannon - Brigham Young University**Brian Iverson - Brigham Young University**Rydge Mulford - University of Dayton***11-11: Machine Learning in Nanoscale Thermal Transport****11-11-01: Machine Learning in Nanoscale Thermal Transport****2:00PM–3:45PM - CONVENTION CENTER, B230/B231****2:00PM****Exploring High Thermal Conductivity Polymer Blends via Data-Driven Approach****Technical Presentation: IMECE2022-95164***Jiaxin Xu - University of Notre Dame**Hanfeng Zhang - University of Notre Dame**Tengfei Luo - University of Notre Dame***2:21PM****Physics-Informed Neural Networks for Solving Multiscale Time-Dependent Phonon Boltzmann Transport Equation****Technical Presentation: IMECE2022-95296***Jiahang Zhou - University of Notre Dame**Ruiyang Li - University of Notre Dame**Tengfei Luo - University of Notre Dame***2:42PM****Exploring Polymer Thermal Conductivity Using Molecular Simulations and Machine Learning****Technical Presentation: IMECE2022-95756***Hanfeng Zhang - University of Notre Dame**Ruimin Ma - University of Notre Dame**Jiaxin Xu - University of Notre Dame**Tengfei Luo - University of Notre Dame***3:03PM****Million-Scale Atomic Data Integrated Single Deep Neural Network for Predicting Complete Phonon Properties of 50,000 Cubic Structures****IMECE**[®]**ONE GREAT LEARNING EXPERIENCE.**
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TECHNICAL SESSIONS

THURSDAY, NOVEMBER 3

Technical Presentation: IMECE2022-100094

Alejandro Rodriguez - University of South Carolina
Ming Hu - University of South Carolina

11-21: Multi-Scale Multi-Phase Heat Transfer Equipment**11-21-01: Single- and Multi-Phase Heat Transfer Equipment****2:00PM–3:45PM - CONVENTION CENTER, A225****2:00PM**

Experimental Characterization of Critical Heat Flux and Minimum Film Boiling Heat Flux for Additively Manufactured Cooling Channels for Liquid Nitrogen Saturated Flow Boiling

Technical Paper Publication: IMECE2022-95562

Debra Ortega - The University of Texas at El Paso
Alejandro Amador - The University of Texas at El Paso
Ahsan Choudhuri - The University of Texas at El Paso
Md. Mahamudur Rahman - The University of Texas at El Paso

2:21PM

Heat Transfer in Microchannel Heat Exchanger With Enhanced Surface Structure

Technical Paper Publication: IMECE2022-96942

Fadi Alnaimat - United Arab Emirates University
Bobby Mathew - United Arab Emirates University
Saeed Al Nuaimi - United Arab Emirates University

2:42PM

Experimental Investigation of Solar-Thermal Desalination Platform Leveraging Dynamic Flash Evaporation and Swirl Flow Separator

Technical Paper Publication: IMECE2022-96099

Ashok Thyagarajan - Texas A&M University
Vijay Dhir - University of California, Los Angeles
Debjyoti Banerjee - Texas A&M University

3:03PM

Experimental Investigation of Thermal Energy Storage (TES) Platform Leveraging Phase Change Materials in a Chevron Plate Heat Exchanger

Technical Paper Publication: IMECE2022-96226

Sunil Kumar - Texas A&M University
Ashok Thyagarajan - Texas A&M University
Debjyoti Banerjee - Texas A&M University

3:24PM

Review of Thermal-Hydraulic Modeling Methods of Printed Circuit Steam Generators for Small Modular Reactors

Technical Paper Publication: IMECE2022-96578

So-Bin Cho - University of Michigan
Chengqi Wang - University of Michigan
Todd Allen - University of Michigan
Xiaodong Sun - University of Michigan

11-14: Molecular Dynamics Simulation of Thermal Transport in Nanostructures or Across Interface**11-14-01: Molecular Dynamics Simulation of Thermal Transport in Nanostructures or Across Interface****4:00PM–5:45PM - CONVENTION CENTER, B230/B231****4:00PM**

Layer Dependent Thermal Conductivity in MoS₂: A Molecular Dynamics Study

Technical Paper Publication: IMECE2022-96075

Mahabubur Rahman - Clemson University
Huijuan Zhao - Clemson University

4:21PM

Freezing Point Depression of Water in Calcium Chloride Solution Using Molecular Dynamic Simulations



TECHNICAL SESSIONS

THURSDAY, NOVEMBER 3

Technical Presentation: IMECE2022-99372*Derek Scott - Lehigh University**Lida Yan - Lehigh University**Ganesh Balasubramanian - Lehigh University***4:42PM****The Significant Effect of Coherent-Incoherent Phonon Nonequilibrium on Thermal Transport in Superlattices****Technical Presentation: IMECE2022-99766***Yan Wang - University of Nevada, Reno**Tengfei Ma - University of Nevada, Reno***5:03PM****Comprehensive Investigation of Phonon Scattering and Phonon Coherence in Nanomesh Structures****Technical Presentation: IMECE2022-99995***Haoran Cui - University of Nevada, Reno**Tengfei Ma - University of Nevada, Reno**Yan Wang - University of Nevada, Reno***5:24PM****Molecular Dynamics Analysis of Mode-Resolved Phonon Scattering by Embedded Nanoparticles****Technical Presentation: IMECE2022-100203***Theodore Maranets - University of Nevada, Reno**Yan Wang - University of Nevada, Reno***11-29: Aerospace Heat Transfer****11-29-01: Aerospace Heat Transfer****4:00PM–5:45PM - CONVENTION CENTER, A225****4:00PM****Development of Phase Change Materials With Improved Thermal Properties for Space-Related Applications****Technical Paper Publication: IMECE2022-94380***Patrick Adegbaye - University of the District of Columbia**Yong Pei - University of Maryland**Mehdi Kabir - University of the District of Columbia**Herve Cabrel Sandja Tchamba - University of the District of Columbia**Bao Yang - University of Maryland**Jiajun Xu - University of the District of Columbia***4:21PM****Design of an Improved Vertical Spiral Closed Loop Geothermal Heat Exchanger****Technical Paper Publication: IMECE2022-94381***Tarun Malhotra - University of the District of Columbia**Dorian Davis - University of the District of Columbia**Deshawn Adams - University of the District of Columbia**Fisseha Gebre - University of the District of Columbia**Jiajun Xu - University of the District of Columbia***4:42PM****Thermal Design and Parametric Study of a Sustainable Greenhouse for Microgravity Environments****Technical Paper Publication: IMECE2022-96211***Nivedha Karigiri Madhusudhan - Florida Institute of Technology**Hamidreza Najafi - Florida Institute of Technology***5:03PM****Assessment of Binary Pressure Sensitive Paint (BPSP) for Film Cooling Effectiveness and Heat Transfer Coefficient Measurement for Leading Edge Film Cooling****Technical Paper Publication: IMECE2022-94315***Timothy Burdett - Texas A&M University**Ming-Feng Yeh - Texas A&M University**Lesley Wright - Texas A&M University**Je-Chin Han - Texas A&M University***IMECE**[®]**ONE GREAT LEARNING EXPERIENCE.**
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TECHNICAL SESSIONS

Track 12: Mechanics of Solids, Structures and Fluids Sponsored by the Applied Mechanics Division

Topics:

- 12-1: Fracture and Failure of Reinforced Polymer Matrix Composite Materials
- 12-2: Modeling of the Fracture, Failure and Fatigue in Solids
- 12-3: Mechanics and Design of Cellular Materials
- 12-4: Multiscale Models and Experimental Techniques for Composite Materials and Structures
- 12-5: Data-Enabled Predictive Modeling, Scientific Machine Learning, and Uncertainty Quantification in Computational Mechanics
- 12-6: Data-Driven Modeling and Simulation for Computational Biomedicine
- 12-7: Mechanics of Soft Materials
- 12-8: Peridynamic Modeling of Materials' Behavior
- 12-9: Multiphysics Simulations and Experiments for Solids
- 12-10: Multi-scale and Multi-physics Computations in Fluids and Solids
- 12-11: Perspective on Fracture and Failure Mechanics
- 12-12: Mechanical Metamaterials
- 12-13: Modeling and Experiments in Nanomechanics and Nanomaterials
- 12-14: CONCAM Distinguished Lectures on Computational Mechanics
- 12-15: Dynamic Failure of Materials & Structures
- 12-16: Drucker Medal Symposium
- 12-17: Computational Methods in Heterogeneous Porous Media
- 12-18: Functional Origami and Kirigami-inspired Structures and Metamaterials
- 12-19: Emerging Topology and Shape Optimization Techniques in Computational Design of Materials and Structures
- 12-20: Instabilities in Solids and Structures
- 12-21: General: Mechanics of Solids, Structures and Fluids

- 12-22: Advances in Topology Optimization
- 12-23: Functional Soft Composites - Design, Mechanics, and Manufacturing
- 12-24: High-Performance Nanocomposite Materials Systems

ACKNOWLEDGMENT TRACK ORGANIZERS

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Track Co-Organizer: Kenji Takizawa

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TECHNICAL SESSIONS

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 Yozo Mikata - Fluor



TECHNICAL SESSIONS

MONDAY, OCTOBER 31

TRACK 12

MONDAY, OCTOBER 31

Track 12: Mechanics of Solids, Structures and Fluids

Monday, October 31, 9:45AM - 10:30AM

Room: B230/B231

Greater Columbus Convention Center

Title: Turbulence of Low Temperature Helium*K.R. Sreenivasan
New York University***12-12: Mechanical Metamaterials****12-12-01: Mechanical Metamaterials****10:45AM–12:30PM - CONVENTION CENTER, B230/B231****10:45AM****Selective Pattern for Circular Notches Distribution as a Means to Enhance Structural Mechanical Response of Tubular Components****Technical Paper Publication: IMECE2022-94056***Cuneyt Sakonder - Texas A&M University
Marcelo Paredes - Texas A&M University***11:06AM****Energy Absorption of Axially Loaded Thin-Walled Pressurized Cylinders****Technical Paper Publication: IMECE2022-94390***Larance Haji - Lawrence Technological University
Hamid Vejdani - Lawrence Technological University
Badih Jawad - Lawrence Technological University
Vernon Fernandez - Lawrence Technological University***11:27AM****Phase Transitions in 2D Flexible Mechanical Metamaterials****Technical Presentation: IMECE2022-99142***Weijian Jiao - University of Pennsylvania
Vincent Tournat - Le Mans Université
Hang Shu - University of Pennsylvania
Hiromi Yasuda - Japan Aerospace Exploration Agency
Jordan Raney - University of Pennsylvania***11:48AM****Static and Time-Modulated Dispersion Morphing in Mechanical Rotator Lattices****Technical Presentation: IMECE2022-99236***Lezheng Fang - Georgia Institute of Technology
Michael Leamy - Georgia Institute of Technology***12:09PM****Digital Computing With Mechanical Metamaterials****Technical Presentation: IMECE2022-99376***Qianyun Zhang - University of Pittsburgh
Kaveh Barri - University of Pittsburgh
Jochen Mueller - The Johns Hopkins University
Zhong Lin Wang - Georgia Institute of Technology
Amir Alavi - University of Pittsburgh***12-9: Multiphysics Simulations and Experiments for Solids****12-09-01: Multiphysics Simulations and Experiments for Solids****10:45AM–12:30PM - CONVENTION CENTER, B244/B245****IMECE**[®]**ONE GREAT LEARNING EXPERIENCE.**
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TECHNICAL SESSIONS

MONDAY, OCTOBER 31

10:45AM

Coupling Finite Element Method With Smooth Particle Hydrodynamics to Simulate Residual Stresses in Friction Stir Processing

Technical Paper Publication: IMECE2022-93695

Kranthi Balusu - Pacific Northwest National Laboratory

Lei Li - Pacific Northwest National Laboratory

Kyoo Sil Choi - Pacific Northwest National Laboratory

Ayoub Soulami - Pacific Northwest National Laboratory

11:06AM

Incorporation of Deformation Twinning Along With Extended Voce Hardening Law in WARP3D to Predict the Response of Zircalloy

Technical Presentation: IMECE2022-94781

Shank Kulkarni - Pacific Northwest National Laboratory

Aditya Venkatraman - Pacific Northwest National Laboratory

Timothy Truster - University of Tennessee Knoxville

David Senor - Pacific Northwest National Laboratory

Ram Devanathan - Pacific Northwest National Laboratory

National Laboratory

11:27AM

Evaluation of Simulated Railhead Weld-Defect Repairs Using Ultrasound Techniques

Technical Paper Publication: IMECE2022-95140

Demario Broderick - Tuskegee University

Munshi Basit - Tuskegee University

Heshmat Aglan - Tuskegee University

11:48AM

Surface Pattern Formation Through Oscillatory Loading of Frontally Polymerized Gels: A Thermo-Chemo-Mechanical Model

Technical Presentation: IMECE2022-99038

Aditya Kumar - University of Illinois at Urbana-Champaign

Leon Dean - University of Illinois at Urbana-Champaign

Nancy Sottos - University of Illinois at Urbana-Champaign

Philippe Geubelle - University of Illinois at Urbana-Champaign

12:09PM

A New 3D Finite Element for Modeling the Elasto-Capillary Bending in Nano-Sized Solid Structures

Technical Presentation: IMECE2022-99317

Seonghwan Choi - Seoul National University

Minjae Hur - SK Hynix

Jongwon Baek - SK Hynix

Jiwoong Sue - SK Hynix

Myoung-Gyu Lee - Seoul National University

12-16: Drucker Medal Symposium

12-16-01: Drucker Medal Symposium

10:45AM–12:30PM - CONVENTION CENTER, B242/B243

10:45AM

Relation Between Blood Pressure and Pulse Wave Velocity for Human Arteries

Technical Presentation: IMECE2022-99016

Yonggang Huang - Northwestern University

Yinji Ma - Tsinghua University

Shupeng Li - Northwestern University



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TECHNICAL SESSIONS

MONDAY, OCTOBER 31

11:06AM**Mechanical Characterization of Human Aortas With Smooth Muscle Activation****Technical Presentation: IMECE2022-99552***Marco Amabili - McGill University**Giulio Franchini - McGill University**Ivan Breslavsky - McGill University***11:27AM****Soft Magnetolectric Materials****Technical Presentation: IMECE2022-99578***Pradeep Sharma - University of Houston***11:48AM****Water as a Glue****Technical Presentation: IMECE2022-99191***Muhammed Saif - University of Illinois**Yue Wang - Leibniz Institute for New Materials**Zhengwei Li - University of Illinois at Urbana-Champaign**Mohamed Elhebeary - University of Illinois at Urbana-Champaign**René Hensel - Leibniz Institute für Neue Materialien gGmbH**Eduard Arzt - Leibniz-Institut für Neue Materialien gGmbH***12:09PM****Electromyogram-Based Lip-Reading via Unobtrusive Dry Electrodes and Machine Learning Methods****Technical Presentation: IMECE2022-99773***Penghao Dong - Stony Brook University**Yuanqing Song - Stony Brook University**Petar Djuric - Stony Brook University**Shanshan Yao - Stony Brook University***12-07-01: Mechanics of Soft Materials****10:45AM–12:30PM - CONVENTION CENTER, B234****10:45AM****Spontaneous Enlargement of Receptor Clusters in Response to Pulling Traction****Technical Paper Publication: IMECE2022-89397***Alireza Sarvestani - Mercer University**Arsha Moorthy - Mercer University***11:06AM****Soft Artificial Muscle Actuators for Undersea Launch & Recovery Systems****Technical Paper Publication: IMECE2022-93951***Paul Cavallaro - Naval Undersea Warfare Center**Michael Smith - Naval Undersea Warfare Center**Jacob O'Donnell - Naval Undersea Warfare Center**Allison Redington - Naval Undersea Warfare Center**Eric Warner - Naval Undersea Warfare Center***11:27AM****Effect of Dual Environmental Aging on Flexible Polyurethane Adhesives****Technical Paper Publication: IMECE2022-95221***Mamoon Shaafaey - Michigan State University**Amir Bahrololoumi - Michigan State University**Roozbeh Dargazany - Michigan State University***11:48AM****Experimental Characterization of Polyurethane Adhesive: Independence of Environmental and Mechanical Aging****Technical Paper Publication: IMECE2022-95230***Mamoon Shaafaey - Michigan State University**Amir Bahrololoumi - Michigan State University**Roozbeh Dargazany - Michigan State University*

TECHNICAL SESSIONS

MONDAY, OCTOBER 31

12:09PM**Constitutive Modeling of the Cross-Linked Polymers During the Trio-Aging: Effects of Water, Oxygen, UV****Technical Paper Publication: IMECE2022-95558***Amir Bahrololoumi - Michigan State University**Mamoon Shaafaey - Michigan State University**Roozbeh Dargazany - Michigan State University***12-2: Modeling of the Fracture, Failure, and Fatigue in Solids****12-02-01: Modeling of the Fracture, Failure, and Fatigue in Solids****10:45AM–12:30PM - CONVENTION CENTER, B235****10:45AM****Molecular Dynamics Analysis on the Degradation Mechanism of the Crystallinity and Strength of Grain Boundaries in Heat-Resistant Alloys Under Creep-Fatigue Loading at Elevated Temperatures****Technical Paper Publication: IMECE2022-94286***Shogo Tezuka - Tohoku University**Ken Suzuki - Tohoku University***11:06AM****A Study on Fatigue Crack Growth in Single-Crystal NiTi Using Molecular Dynamics****Technical Paper Publication: IMECE2022-95794***Saeed Ataollahi - The University of Tennessee Chattanooga**Mohammad J. Mahtabi - The University of Tennessee Chattanooga***11:27AM****Modeling Dynamic Fracture in Rubber-Like Materials****Technical Presentation: IMECE2022-99841***Ida Ang - Cornell University**Bin Li - Guangdong Technion – Israel Institute of Technology**Nikolaos Bouklas - Cornell University***11:48AM****The Effects of Temperature and Microstructure on Slip in Ti-6242 Under Dwell Fatigue****Technical Presentation: IMECE2022-95321***Michelle Harr - University of Dayton Research Institute**Adam Pilchak - Air Force Research Laboratory**Samantha Daly - University of California, Santa Barbara***12:09PM****A Study of Indentation Problem With the Revisited Phase-Field Approach to Brittle Fracture****Technical Presentation: IMECE2022-99775***Aditya Kumar - Georgia Institute of Technology**Oscar Lopez-Pamies - University of Illinois at Urbana-Champaign***12-12-02: Mechanical Metamaterials****2:00PM–3:45PM - CONVENTION CENTER, B230/B231****2:00PM****Formation of Rogue Waves in One-Dimensional Mechanical Metamaterials****Technical Presentation: IMECE2022-99378***Yasuhiro Miyazawa - University of Washington**Christopher Chong - Bowdoin College**Panayotis G. Kevrekidis - University of Massachusetts Amherst**Jinkyu Yang - University of Washington***2:21PM****IMECE**[®]**ONE GREAT LEARNING EXPERIENCE.**
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TECHNICAL SESSIONS

MONDAY, OCTOBER 31

Architected Networks of Mechanologic Digits for Memory and Information Processing**Technical Presentation: IMECE2022-99570**

A.B.M. Tahidul Haque - University of Pennsylvania
Samuele Ferracin - University of Pennsylvania
Jordan Raney - University of Pennsylvania

2:42PM**Machine Learning-Based Structure-Property Correlation in Lightweight Architected Metamaterials****Technical Presentation: IMECE2022-99750**

Shengzhi Luan - Johns Hopkins University
Enze Chen - Johns Hopkins University
Stavros Gaitanaros - Johns Hopkins University

3:03PM**Temperature and Stress-Induced Recovery in Artificial Shape Memory Alloys****Technical Presentation: IMECE2022-100129**

Yunlan Zhang - Purdue University
Phani Saketh Dasia - Purdue University
Pablo Zavattieri - Purdue University

3:24PM**Auxetically Boosted Confinement in Steel Reinforced Mortar Materials****Technical Presentation: IMECE2022-100176**

Andrew Gross - University of South Carolina
Georgios Tzortzinis - Technische Universität Dresden
Simos Gerasimidis - University of Massachusetts Amherst

12-16-02: Drucker Medal Symposium**2:00PM–3:45PM - CONVENTION CENTER, B242/B243****2:00PM****Hydrogen Embrittlement in Metallic Nanowires****Technical Presentation: IMECE2022-99577***Huajian Gao - Nanyang Technological University***2:21PM****High-Throughput and Statistically-Significant Mechanical Testing of Silver Nanowires****Technical Presentation: IMECE2022-95946**

Rodrigo Bernal - The University of Texas at Dallas
Brizeida Ojeda - The University of Texas at Dallas
Abir Hossain - The University of Texas at Dallas

2:42PM**Dislocation Dynamics in High Strain Rate Compression of Single Crystal Mg Micro-Pillars****Technical Presentation: IMECE2022-100150**

Wei Cai - Stanford University
Zhaowen Lin - Northwestern University
Nicolas Bertin - Lawrence Livermore National Laboratory
Wurong Jian - Stanford University
Sylvie Aubry - Lawrence Livermore National Laboratory
Horacio Espinosa - Northwestern University

3:03PM**High Throughput Fracture Mechanics of Graphene Sheets via Decoupled Force and Deformation Measurements****IMECE**[®]

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TECHNICAL SESSIONS

MONDAY, OCTOBER 31

Technical Presentation: IMECE2022-99731*Usama Arshad - Texas A&M University**Yanxiao Li - Missouri University of Science and Technology**Congjie Wei - Missouri University of Science and Technology**Chenglin Wu - Missouri University of Science and Technology**Mohammad Naraghi - Texas A&M University***3:24PM****Kinetics of Phase Nucleation and Propagation in 2D Mote2****Technical Presentation: IMECE2022-99205***Wei Gao - Texas A&M University***12-9: Multiphysics Simulations and Experiments for Solids****12-09-02: Multiphysics Simulations and Experiments for Solids****2:00PM–3:45PM - CONVENTION CENTER, B244/B245****2:00PM****Transfer Printing of Thin Films in Electrolyte Solutions****Technical Presentation: IMECE2022-99673***Baoxing Xu - University of Virginia**Yue Zhang - University of Virginia***2:21PM****Experiments and Modeling of the Cyclic Stress and Potential Behavior of High Performance Electrodes****Technical Presentation: IMECE2022-99941***Akshay Pakhare - Michigan State University**Shawn Chester - New Jersey Institute of Technology**Siva Nadimpalli - Michigan State University***2:42PM****Effect of Strain Rate on the Creep-Fatigue Damage of Polycrystalline Ni-Base Superalloy at Elevated Temperature****Technical Paper Publication: IMECE2022-94282***Koki Nakayama - Tohoku University**Hideo Miura - Tohoku University***3:03PM****Acceleration of Intergranular Cracking in Ni-Base Alloy Gh4169 (In718) Due to the Growth of δ -Phase Around Grain Boundaries Under Creep Loading at Elevated Temperatures****Technical Paper Publication: IMECE2022-94701***Ayumi Nakayama - Tohoku University**Runzi Wang - Tohoku University**Hideo Miura - Tohoku University***3:24PM****Unified Failure Criteria for Brittle Materials****Technical Presentation: IMECE2022-94767***Young Kwon - Naval Postgraduate School***12-2: Modeling of the Fracture, Failure and Fatigue in Solids****12-02-02: Modeling of the Fracture, Failure and Fatigue in Solids****2:00PM–3:45PM - CONVENTION CENTER, B235****2:00PM****Ansys-Smart Fatigue Crack Growth With Non-Proportional Loading****Technical Presentation: IMECE2022-95029***Kaan Ozenc - Ansys Inc.**Guoyu Lin - Ansys Inc.*

TECHNICAL SESSIONS

MONDAY, OCTOBER 31

2:21PM

Numerical and Experimental Qualification of Seal Integrity of Rotary Shouldered Connections Under Combined Loads

Technical Paper Publication: IMECE2022-96180

Fei Song - Schlumberger

Michael Du - Schlumberger

Ke Li - Schlumberger

2:42PM

Ductile Fracture Under General Loading Conditions: Theory and Implementation

Technical Presentation: IMECE2022-99390

Vigneshwaran Radhakrishnan - Texas A&M University

Amine Benzerga - Texas A&M University

3:03PM

Statistics Evaluation of Nucleation Conditions Using Physics-Based Ductile Damage Modelling

Technical Presentation: IMECE2022-99849

Curt Bronkhorst - University of Wisconsin-Madison

Nan Chen - University of Wisconsin

Robert Argus - University of Wisconsin

Noah Schmelzer - University of Wisconsin

3:24PM

Strain Rate Dependence of the Mesh Objectivity in Dynamic Fracture Analyses With the Crack Band Model

Technical Presentation: IMECE2022-87962

Kedar Kirane - Stony Brook University

Taufiq Abdullah - Stony Brook University

12-7: Mechanics of Soft Materials**12-07-02: Mechanics of Soft Materials****2:00PM–3:45PM - CONVENTION CENTER, B234****2:00PM**

Effect of Network Polydispersity on Finite Deformation Elasticity and Yielding of Vitrimers

Technical Paper Publication: IMECE2022-95737

Alireza Sarvestani - Mercer University

Ryan Field - North Carolina State University

2:21PM

Independence of Environmental and Mechanical Damages on Silicone Adhesive Aged in Thermo-Oxidative Environment

Technical Paper Publication: IMECE2022-96008

Sharif Alazhary - Michigan State University

Hamid Mohammadi - Michigan State University

Mamoon Shaafaey - Michigan State University

Roozbeh Dargazany - Michigan State University

2:42PM

Adherence of a Hyperelastic Shell on a Rigid Planar Substrate

Technical Presentation: IMECE2022-96079

Wanliang Shan - Syracuse University

Kai-Tak Wan - Northeastern University

Chenxu Zhao - Syracuse University

3:03PM

The Investigation of the Effect of Various Aging Temperature Profiles on the Behavior of Neoprene Rubber Exposed to Thermo-Oxidation Aging



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TECHNICAL SESSIONS

MONDAY, OCTOBER 31

Technical Paper Publication: IMECE2022-96115

Sharif Alazhary - Michigan State University
Mamoon Shaafaey - Michigan State University
Amir Bahrololoumi - Michigan State University
Roozbeh Dargazany - Michigan State University

3:24PM**Subdivision-Stabilized B-Spline Material Point Method for Nonlinear Nearly Incompressible Solids****Technical Presentation: IMECE2022-96215**

Berkin Dortdivanlioglu - The University of Texas at Austin
Ashkan Madadi - The University of Texas at Austin

12-12: Mechanical Metamaterials**12-12-03: Mechanical Metamaterials****4:00PM–5:45PM - CONVENTION CENTER, B230/B231****4:00 PM****1-D Lattice Designs for Improved Low Density 3-D Lattice Materials****Technical Presentation: IMECE2022-100199**

Fakhreddin Emami - University of South Carolina
Andrew Gross - University of South Carolina

4:21PM**Additive Manufacturing of Reusable Energy-Absorbing Thermoplastic Polyurethane Lattices****Technical Presentation: IMECE2022-100271**

Shivam Agarwal - University of California, Los Angeles
Mateen Rabbani - University of California, Los Angeles
Lihua Jin - University of California, Los Angeles

4:42PM**Multiscale Data-Driven Design for Heat Manipulations****Technical Presentation: IMECE2022-99834**

Daicong Da - Northwestern University
Wei Chen - Northwestern University

5:03PM**Designing Architected Materials Using Neural Networks****Technical Presentation: IMECE2022-100279**

Krishnan Suresh - University of Wisconsin
Saketh Sridhara - University of Wisconsin-Madison
Aaditya Chandrasekhar - University of Wisconsin-Madison

5:24PM**Programming and Realization of Arbitrary Responses of Metastructures Under Large Deformations: A Topology Optimization Approach****Technical Presentation: IMECE2022-98909**

Xiaoja Shelly Zhang - University of Illinois at Urbana-Champaign
Weichen Li - University of Illinois at Urbana-Champaign
Fengwen Wang - Technical University of Denmark
Ole Sigmund - Technical University of Denmark

12-2: Modeling of the Fracture, Failure, and Fatigue in Solids**12-02-03: Modeling of the Fracture, Failure, and Fatigue in Solids****4:00PM–5:45PM - CONVENTION CENTER, B235****IMECE**[®]

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TECHNICAL SESSIONS

MONDAY, OCTOBER 31

4:00PM**Observations of Fatigue Cracking With Scanning Electron Microscope Digital Image Correlation****Technical Presentation: IMECE2022-94638***William LePage - The University of Tulsa***4:21PM****Novel Computational Approach for Tribology Wear Prediction****Technical Paper Publication: IMECE2022-96194***Sam Naboulsi - ASR***4:42PM****Damage Detection in a Vibration-Based Fatigue Test Using LDV Synchronized DIC****Technical Presentation: IMECE2022-100230***Brandon Furman - Utah State University**Jacob Rigby - Utah State University**Alexandra Loftin - Utah State University**Steven Koski - Utah State University**Ryan Berke - Utah State University***5:03PM****An Improved Variable Extensometer Technique to Obtain Ductility Scaling Parameters From Single Specimens****Technical Presentation: IMECE2022-100238***Ryan Berke - Utah State University**Hannah Maxwell - Utah State University**Raushan Singh - Utah State University**Hadi Mirmohammad - The University of Utah**Owen Kingstedt - The University of Utah***5:24PM****Prediction of the Generation of Intergranular Cracking in Stainless Steels Under Creep Loading at Elevated Temperatures****Technical Paper Publication: IMECE2022-94891***Ken Suzuki - Tohoku University**Koki Nakayama - Tohoku University**Ayumi Nakayama - Tohoku University**Shogo Tezuka - Tohoku University**Hideo Miura - Tohoku University***12-13: Modeling and Experiments in Nanomechanics and Nanomaterials****12-13-01: Modeling and Experiments in Nanomechanics and Nanomaterials****4:00PM–5:45PM - CONVENTION CENTER, B230/B231****4:00PM****Employment of Crack Deflection Criteria for Accurate Assessment of the Full Set of Elastic Constants of Orthorhombic Mono-Crystalline Superconducting YBCO****Technical Presentation: IMECE2022-96923***Reaz Chaudhuri - The University of Utah***4:21PM****Effect of Cut-Off Radius of BKS Potential in Shocked Fused Silica****Technical Paper Publication: IMECE2022-96062***Tanuj Gupta - Clemson University**Tristan Woods - Clemson University**Huijuan Zhao - Clemson University*

TECHNICAL SESSIONS

MONDAY, OCTOBER 31

4:42PM

Investigation on the Impact of Morphology and Arrangement of Graphene Nanoplatelet on Mechanical Behavior of Epoxy Nanocomposites

Technical Paper Publication: IMECE2022-94845
Olanrewaju Aluko - University of Michigan-Flint

5:03PM

Characterization of Electron Irradiation Induced Creep Using In Situ TEM-DIC and Finite Element Analysis

Technical Presentation: IMECE2022-99343
Yiguang Zhang - University of Illinois at Urbana-Champaign
Shen Dillon - University of California, Irvine
John Lambros - University of Illinois at Urbana-Champaign

5:24PM

Investigation of Transformation-Mediated Nano-Twin Nucleation Mechanisms in Magnesium Using Deep Neural Network Interatomic Potentials

Technical Presentation: IMECE2022-99589
Iyyappa Rajan Panneerselvam - University of Nevada, Reno
Mehrab Lotfpoor - University of Nevada, Reno
Jamie Ombogo - University of Nevada, Reno
Yan Wang - University of Nevada, Reno
Lei Cao - University of Nevada, Reno

12-7: Mechanics of Soft Materials**12-07-03: Mechanics of Soft Materials****4:00PM–5:45PM - CONVENTION CENTER, B234****4:00PM****The Elastic Plateau--Rayleigh Instability of Soft Solids**

Technical Presentation: IMECE2022-96251
Berkin Dortdivanlioglu - The University of Texas at Austin

4:21PM**A Thermo-Mechanically Coupled Model for Viscoelastomers**

Technical Presentation: IMECE2022-99150
Keven Alkhoury - New Jersey Institute of Technology
Nikola Bosnjak - Cornell University
Yueping Wang - Rutgers University
Howon Lee - Seoul National University
Siva Nadimpalli - Michigan State University
Shawn Chester - New Jersey Institute of Technology

4:42PM**Direct Three-Dimensional Numerical Simulations of Deformation Instabilities in Film-Substrate Structures From Local Wrinkling to Global Buckling**

Technical Presentation: IMECE2022-99248
Siavash Nikraves - University of New Mexico
Yu-Lin Shen - University of New Mexico



TECHNICAL SESSIONS

MONDAY, OCTOBER 31

5:03PM**A Constitutive Model for Ionically Bonded and Entangled Bulk Polyelectrolytes****Technical Presentation: IMECE2022-99437***Zhongtong Wang - Cornell University
Hongyi Cai - Cornell University
Meredith Silberstein - Cornell University***5:24PM****Characterization of the Photo-Degradation on Poly(lactic Acid) (PLA)****Technical Presentation: IMECE2022-99611***Keven Alkhoury - New Jersey Institute of Technology
Shawn Chester - New Jersey Institute of Technology***12-16: Drucker Medal Symposium****12-16-03: Drucker Medal Symposium****4:00PM–5:45PM - CONVENTION CENTER, B242/B243****4:00PM****Data-Driven Approaches for High-Throughput Materials Characterization****Technical Presentation: IMECE2022-95322***Samantha Daly - University of California,
Santa Barbara***4:21PM****An Assessment of Neural Nets as a Discretization for Large-Deformation Elastoplasticity****Technical Presentation: IMECE2022-99654***Sijun Niu - Brown University
Enrui Zhang - Brown University
Vikas Srivastava - Brown University
Yuri Bazilevs - Brown University***4:42PM****Direct Heterogeneous Material Property Determination Using Full-Field Experimental Measurements****Technical Presentation: IMECE2022-100137***Michael Sutton - University of South Carolina
Sreehari Rajan-Kattil - University of South Carolina
Subramani Sockalingam - University of South Carolina***5:03PM****High-Strength Engineered Granular Crystals****Technical Presentation: IMECE2022-99249***Francois Barthelat - University of Colorado
Navdeep Karuriya - University of Colorado***5:24PM****Architected Cementitious Materials****Technical Presentation: IMECE2022-99598***Reza Moini - Princeton University
Hadi Shagerdi Esmaeeli - Princeton University
Shashank Gupta - Princeton University
Arjun Prihar - Princeton University***IMECE**[®]**ONE GREAT LEARNING EXPERIENCE.**
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TECHNICAL SESSIONS

MONDAY, OCTOBER 31

12-11: Perspective on Fracture and Failure Mechanics**12-11-01: Perspective on Fracture and Failure Mechanics****4:00PM–5:45PM - CONVENTION CENTER, B244/B245****4:00PM**

Investigation of Fracture Behavior of Nuclear Graphite NBG-18 Using In-Situ Mechanical Testing Coupled With Micro-CT

Technical Presentation: IMECE2022-96280*Gongyuan Liu - The Pennsylvania State University**Yichun Tang - The Pennsylvania State University**Jing Du - The Pennsylvania State University**Aman Haque - The Pennsylvania State University***4:21PM**

Evaluation of Creep Properties for Modified 9cr-1mo Steel Based on Small Punch Test

Technical Presentation: IMECE2022-99838*Sangyeop Kim - Sungkyunkwan University**Uijeong Ro - Sungkyunkwan University**Yong Hwi Kim - Sungkyunkwan University**Moon Ki Kim - Sungkyunkwan University***4:42PM**

Effective Behavior of Peridynamic Random Structure Composites Subjected to Body Force With Compact Support

Technical Paper Publication: IMECE2022-95107*Valeriy Buryachenko - Micromechanics & Composites LLC***5:03PM**

A Non-Ordinary State-Based Peridynamic Computational Homogenisation Model by Considering Damage

Technical Presentation: IMECE2022-99616*Yakubu Kasimu Galadima - University of Strathclyde**Wenxuan Xia - University of Strathclyde**Erkan Oterkus - University of Strathclyde**Selda Oterkus - University of Strathclyde***IMECE**[®]

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TECHNICAL SESSIONS

TUESDAY, NOVEMBER 1

TUESDAY, NOVEMBER 1

12-08-01: Peridynamic Modeling of Materials' Behavior

10:15AM–12:00PM - CONVENTION CENTER, B242/B243

10:15AM

Modeling Crack Initiation and Propagation in Electrodeposition Processes via Peridynamics

Technical Presentation: IMECE2022-100080

Longzhen Wang - University of Nebraska-Lincoln

Florin Bobaru - University of Nebraska-Lincoln

10:36AM

Simulating Corrosion Damage in Crevices and From Galvanic Couples: Peridynamic Models: Part I

Technical Presentation: IMECE2022-100085

Florin Bobaru - University of Nebraska-Lincoln

Longzhen Wang - University of Nebraska-Lincoln

10:57AM

Plasticity and Ductile Failure Using the Fast Convolution-Based Method for Peridynamic Formulations

Technical Presentation: IMECE2022-100166

Farzaneh Mousavi - University of Nebraska-Lincoln

Siavash Jafarzadeh - The Pennsylvania State University

Florin Bobaru - University of Nebraska-Lincoln

11:18AM

The Fast Convolution-Based Method for the Peridynamic Form of Navier Stokes Equations

Technical Presentation: IMECE2022-100184

Chad Alexander - University of Nebraska-Lincoln

Florin Bobaru - University of Nebraska-Lincoln

11:39AM

Simulating Corrosion Damage in Crevices and From Galvanic Couples: Peridynamic Models: Part II

Technical Presentation: IMECE2022-100186

Florin Bobaru - University of Nebraska-Lincoln

Florin Wang - University of Nebraska-Lincoln

12-16: Drucker Medal Symposium

12-16-04: Drucker Medal Symposium

10:15AM–12:00PM - CONVENTION CENTER, A226

10:15AM

Data-Driven Design of Heterogenous Metamaterial Systems

Technical Presentation: IMECE2022-99590

Liwei Wang - Northwestern University

Wei Chen - Northwestern University

10:36AM

Optimally-Tailored Spinodal Architected Materials for Multiscale Design and Manufacturing

Technical Presentation: IMECE2022-99568

Fernando Vasconcelos da Senhora - Georgia Institute of Technology

Emily Sanders - Georgia Institute of Technology

Glauco H. Paulino - Princeton University

10:57AM

Understanding and Quantifying the Effect of Imperfections and Uncertainties in the Mechanical Behavior of Architected Materials



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TECHNICAL SESSIONS

TUESDAY, NOVEMBER 1

Technical Presentation: IMECE2022-99228*David Restrepo - The University of Texas at San Antonio**Juan David Navarro - The University of Texas at San Antonio**Juan Camilo Velasquez - 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***11:18AM****Harnessing the Emergent Behavior of Architected Materials: Bioinspiration and Beyond****Technical Presentation: IMECE2022-100043***Pablo Zavattieri - Purdue University***11:39AM****Smooth Crack Band Model (SCBM) With Multi-Element Front Eliminating Mesh Orientation Bias****Technical Presentation: IMECE2022-99375***Yupeng Zhang - Northwestern University**Hoang Nguyen - Northwestern University**Zdeněk Bažant - Northwestern University***12-22: Advances in Topology Optimization****12-22-01: Advances in Topology Optimization****10:15AM–12:00PM - CONVENTION CENTER, B244/B245****10:15AM****Risk-Averse Topology Optimization****Technical Presentation: IMECE2022-99380***Boyan Lazarov - Lawrence Livermore National Laboratory**Jingyi Wang - Lawrence Livermore National Laboratory**Brendan Keith - Lawrence Livermore National Laboratory***10:36AM****Fast Inaccurate Solves in Stochastic Programming for Topology Optimization With Many Load Cases****Technical Presentation: IMECE2022-100031***Eric De Sturler - Virginia Tech***10:57AM****Topology Optimization of Hard-Magnetic Soft Materials****Technical Presentation: IMECE2022-100109***Zhi Zhao - University of Illinois at Urbana-Champaign**Xiaojia Shelly Zhang - University of Illinois at Urbana-Champaign*

TECHNICAL SESSIONS

TUESDAY, NOVEMBER 1

11:18AM**Multimaterial Stress-Constrained Topology Optimization With Multiple Distinct Yield Criteria****Technical Presentation: IMECE2022-100110***Rahul Dev Kundu - University of Illinois at Urbana-Champaign**Weichen Li - University of Illinois at Urbana-Champaign**Xiaoja Shelly Zhang - University of Illinois at Urbana-Champaign***11:39AM****Generalizing De-Homogenization via Sawtooth-Function-Based Mapping in Data-Driven Topology Optimization****Technical Presentation: IMECE2022-100198***Liwei Wang - Northwestern University**Wei Chen - Northwestern University***12-7: Mechanics of Soft Materials****12-07-04: Mechanics of Soft Materials****1:30PM–3:15PM - CONVENTION CENTER, B242/B243****1:30PM****Direct Determination of the Stress Components During Hertzian Contact on a Soft Solid Using Photoelastic Tomography****Technical Presentation: IMECE2022-99794***Benjamin Mitchell - University of New Hampshire**Yuto Yokoyama - Tokyo University of Agriculture and Technology**Ali Nassiri - The Ohio State University**Yoshiyuki Tagawa - Tokyo University of Agriculture and Technology**Brad Kinsey - University of New Hampshire**Yannis Korkolis - The Ohio State University***1:51PM****Mechanical Properties of Wild-Type and Mutant Arabidopsis Thaliana Leaves****Technical Presentation: IMECE2022-99914***Bex Pendrak - Cornell University**Bella Burda - Cornell University**Adrienne Roeder - Cornell University**Meredith Silberstein - Cornell University***2:12PM****Constitutive Properties for Myelin Sheath****Technical Presentation: IMECE2022-99928***Fairuz Maliha - The University of Texas at Arlington**Ashfaq Adnan - The University of Texas at Arlington***2:33PM****Effect of Electrolyte on the Stress-Strain Behavior of Polymer Binder in Commercial Rechargeable Battery Electrode****Technical Presentation: IMECE2022-99935***Martina Borges - Michigan State University**Siva Nadimpalli - Michigan State University**Akshay Pakhare - Michigan State University***2:54PM****A Statistical Mechanics Framework for Polymer Chain Scission, Based on the Concepts of Distorted Bond Potential and Asymptotic Matching****Technical Presentation: IMECE2022-100042***Jason Mulderrig - Cornell University**Brandon Talamini - Lawrence Livermore National Laboratory**Nikolaos Bouklas - Cornell University*

TECHNICAL SESSIONS

TUESDAY, NOVEMBER 1

12-14: CONCAM Distinguished Lectures on Computational Mechanics**12-14-01: CONCAM Distinguished Lectures on Computational Mechanics****1:30PM–3:15PM - CONVENTION CENTER, A226****1:30PM****Progress in Peridynamics****Invited Presentation: IMECE2022-100115***Stewart Silling - Sandia National Laboratories***2:12PM****The Convergence of Simulation, AI, and HPC: Trends and Challenges****Invited Presentation: IMECE2022-99700***Uwe Schramm - Altair***2:54PM****Learning Integral (Nonlocal) Operators for Heterogeneous Material Modeling****Invited Presentation: IMECE2022-100015***Yue Yu - Lehigh University***12-16: Drucker Medal Symposium****12-16-05: Drucker Medal Symposium****1:30PM–3:15PM - CONVENTION CENTER, C160A****1:30PM****Optimally-Tailored Spinodal Architected Materials for Multiscale Design and Manufacturing****Technical Presentation: IMECE2022-99568***Fernando Vasconcelos da Senhora - Georgia Institute of Technology**Emily Sanders - Georgia Institute of Technology**Glaucio H. Paulino - Princeton University***1:51PM****A Highly Sensitive, Stretchable and Robust Strain Sensor Based on Crack Advancing and Opening****Technical Presentation: IMECE2022-99178***Shuang Wu - North Carolina State University**Yong Zhu - NCSU***2:12PM****Electromyogram-Based Lip-Reading via Unobtrusive Dry Electrodes and Machine Learning Methods****Technical Presentation: IMECE2022-99773***Penghao Dong - Stony Brook University**Yuanqing Song - Stony Brook University**Petar Djuric - Stony Brook University**Shanshan Yao - Stony Brook University***2:33PM****Kinetics of Phase Nucleation and Propagation in 2d Mote2****Technical Presentation: IMECE2022-99205***Wei Gao - Texas A&M University*

TECHNICAL SESSIONS

TUESDAY, NOVEMBER 1

12-19: Emerging Topology and Shape Optimization Techniques in Computational Design of Materials and Structures

12-19-01: Emerging Topology and Shape Optimization Techniques in Computational Design of Materials and Structures

1:30PM–3:15PM - CONVENTION CENTER, B244/B245

1:30PM

Method for Improved Alignment of Large Area, Unstructured Sandy Desert 3D Elevation Maps Acquired by Lidar Aerial Mapping With GNSS RTK Fixed GPS

Technical Paper Publication: IMECE2022-93324

Marko Bjelotomic - Dubai Electricity & Water Authority

Prashanth Subramaniam - Dubai Electricity & Water Authority

Mohamad Khalil - Dubai Electricity & Water Authority

Abdallah Nasir Abdo Mohammed - Dubai Electricity & Water Authority

Iraklis Nikolakakos - Dubai Electricity & Water Authority

Michael Weston - Dubai Electricity & Water Authority

Mohammed Minhas Anzil - Dubai Electricity & Water Authority

Khuloud Almaeeni - Dubai Electricity & Water Authority

1:51PM

Topology Optimization Through Deep Neural Network for Different Mechanical and Thermomechanical Problems

Technical Paper Publication: IMECE2022-94604

Md. Imrul Reza Shishir - The University of North Carolina at Charlotte

Alireza Tabarraei - The University of North Carolina at Charlotte

2:12PM

Multi-Objective Optimization of Composite Square Tube for Minimizing Peak Crushing Force and Maximizing Specific Energy Absorption Using Artificial Neural Network and Genetic Algorithm

Technical Paper Publication: IMECE2022-95023

Pradnya Zende - Indiana University–Purdue University Indianapolis

Hamid Dalir - Indiana University–Purdue University Indianapolis

2:33PM

Tunable Porous Electromagnetic Waveguide Structures Using Topology Optimization

Technical Presentation: IMECE2022-96208

Fariha Haque - The Ohio State University

Mohamad Al Nashar - The Ohio State University

Alok Sutradhar - The Ohio State University

12-7: Mechanics of Soft Materials

12-07-05: Mechanics of Soft Materials

3:30PM–5:15PM - CONVENTION CENTER, B242/B243

3:30PM

Nonlinear Snap-Through Dynamics of Internally-Pressurized Spherical Membranes Made of Photo-Cured Elastomers

Technical Presentation: IMECE2022-100044

Aditya Narkhede - Virginia Polytechnic Institute and State University

Xingsheng Sun - University of Kentucky

Kevin Wang - Virginia Polytechnic Institute and State University



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TECHNICAL SESSIONS

TUESDAY, NOVEMBER 1

3:51PM**Fluid-Structure Coupled Analysis and Design of Blast Mitigation Chambers****Technical Presentation: IMECE2022-93667***Aditya Narkhede - Virginia Polytechnic Institute and State University**Xingsheng Sun - University of Kentucky**Kevin Wang - Virginia Polytechnic Institute and State University***4:12PM****A Proof-of-Concept Study of a Novel Elasto-Hydrodynamic Seal for Gases****Technical Presentation: IMECE2022-94233***Karthik Reddy Lyathakula - North Carolina State University**Sevki Cesmeci - Georgia Southern University**Mohammad Fuad Hassan - Georgia Southern University**Shuangbiao Liu - Ultool, LLC**Hanping Xu - Ultool, LLC**Jing Tang - Ultool, LLC***4:33PM****Multiscale Failure Modeling of Hydride Embrittlement Zircaloy-4 Fuel Cladding****Technical Presentation: IMECE2022-100205***Jiayue Hu - Temple University**Ling Liu - Temple University***12-19: Emerging Topology and Shape Optimization Techniques in Computational Design of Materials and Structures****12-19-02: Emerging Topology and Shape Optimization Techniques in Computational Design of Materials and Structures****3:30PM–5:15PM - CONVENTION CENTER, B244/B245****3:30PM****Stiffener Size and Layout Design Using Level Set Topology Optimization and Inverse Isoparametric Mapping Algorithm****Technical Presentation: IMECE2022-99338***Wei Zhao - Oklahoma State University***3:51PM****Multi-Level Design of a Battery Packaging for Electrical Vehicles Using Multifunctional Composites****Technical Presentation: IMECE2022-99443***Reza Pejman - Drexel University**Jonathan Gorman - Drexel University**Ahmad Najafi - Drexel University***4:12PM****Neural Network Surrogates for Multiscale Structural Optimization****Technical Presentation: IMECE2022-99451***Nolan Black - Drexel University**Ahmad Najafi - Drexel University***4:33PM****A Highly Sensitive, Stretchable and Robust Strain Sensor Based on Crack Advancing and Opening****Technical Presentation: IMECE2022-99178***Shuang Wu - North Carolina State University**Yong Zhu - North Carolina State University***IMECE**[®]**ONE GREAT LEARNING EXPERIENCE.**
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TECHNICAL SESSIONS

WEDNESDAY, NOVEMBER 2

12-14: CONCAM Distinguished Lectures on Computational Mechanics**12-14-02: CONCAM Distinguished Lectures on Computational Mechanics****3:30PM–5:15PM - CONVENTION CENTER, A226****3:30PM****Leveraging Computational Mechanics to Predict Multifunctional Properties of Architected Materials****Invited Presentation: IMECE2022-100280***Damiano Pasini - McGill University***3:51PM****A Hybrid Mesh-Based/element-Free Method Using Fine-Scale Triangulations for the Solution of PDEs on Geometrically Complex Domains Without Defeaturing****Technical Presentation: IMECE2022-100283***Joseph Bishop - Sandia National Laboratories***4:12 PM****Manifold Learning for Plasticity****Invited Presentation: IMECE2022-100282***Waiching Sun - Columbia University***4:33PM****Chemo-Mechanical Coupling and Material Evolution in Finitely Deforming Solids Permeated With Reactive Fluids****Invited Presentation: IMECE2022-100281***Arif Masud - University of Illinois at Urbana-Champaign***WEDNESDAY, NOVEMBER 2****12-20: Instabilities in Solids and Structures****12-20-01: Instabilities in Solids and Structures****10:45PM–12:00PM - CONVENTION CENTER, B244/B245****10:45AM****Effective Elastic Behavior and Limit of Linearity of a 2d Triangular Periodic Lattice Under Macroscopic Strain State****Technical Presentation: IMECE2022-98157***Valentin Jeanneau - Institut de Recherche en Génie Civil et Mécanique (GeM)**Christelle Combescure - Institut de recherche Dupuy de Lôme**Marc Francois - Institut de Recherche en Génie Civil et Mécanique (GeM)***11:06AM****A Perturbation Method Solution of a Buckle Propagation Problem****Technical Presentation: IMECE2022-98988***Mikael Langthjem - Aarhus University**Henrik Myhre Jensen - Aarhus University***11:27AM****Stability and Localization of Deformation Delay in Finitely Strained Plates at Arbitrary Strain-Rates****Technical Presentation: IMECE2022-99253***Gyongang Wen - Ecole Polytechnique**Ryan Elliott - University of Minnesota**Krishnaswami Ravi-Chandar - The University of Texas Austin**Nicolas Triantafyllidis - Ecole Polytechnique*

TECHNICAL SESSIONS

WEDNESDAY, NOVEMBER 2

11:48AM

Spatial and Temporal Evolution of Localized Deformation in Niti Tubes in Constant Stress Thermal Cycles: Experiments and Analysis

Technical Presentation: IMECE2022-99363
Solon Tsimpoukis - University of Texas at Austin
Stelios Kyriakides - University of Texas at Austin

12:09PM

Snap-Through Instability of Tape-Springs Under Asymmetric Bending

Technical Presentation: IMECE2022-99529
Bowen Li - University of Central Florida
Kawai Kwok - University of Central Florida

12-20: Instabilities in Solids and Structures**12-20-02: Instabilities in Solids and Structures****2:00PM–3:45PM - CONVENTION CENTER, B244/B245****2:00PM**

Evolution of Lüders Induced Localization in Tubes Under Cyclic Bending

Technical Presentation: IMECE2022-99592
Weihan Zhang - The University of Texas at Austin
Stelios Kyriakides - The University of Texas at Austin

2:21PM

Mechanics Underpinning Phase Separation of Hydrogels

Technical Presentation: IMECE2022-99602
Yu Zhou - University of California, Los Angeles
Lihua Jin - University of California, Los Angeles

2:42PM

From Loss of Ellipticity to Localization in Soft Composites With Fiber Plasticity

Technical Presentation: IMECE2022-99672
Fernanda Fontenele - Cornell University
Nikolaos Bouklas - Cornell University
Michalis Agoras - University of Thessaly

3:03PM

Strength of Brittle Lattice Metamaterials

Technical Presentation: IMECE2022-99741
Enze Chen - Johns Hopkins University
Shengzhi Luan - Johns Hopkins University
Stavros Gaitanaros - Johns Hopkins University

3:24PM

Progressive Wrinkling and Collapse of Lined Pipe Due to Cyclic Bending

Technical Presentation: IMECE2022-99891
Emile Naous - The University of Texas at Austin
Stelios Kyriakides - The University of Texas at Austin

12-20: Instabilities in Solids and Structures**12-20-03: Instabilities in Solids and Structures****4:00PM–5:45PM - CONVENTION CENTER, B244/B245****4:00PM**

Buckling and Postbuckling of Hyperelastic Thick Tubes

Technical Presentation: IMECE2022-100104
Yu Zhou - University of California, Los Angeles
Yuzhen Chen - University of California, Los Angeles
Lihua Jin - University of California, Los Angeles



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TECHNICAL SESSIONS

THURSDAY, NOVEMBER 3

4:21PM

Accurate Predictions of the Compression Strength of Unidirectional Composites Using 3D X-Ray Scans and Non-Linear Finite Element Models

Technical Presentation: IMECE2022-100121

Lars Pilgaard Mikkelsen - DTU Wind and Energy Systems

4:42PM

Post-Buckling Behavior of Strain-Softening Hyperelastic Wide Columns

Technical Presentation: IMECE2022-100232

Shivam Agarwal - University of California, Los Angeles
Yuzhen Chen - University of California, Los Angeles
Lihua Jin - University of California, Los Angeles

5:03PM

Photo-Induced Spatiotemporal Bending of Shape Memory Polymers

Technical Presentation: IMECE2022-99461

Boliang Wu - University of California, Los Angeles
Tianzhen Liu - Southeast University
Yuzhen Chen - University of California, Los Angeles
Lihua Jin - University of California, Los Angeles

5:24PM

3D/4D Printing of Liquid Crystal Elastomers for Functional Applications

Technical Presentation: IMECE2022-99908

Xirui Peng - Georgia Institute of Technology
Devin Roach - Georgia Institute of Technology
H. Jerry Qi - Georgia Institute of Technology

THURSDAY, NOVEMBER 3

12-5: Data-Enabled Predictive Modeling, Scientific Machine Learning, and Uncertainty Quantification in Computational Mechanics

12-05-01: Data-Enabled Predictive Modeling, Scientific Machine Learning, and Uncertainty Quantification in Computational Mechanics

10:15AM–12:00PM - CONVENTION CENTER, B235

10:15AM

Prediction of Atomic Stress Fields in Complex Multimaterial Composites Using Cycle-Consistent Adversarial Neural Networks Based on Unpaired and Unmatched Sparse Datasets

Technical Presentation: IMECE2022-93977

Markus Buehler - Massachusetts Institute of Technology

10:36AM

A Physics-Based Data-Driven Approach for Modeling of Environmental Degradation in Elastomers

Technical Paper Publication: IMECE2022-95000

Aref Ghaderi - Michigan State University
Yang Chen - Michigan State University
Roosbeh Dargazany - Michigan State University

10:57AM

Uncertainty Quantification on Galvanic Corrosion Based on Adaptive Based Surrogate Modeling

Technical Paper Publication: IMECE2022-95333

Parth Bansal - University of Illinois
Zhuoyuan Zheng - University of Illinois at Urbana-Champaign
Yumeng Li - University of Illinois at Urbana-Champaign



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TECHNICAL SESSIONS

THURSDAY, NOVEMBER 3

11:18AM

A Machine Learning Framework for Predictive Modeling of Tumor Growth With Quantified Uncertainty

Technical Presentation: IMECE2022-95435

Baoshan Liang - University at Buffalo

Jingye Tan - University at Buffalo

Danial Faghihi - University at Buffalo

11:39AM

Modeling the Burning of Polymer Matrix: Training Collocation Physics-Informed Neural Network

Technical Paper Publication: IMECE2022-95456

Aref Ghaderi - Michigan State University

Roozbeh Dargazany - Michigan State University

12-4: Multiscale Models and Experimental Techniques for Composite Materials and Structures

12-04-01: Multiscale Models and Experimental Techniques for Composite Materials and Structures

10:15AM–12:00PM - CONVENTION CENTER, B230/B231

10:15AM

Investigation of Crashworthiness of Electric Vehicle's Battery Enclosure Made by Carbon Fiber Organosheets Using Finite Element Analysis

Technical Presentation: IMECE2022-91702

Shank Kulkarni - Pacific Northwest National Laboratory

Mohammod Taufique - Pacific Northwest National Laboratory

Forrest Hale - Pacific Northwest National Laboratory

Arnaud Dereims - ESI North America

Ramesh Dwarampudi - ESI North America

Ram Devanathan - Pacific Northwest National Laboratory

10:36AM

Transformation Field Analysis in the Self-Consistent Clustering Discretization Method in Micromechanics of Composites

Technical Paper Publication: IMECE2022-95138

Michael Braginsky - University of Dayton Research Institute

Valeriy Buryachenko - Micromechanics & Composites LLC

10:57AM

Towards Verification and Validation of Modeling Dyneema Using the Embedded Finite Element Method

Technical Paper Publication: IMECE2022-96784

Valerie Martin - The Pennsylvania State University

Thomas Hannah - The Pennsylvania State University

Stephen Ellis - Los Alamos National Laboratory

Reuben Kraft - The Pennsylvania State University

11:18AM

Integrated Computational Framework for Modeling Chopped Fiber and Woven Composites

Technical Presentation: IMECE2022-98933

PENGFEI ZHANG - The Ohio State University

Ming Yang - The Ohio State University

Salil Pai - The Ohio State University

Soheil Soghrati - The Ohio State University

11:39AM

Adaptive Eigendeformation-Based Reduced-Order Homogenization Model for Composite Materials

Technical Presentation: IMECE2022-100055

Min Lin - University of Wyoming

David Brandyberry - University of Illinois at Urbana-Champaign

Xiang Zhang - University of Wyoming



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TECHNICAL SESSIONS

THURSDAY, NOVEMBER 3

12-1: Fracture and Failure of Reinforced Polymer Matrix Composite Materials**12-01-01: Fracture and Failure of Reinforced Polymer Matrix Composite Materials****10:15AM–12:00PM - CONVENTION CENTER, B234****10:15AM****Effect of Metallic Insert Design Parameters on the Load-Carrying Capacity of GFRP Bolted Connection****Technical Paper Publication: IMECE2022-93382**

Amr Elbsheshy - The British University in Egypt
Mahmoud Ali - The British University in Egypt
Mostafa Shazly - The British University in Egypt
Yehia Bahei-El-Din - The British University in Egypt

10:36AM**Characterization of 3D Printed Single Filament Carbon Fiber Epoxy Composite****Technical Paper Publication: IMECE2022-94861**

Anirban Mondal - University of Oklahoma
Mrinal Saha - University of Oklahoma
Kuntal Maity - University of Oklahoma
M. Cengiz Altan - University of Oklahoma
Yingtao Liu - University of Oklahoma

10:57 AM**A Novel Discrete, Mesoscale Modeling Framework for the Simulation of the Damaging and Fracturing Behavior of Composites****Technical Paper Publication: IMECE2022-95617**

Marco Salviato - University of Washington, Department of Aeronautics and Astronautics
Sean Phenisee - University of Washington
Antonio Deleo - University of Washington
Daniele Pelessone - ES3 Inc.
Mark Flores - Air Force Research Laboratory

11:18AM**A Study on the Adhesively Bonded 3d Metal Printed Parts With Embedded Sensors Under Ballistic Shear Impact****Technical Presentation: IMECE2022-99858**

Gizem Derya Demir - The City College of New York
Micheal Jacobson - The City College of New York
Adifet Cejovic - The City College of New York
Sumit Das - The City College of New York
Salih Yildiz - The City College of New York

12-18: Functional Origami and Kirigami-Inspired Structures and Metamaterials**12-18-01: Functional Origami and Kirigami-Inspired Structures and Metamaterials****10:15AM–12:00PM - CONVENTION CENTER, B244/B245****10:15AM****Nonlinear Stability Analysis of a Reconfigurable Origami-Inspired Structure****Technical Paper Publication: IMECE2022-95190**

Mojtaba Moshtaghzadeh - Florida International University
Ali Bakhtiari - Florida International University
Pezhman Mardanpour - Florida International University

10:36AM**Origami-Based Metamaterials: Mechanics and Devices****Technical Presentation: IMECE2022-95289***Hanqing Jiang - Westlake University*

TECHNICAL SESSIONS

THURSDAY, NOVEMBER 3

10:57AM**Utilizing Bilayer Shrinkage to Assemble Complex Ceramic Shapes****Technical Paper Publication: IMECE2022-95531***Alexander Hartwell - Syracuse University
Nathaniel Slabaugh - Syracuse University
Jeongmin Ahn - Syracuse University***11:18AM****Reconfigurability and Tunability of Mechanical Metamaterials Based on Tachi-Miura Polyhedron****Technical Presentation: IMECE2022-99301***Koshiro Yamaguchi - University of Washington
Jinkyu Yang - University of Washington***11:39AM****Multi-Stable Origami Corrugated Tubes With Self-Stiffening****Technical Presentation: IMECE2022-99329***Zhongyuan Wo - The University of Michigan
Evgeni Filipov - The University of Michigan***12-15: Dynamic Failure of Materials & Structures****12-15-01: Dynamic Failure of Materials & Structures****10:15AM–12:00PM - CONVENTION CENTER, B242/B243****10:15AM****Directionally Controlled Impact-Debris Propagation of Origami-Inspired Composite Panels****Technical Presentation: IMECE2022-100182***Nathan Hoch - Utah State University
Chase Mortensen - Utah State University
Juhyeong Lee - Utah State University***10:36AM****Mixed Mode Dynamic Fracture Behavior of Soda Lime Glass****Technical Presentation: IMECE2022-99364***Hareesh Tippur - Auburn University
Sivareddy Dondeti - Auburn University***10:57AM****A Study of Multilayer Composite Armor****Technical Paper Publication: IMECE2022-94755***Shah Alam - Texas A&M University
Diem Nguyen - Texas A&M University -Kingsville
Ma Wahab - Louisiana State University***11:18AM****Molecular Dynamics Simulation of Ultrahigh-Molecular-Weight Polyethylene Under High-Speed Impact****Technical Paper Publication: IMECE2022-94754***Shah Alam - Texas A&M University
Guodong Guo - Texas A&M University–Kingsville***11:39AM****Exploring Alternative Methods for Simulating Lightning Mechanical Damage Effects on Carbon/Epoxy Laminates****Technical Paper Publication: IMECE2022-88057***Juhyeong Lee - Utah State University
Bin Yang - Tongji University
Kunkun Fu - Tongji University*

TECHNICAL SESSIONS

THURSDAY, NOVEMBER 3

12-6: Data-Driven Modeling and Simulation for Computational Biomedicine**12-06-01: Data-Driven Modeling and Simulation for Computational Biomedicine****2:00PM–3:45PM - CONVENTION CENTER, B230/B231****2:00PM****Deep Learning for Biomateriomics Using Neural Ologs****Technical Presentation: IMECE2022-93974***Markus Buehler - Massachusetts Institute of Technology***2:21PM****Towards Planning Cardiac Surgery Using Personalized Computational Modeling****Technical Presentation: IMECE2022-94111***Vijay Vedula - Columbia University***2:42PM****Biventricular Statistical Shape Atlas of Unloaded Reference Geometries: A Novel Method to Control for Hemodynamic Variations in End-Diastolic Pressure****Technical Paper Publication: IMECE2022-94229***Brendan Crabb - University of California, San Diego**Sachin Govil - University of California, San Diego**Sanjeet Hegde - University of California, San Diego**James Perry - University of California, San Diego**Alistair Young - King's College London**Jeffrey Omens - University of California, San Diego**Hyoung Kim - University of California San, Diego**Daniela Valdez-Jasso - University of California San, Diego**Francisco Contijoch - University of California, San Diego***3:03PM****Modeling Single Ventricle Morphology With an HLHS-Specific Biventricular Template to Enhance Statistical Shape and Biomechanics Analysis****Technical Paper Publication: IMECE2022-95115***Renxiang Tang - University of California San Diego**Sachin Govil - University of California San Diego**Charlène Mauger - University of Auckland**Sanjeet Hegde - Rady Children's Hospital San Diego**Jeffery Omens - University of California San Diego**James Perry - Rady Children's Hospital San Diego**Andrew Mcculloch - University of California San Diego***3:24PM****High-Order Advancing Front Mesh Generation From Medical Images for Biomechanics Applications****Technical Presentation: IMECE2022-97085***Fariba Mohammadi - University of Kansas**Suzanne Shontz - University of Kansas**Cristian Linte - Rochester Institute of Technology***12-1: Fracture and Failure of Reinforced Polymer Matrix Composite Materials****12-01-02: Fracture and Failure of Reinforced Polymer Matrix Composite Materials****2:00PM–3:45PM - CONVENTION CENTER, B234****2:00PM****Load-Dependent Optimal Eigendeformation-Based Multiscale Reduced-Order Homogenization Model for Polymer Composites Under Volumetric and Interfacial Damage****Technical Presentation: IMECE2022-100076***Min Lin - University of Wyoming**David Brandyberry - University of Illinois at Urbana-Champaign**Xiang Zhang - University of Wyoming*

TECHNICAL SESSIONS

THURSDAY, NOVEMBER 3

2:21PM**Size Effects on Quasi-Static Compression Response of Foldcore Sandwich Composites****Technical Presentation: IMECE2022-100101***Chase Mortensen - Utah State University**Nathan Hoch - Utah State University**Juhyeong Lee - Utah State University***2:42PM****Deep Learning-Based Approach for Predicting Effects of Microvoids on Stress Field and Crack Pattern in Fiber-Reinforced Composite Materials****Technical Presentation: IMECE2022-100105***Jiayue Hu - Temple University**Mailun Zhang - George Mason University***3:03PM****Deep Learning-Based Approach for Predicting Microvoids Effects on Stress Field and Crack Pattern in Fiber-Reinforced Composite Materials****Technical Presentation: IMECE2022-100210***Jiayue Hu - Temple University**Ling Liu - Temple University***3:24PM****Finite Element Analysis of Stress Propagation in Meso Structure of Low-Density Porous Material****Technical Paper Publication: IMECE2022-89158***Ryotaro Ogawa -**Kyoto Institute of Technology**Hikaru Miyaki -**Kyoto Institute of Technology**Atsushi Sakuma -**Kyoto Institute of Technology***12-18: Functional Origami and Kirigami-inspired Structures and Metamaterials****12-18-02: Functional Origami and Kirigami-inspired Structures and Metamaterials****2:00PM–3:45PM - CONVENTION CENTER, B244/B245****2:00PM****Sensing Through the Origami Body: An Mechano-Intelligent Task of Input Signal and Payload Identification****Technical Presentation: IMECE2022-99632***Jun Wang - Virginia Polytechnic Institute and State University**Suyi Li - Virginia Polytechnic Institute and State University***2:21PM****Bifurcation Instructed Design of Magneto Elastic Machines****Technical Presentation: IMECE2022-99857***Itay Griniasty - Cornell University**Itai Cohen - Cornell University**James Sethna - Cornell University**David Hathcock - Cornell University**Teaya Yang - Cornell University**Yuchao Chen - Cornell University***2:42PM****Origami Inverse Design With Machine Learning****Technical Presentation: IMECE2022-99975***Yi Zhu - University of Michigan**Evgueni Filipov - University of Michigan*

TECHNICAL SESSIONS

THURSDAY, NOVEMBER 3

3:03PM**The Poisson Coefficient and the Self-Equilibrium Geometry of Origami Pillars****Technical Presentation: IMECE2022-100156***Hussein Nassar - University of Missouri
Arthur Lebéé - Ecole des Ponts***3:24PM****Curved Crease Origami for Functional Shape-Morphing Structures****Technical Presentation: IMECE2022-100228***Evgueni Filipov - University of Michigan
Steven Woodruff - University of Michigan
Hardik Patil - University of Michigan***12-5: Data-Enabled Predictive Modeling, Scientific Machine Learning, and Uncertainty Quantification in Computational Mechanics****12-05-02: Data-Enabled Predictive Modeling, Scientific Machine Learning, and Uncertainty Quantification in Computational Mechanics****2:00PM–3:45PM - CONVENTION CENTER, B235****2:00PM****CNN-Based Surrogate for the Phase Field Damage Model: A Study on Its Generalization Across Microstructure Parameters for Composite Materials****Technical Presentation: IMECE2022-97070***Yuxiang Gao - Vanderbilt University
Matthew Berger - Vanderbilt University
Ravindra Duddu - Vanderbilt University***2:21PM****Deep Learning Accelerated Topology Optimization With Inherent Control of Image Quality****Technical Presentation: IMECE2022-99024***Md. Mohaiminul Islam - Temple University
Ling Liu - Temple University***2:42PM****Calibrating Constitutive Models With Full-Field Data via Physics Informed Neural Networks****Technical Presentation: IMECE2022-99105***Craig Hamel - Sandia National Laboratories
Sharlotte Kramer - Sandia National Laboratories
Kevin Long - Sandia National Laboratories***3:03PM****Recurrent Localization Networks Applied to the Lippmann-Schwinger Equation****Technical Presentation: IMECE2022-99998***Conlain Kelly - Georgia Institute of Technology
Surya Kalidindi - Georgia Institute of Technology***3:24PM****Data-Driven Creep Simulation Based on Gaussian Process Regression for 9% Cr Steel****Technical Presentation: IMECE2022-99285***Uijeong Ro - Sungkyunkwan University
Sangyeop Kim - Sungkyunkwan University
Yonghwi Kim - Sungkyunkwan University
Taeksang Lee - Myongji University
Moon Ki Kim - Sungkyunkwan University***12-21: General: Mechanics of Solids, Structures, and Fluids****12-21-01: General: Mechanics of Solids, Structures, and Fluids****2:00PM–3:45PM - CONVENTION CENTER, B242/B243****IMECE**[®]**ONE GREAT LEARNING EXPERIENCE.**
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TECHNICAL SESSIONS

THURSDAY, NOVEMBER 3

2:00PM**Finite Element Analysis of the Critical Buckling Load in Hollow Microneedles With Lateral Support****Technical Paper Publication: IMECE2022-94699***Biswas Poudel - Embry-Riddle Aeronautical University
Istemi Ozsoy - Embry-Riddle Aeronautical University***2:21 PM****Numerical Simulation of Aged Reinforced Concrete Column Nonlinear Creep Due to High Sustained Loading****Technical Paper Publication: IMECE2022-94840***Wenchen Ma - Phasor Engineering LLC***2:42PM****High Stability Superhydrophobic Surfaces****Technical Presentation: IMECE2022-96029***Zirui Liu - University of Windsor
Vesselin Stoilov - University of Windsor***12-21: General: Mechanics of Solids, Structures and Fluids****12-21-02: General: Mechanics of Solids, Structures and Fluids****4:00PM–5:45PM - CONVENTION CENTER, B242/B243****4:00PM****Implantable, Wireless, Self-Fixing Thermal Sensors for Continuous Measurements of Microvascular Blood Flow in Flaps and Organ Grafts****Technical Presentation: IMECE2022-99271***Shupeng Li - Northwestern University
Yonggang Huang - Northwestern University***4:21PM****A New Crystal Plasticity Modeling Framework for Fully Implicit Time Integration of Coupled Phase Transformation and Slip in Shape Memory Alloys****Technical Presentation: IMECE2022-99442***Rupesh Kumar Mahendran - Georgia Institute of Technology
Surya R Kalidindi - Georgia Institute of Technology
Aaron Stebner - Georgia Institute of Technology
Aditya Venkatraman - Georgia Institute of Technology***4:42PM****Advanced Capabilities of the Conforming to Interface Structured Adaptive Mesh Refinement (CISAMR) for Modeling Complex Material Microstructures****Technical Presentation: IMECE2022-99297***Salil Pai - The Ohio State University
Anand Nagarajan - The Ohio State University
Mohamad Mohamadsalehi - The Ohio State University
Balavignesh Vemparala - The Ohio State University
Mingshi Ji - The Ohio State University
Soheil Soghrati - The Ohio State University***5:03PM****Correcting for DIC Speckle Pattern Inversion at High Temperature Using Color Cameras****Technical Presentation: IMECE2022-100247***Ryan Berke - Utah State University
Lindsey Rowley - Utah State University
Prasenjit Dewanjee - Utah State University
Thin Thai - Van Lang University***12-3: Mechanics and Design of Cellular Materials****12-03-01: Mechanics and Design of Cellular Materials****4:00PM–5:45PM - CONVENTION CENTER, B234****IMECE**[®]**ONE GREAT LEARNING EXPERIENCE.**
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TECHNICAL SESSIONS

THURSDAY, NOVEMBER 3

4:00PM**Cellular Core Square Tube Crushing Analysis With Induced Folding Mechanisms****Technical Paper Publication: IMECE2022-94847***Sean Jenson - Ohio University**Muhammad Ali - Ohio University***4:21PM****Crushing Analysis of Square Tube With Fluid and Foam-Filled Cellular Core****Technical Paper Publication: IMECE2022-94852***Sean Jenson - Ohio University**Muhammad Ali - Ohio University***4:42PM****Effective Elastic Behavior and Limit of Linearity of a 2D Triangular Periodic Lattice Under Macroscopic Strain State****Technical Presentation: IMECE2022-95553***Valentin Jeanneau - Nantes Université**Christelle Combescure - Académie de Coëtquidan**Marc Francois - Nantes Université***5:03PM****Cellular Lattices With Struts and Plates****Technical Paper Publication: IMECE2022-95942***Nandika Dsouza - University of North Texas**Mahan Ghosh - University of North Texas***5:24PM****Performance Evaluation of Novel “Lighter-Yet-Effective” Helmet Materials Fabricated Using Additive Manufacturing and Digital Materials****Technical Presentation: IMECE2022-99919***Justin Marino - The University of Texas at Arlington**Layth Ahmad - The University of Texas at Arlington**Lauren Hutchison - The University of Texas at Arlington**Ashfaq Adnan - The University of Texas at Arlington***12-5: Data-Enabled Predictive Modeling, Scientific Machine Learning, and Uncertainty Quantification in Computational Mechanics****12-05-03: Data-Enabled Predictive Modeling, Scientific Machine Learning, and Uncertainty Quantification in Computational Mechanics****4:00PM****Hybrid Elastoplasticity With Data-Driven Yielding and Model-Based Hardening****Technical Presentation: IMECE2022-100019***Jan Niklas Fuhg - Cornell University**Nikolaos Bouklas - Cornell University***4:21PM****Obtaining All Material Sensitivities From a Single Simulation of a Computational Model****Technical Presentation: IMECE2022-100081***Joseph Carter - Brigham Young University**Christopher Stubbs - Fairleigh Dickinson University**Douglas Cook - Brigham Young University***4:42PM****Deep Learning of Complex Material Distribution Patterns During Neural Material Transport****Technical Presentation: IMECE2022-93706***Yongjie Jessica Zhang - Carnegie Mellon University**Angran Li - Carnegie Mellon University***5:03PM****Discovery of Signaling Mechanisms in Cell Migration by Data Driven Variational System Identification and Inverse Reinforcement Learning****Technical Presentation: IMECE2022-94841***Krishna Garikipati - University of Michigan***IMECE**[®]**ONE GREAT LEARNING EXPERIENCE.**
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TECHNICAL SESSIONS

12-17: Computational Methods in Heterogeneous Porous Media

12-17-01: Computational Methods in Heterogeneous Porous Media

4:00PM–5:45PM - CONVENTION CENTER, B230/B231

4:00PM

Steady Vibration Problems of the Linear Coupled Theory of Thermoelasticity for Materials With Double Porosity

Technical Presentation: IMECE2022-94067

Merab Svanadze - Ilia State University

4:21PM

Porosity-Damage Phase Field Damage Models for Hydraulic Fracture Propagation in Glaciers and Ice Shelves

Technical Presentation: IMECE2022-97114

Ravindra Duddu - Vanderbilt University

Theo Clayton - Imperial College London

Emilio Martinez-Paneda - Imperial College London

4:42PM

Multiscale Topology Optimization of Flow Problems in Porous Media Using Neural Networks

Technical Presentation: IMECE2022-99749

Mathias Schmidt - Lawrence Livermore National Laboratory

Boyan Lazarov - Lawrence Livermore National Laboratory

John Boerchers - Lawrence Livermore National Laboratory

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

Sponsored by the Microelectromechanical Systems Division

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: PowerMEMS
- 13-9: Advanced Manufacturing of Microsystems, Microstructures, and Miniaturized Actuators
- 13-10: Microfluidics 2022
- 13-11: Inertial Navigation: MEMS/NEMS to Bio-Inspired

ACKNOWLEDGMENT TRACK ORGANIZERS

Track Organizer: Gregory Hader

Track Co-Organizer: Uttam Chakravarty

TOPIC ORGANIZERS

Adam Huang, University of Arkansas

Ahsan Mian, Wright State University

Amir Ali Amiri Moghadam, Kennesaw State University

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



TECHNICAL SESSIONS

WEDNESDAY, NOVEMBER 2

Grzegorz Hader, U.S. Army Combat Capabilities Development Command, Armaments Center

Ibrahim A. Alhomoudi, National Center for Nanotechnology and Advance Materials, Materials Science Research Institute, King Abdulaziz City for Science and Technology (KACST)

In-Hyook Song, Texas State University

Ioana Voiculescu, City College of New York

Luis Fonseca, Institute of Microelectronics of Barcelona

Mehdi Salek, Massachusetts Institute of Technology

Ming-Tsang Lee, National Tsing Hua University

Namwon Kim, Texas State University

Nathan Jackson, University of New Mexico

Nazmul Islam, University of Texas Rio Grande Valley

Rasim Guldiken, University of South Florida

Seyedhamidreza Alaie, New Mexico State University

Uttam Kumar Chakravarty, University of New Orleans

Wei Xue, Rowan University

SESSION ORGANIZERS

Ahsan Mian - Wright State University

Alex Bae, Eastern Washington University

Amir Ali Amiri Moghadam - Kennesaw State University

Daniel Kaplan - U.S. Army Combat Capabilities Development Command Armaments Center

Grzegorz (Greg) Hader - U.S. Army Combat Capabilities Development Command Armaments Center

In-Hyook Song - Texas State University

Ioana Voiculescu - The City College of New York

Jalal Ahamed, University of Windsor

Mohammad Mehdi Salek - ETH Zürich

Nicole Hashemi - Iowa State University

Po-hao Huang - University of Arkansas

Rasim Guldiken - University of South Florida

Seyedhamidreza Alaie - New Mexico State University

Uttam Chakravarty - The University of New Orleans

TRACK 13

WEDNESDAY, NOVEMBER 2

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

Wednesday, November 2, 9:45AM-10:30AM

Room: A226

Greater Columbus Convention Center

Title: Quantification of the interaction of a streamwise vortex with an oblique shock wave at Supersonic Flows

Dr. Edward DeMauro
Rutgers University

13-1: General Topics of MEMS/NEMS

13-01-01: Design and Fabrication, Analysis, Processes, and Technology for Micro and Nano Devices and Systems

10:45AM–12:30PM - CONVENTION CENTER, B230/B231

10:45AM

Effect of SF₆ and C₄F₈ Flow Rate on Etched Surface Profile and Grass Formation in Deep Reactive Ion Etching Process

Technical Paper Publication: IMECE2022-92967

Pallavi Sharma - The University of New Mexico

Matthias Pleil - The University of New Mexico

Nathan Jackson - The University of New Mexico

11:06AM

Improvement of the Sensitivity and Selectivity of Gas Molecules of Graphene-Base Gas Sensor With Carbon Nanotubes Under the Application of Strain

Please note: This program is accurate as of September 2022. Visit the IMECE App for the latest information on the technical program.



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TECHNICAL SESSIONS

WEDNESDAY, NOVEMBER 2

Technical Paper Publication: IMECE2022-95307

Yuto Hirose - Tohoku University
Xiangyu Qiao - Tohoku University
Wangyang Fu - Tsinghua University
Ken Suzuki - Tohoku University
Hideo Miura - Tohoku University

11:27AM**Feasibility Study of Manufacturing 3D Microchannels Using 3D Printing and Bonding****Technical Presentation: IMECE2022-95512**

Daniel Park - Louisiana State University
Jagannath Upadhyay - SUNY Polytechnic Institute
Dimitris Nikitopoulos - Louisiana State University

11:48AM**Thermal Fusion Bonding With a Pressure-Assisted Boiling Point High Pressure System for Solid Phase Extraction Microfluidic Devices****Technical Presentation: IMECE2022-95734**

Daniel Park - Louisiana State University
S. Cho - Kyungnam University
Taehyun Park - Kyungnam University
Steven Soper - University Kansas
Michael Murphy - Louisiana State University

13-1: General Topics of MEMS/NEMS**13-01-02: Design and Fabrication, Analysis, Processes, and Technology for Micro and Nano Devices and Systems****2:00PM–3:45PM - CONVENTION CENTER, B230/B231****2:00PM****Graphene-Conductive Polymer-Based Electrochemical Sensor for Dopamine Detection****Technical Paper Publication: IMECE2022-96193**

Dipannita Ghosh - The University of Texas Rio Grande Valley
Md. Ashiqur Rahman - The University of Texas Rio Grande Valley
Ali Ashraf - The University of Texas Rio Grande Valley
Nazmul Islam - The University of Texas Rio Grande Valley

2:21PM**Acoustic Pressure Analysis of Capacitive Micromachined Ultrasonic Transducer Devices****Technical Presentation: IMECE2022-96904**

Kendalle Howard - Texas State University
Byoung Hee You - Texas State University
Jeong Tae Ok - Wright State University
In-Hyook Song - Texas State University

2:42PM**Machine Learning Classifiers for Nanoscale Characterization of Metal-Loaded Aerogel Catalytic Architectures****Technical Presentation: IMECE2022-98792**

Todd Brintlinger - U.S. Naval Research Laboratory
Ashley Pennington - U.S. Naval Research Laboratory
Travis Novak - U.S. Naval Research Laboratory
Catherine Pitman - U.S. Naval Research Laboratory
Paul De Sario - U.S. Naval Research Laboratory
Debra Rolison - U.S. Naval Research Laboratory

3:03PM**Long-Term Effect of UV/ozone Treated Pmma Surface Properties****Technical Presentation: IMECE2022-99482**

GeunDong Bae - Kyungnam University
In-Hyook Song - Texas State University
Taehyun Park - Kyungnam University

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TECHNICAL SESSIONS

WEDNESDAY, NOVEMBER 2

13-4: Applications of Micro and Nano Systems in Medicine and Biology**13-04-01: Applied Mechanics and Materials in Micro- and Nano-Systems****4:00PM–5:45PM - CONVENTION CENTER, B230/B231****4:00PM****An Investigation on the Aerodynamics, Vibrations, and Control of an Electroactive Membrane****Technical Paper Publication: IMECE2022-94540***Oluwatosin Ojo - The University of New Orleans**Mohammed Khairul Habib Pulok - The University of New Orleans**Ji Su - NASA Langley Research Center**Uttam K Chakravarty - The University of New Orleans***4:21PM****An Investigation on a Novel Soft Metamaterial for Space Applications****Technical Paper Publication: IMECE2022-94719***Mohammad Khairul Habib Pulok - The University of New Orleans**Pratik Sarker - Embry-Riddle Aeronautical University**Uttam K. Chakravarty - The University of New Orleans***4:42PM****Matrix Pattern Micromarkers for Tracking Local Contractile Movements of Myotubes Cultured on Thin-Film Scaffold****Technical Paper Publication: IMECE2022-94760***Shigehiro Hashimoto - Kogakuin University**Shusei Sakai - Kogakuin University***5:03PM****Local Strain Modification Effects on Global Properties of AlGaIn/GaN High Electron Mobility Transistors****Technical Presentation: IMECE2022-95062***Nahid Sultan Al-Mamun - The Pennsylvania State University**Aman Haque - The Pennsylvania State University***13-5: Micro and Nano Devices****13-05-01: Advanced Manufacturing of Microsystems, Microstructures, and Miniaturized Actuators****4:00PM–5:45PM - CONVENTION CENTER, B230/B231****4:00PM****Investigating the Effects of Solvents and Nanocomposite on Tailoring Elastic Modulus Piezoelectric Thin Film PVDF-TrFE****Technical Paper Publication: IMECE2022-95576***Deepak Kunwar - University of New Mexico**Md. Mehadi Hassan - University of New Mexico**Nathan Jackson - University of New Mexico***4:21PM****Micrometer-Sized, Electrically Morphing Metamaterial Robots****Technical Presentation: IMECE2022-99910***Qingkun Liu - Cornell University**Wei Wang - Cornell University**Himani Sinhmar - Cornell University**Itay Griniasty - Cornell University**Jacob Pelster - Cornell University**Michael Reynolds - Cornell University**Hadas Kress-Gazit - Cornell University**Paul Mceuen - Cornell University**Itai Cohen - Cornell University***IMECE**[®]**ONE GREAT LEARNING EXPERIENCE.**
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TECHNICAL SESSIONS

THURSDAY, NOVEMBER 3

4:42PM

Fabrication of Miniaturized Nitinol Structures With Complex Topology Using Sacrificial Copper Fixture and 3D Printed Polymeric Fixtures With Applications in Medical Devices

Technical Presentation: IMECE2022-100223

*Seyedhamidreza Alaie - New Mexico State University
Hemanta Dulal - New Mexico State University
Subhi Al'aref - University of Arkansas for Medical Sciences*

5:03PM

Hexagonal Microcavities With Hexagonal Lattices Embedded in Sub-Mm Thick Films and Their Failure Mechanisms

Technical Presentation: IMECE2022-100248

*Hemanta Dulal - New Mexico State University
Subhi Al'aref - University of Arkansas for Medical Sciences
Seyedhamidreza Alaie - New Mexico State University*

5:24PM

Lateral and Transverse Movable Mass Impacts on Bandwidth of Kinetic Energy Harvesters

Technical Paper Publication: IMECE2022-94231

Nathan Jackson - The University of New Mexico

THURSDAY, NOVEMBER 3

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

Thursday, November 3, 9:15AM-10:00AM

Room: A212/A213

Greater Columbus Convention Center

Title: Towards Scalable 2D Electronic Materials

Dr. Nicholas Glavin

Air Force Research Laboratory

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

13-02-01: Applications of Micro and Nano Systems in Medicine and Biology

10:15AM–12:00PM - CONVENTION CENTER, A222

10:15AM

Piezoelectric Bi-Layer Waveguide on Quartz Saw Device for Liquid Sensing

Technical Paper Publication: IMECE2022-94349

*Kun-Lin Lee - The City College of New York
Glen Kowach - The City College of New York
Ioana Voiculescu - The City College of New York*

10:36AM

Wearable and Stretchable Piezoelectric Power Generator Based on Thin Film of ZnO

Technical Paper Publication: IMECE2022-94353

*Ioana Voiculescu - The City College of New York
Shuo Fang - The City College of New York
Fang Li - New York Institute of Technology*



TECHNICAL SESSIONS

THURSDAY, NOVEMBER 3

10:57AM**Microfluidic Devices for Isolating and Releasing Disseminated Tumor Cells in Bone Marrow****Technical Paper Publication: IMECE2022-94554**

Minh-Chau Le - University of Florida
Dongjiang Chen - University of Florida
Kierstin Smith - University of Florida
David Tran - University of Florida
Z. Hugh Fan - University of Florida

11:18AM**Strain-Induced Change of Adsorption Behaviour of Gas Molecules on Graphene Analyzed by Density Functional Method****Technical Paper Publication: IMECE2022-94892**

Meng Yin - Tohoku University
Xiangyu Qiao - Tohoku University
Qinqiang Zhang - Tohoku University
Ken Suzuki - Tohoku University
Lei Wang - University of Science and Technology Beijing

13-3: Computational Studies on MEMS and Nanostructures**13-03-01: Micro and Nano Devices****10:15AM–12:00PM - CONVENTION CENTER, A223****10:15AM****Cost-Effective Soft Actuators Using Nafion and Carbon Nanotube Electrodes****Technical Paper Publication: IMECE2022-95669**

Benjamin Wechter - Rowan University
Nicholas Gushue - Rowan University
Luke Reilly - Rowan University
Max Rutka - Rowan University
Ryan Kennedy - Rowan University
Jacob Mahon - Rowan University
Wei Xue - Rowan University
Mitja Trkov - Rowan University

10:36AM**A Closed Loop Pressure Assisted Boiling Point (PABP) Control System for Thermal Fusion Bonding of Thermoplastics****Technical Paper Publication: IMECE2022-96219**

Kavya Dathathreya - The Ohio State University
Daniel S. Park - Louisiana State University
Taehyun Park - Kyungnam University
Steven A Soper - The University of Kansas
Michael C Murphy - Louisiana State University

10:57AM**Cilia Metasurfaces for Electronically Programmable Microfluidic Manipulation****Technical Presentation: IMECE2022-99344**

Wei Wang - Cornell University
Qingkun Liu - Cornell University
Ivan Tanasijevic - University of Cambridge
Michael Reynolds - Cornell University
Alejandro Cortese - Cornell University
Marc Miskin - University of Pennsylvania
Michael Cao - Cornell University
David Muller - Cornell University
Alyosha Molnar - Cornell University
Eric Lauga - University of Cambridge
Paul Mceuen - Cornell University
Itai Cohen - Cornell University

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TECHNICAL SESSIONS

THURSDAY, NOVEMBER 3

11:18AM**Folding 3D Thin-Film PZT MEMS With Electro-Thermal Micro-Origami****Technical Presentation: IMECE2022-99538***Yi Zhu - University of Michigan**Joonyoung Yu - University of Michigan**Kenn Oldham - University of Michigan**Evgueni Filipov - University of Michigan***11:39AM****Flexible Energy Harvesters for Harsh Environments: A Review****Technical Paper Publication: IMECE2022-95437***Andrew Haskell - Florida Polytechnic University**Seyed Soltani - Florida Polytechnic University***13-4: Applications of Micro and Nano Systems in Medicine and Biolog****13-04-02: Applied Mechanics and Materials in Micro- and Nano-Systems****10:15AM–12:00PM - CONVENTION CENTER, C160A****10:15AM****Nanostructuring of Iron Disulfide Cathode Materials for Enhanced Thermal Batteries****Technical Presentation: IMECE2022-99369***Lauren Morris - US Army, DEVCOM, Armaments Center**Giuseppe Di Benedetto - US Army DEVCOM Armaments Center**Brian Wightman - EnerSys Advanced Systems Inc.**Charles McMullan - US Army DEVCOM Armaments Center**Richard Dratler - US Army DEVCOM Armaments Center**David Swanson - EnerSys Advanced Systems Inc.***10:36AM****Design, Fabrication, and Characterization of Cryogenic Dielectric Nanocomposites****Technical Presentation: IMECE2022-99719***Jacob Mahon - Rowan University**Nicholas Mahon - Rowan University**Nicholas Gushue - Rowan University**Joseph Stanzione - Rowan University**Robert Krchnavek - Rowan University**Wei Xue - Rowan University***10:57AM****Thermo-Mechanical Aspects of Gamma Irradiation Effects on Gan Hemts****Technical Presentation: IMECE2022-94864***Md Abu Jafar Rasel - Penn State University**Sergei Stepanoff - Penn State University, University Park**Maxwell Wetherington - Penn State University,**Aman Haque - , Penn State University**Douglas Wolfe - Penn State University**Fan Ren - University of Florida**Stephen Pearton - University of Florida***11:18AM****Crack Path Instability With Step/ridge and Nano-Scale Texture Formation in Mono-Crystalline Diamond****Technical Presentation: IMECE2022-96958***Reaz Chaudhuri - University of Utah***13-2: Design and Fabrication, Analysis, Processes, and Technology for Micro and Nano Devices and Systems****13-02-02: Applications of Micro and Nano Systems in Medicine and Biology****2:00PM–3:45PM - CONVENTION CENTER, A222****IMECE**[®]**ONE GREAT LEARNING EXPERIENCE.**
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TECHNICAL SESSIONS

THURSDAY, NOVEMBER 3

2:00PM**Barbed Microneedle Design to Enhance Penetration and Retraction Forces Using Finite Element Modelling****Technical Paper Publication: IMECE2022-95590***Ranjith Janardhana - The University of New Mexico**Mateus Cabanlong - The University of New Mexico**Pavan Muttli - The University of New Mexico**Nathan Jackson - The University of New Mexico***2:21PM****Collecting Nanoscale Biological Particles for Analysis Using Electrophoretic Lift****Technical Presentation: IMECE2022-96006***Shaurya Prakash - The Ohio State University**Fraser Daniel - The Ohio State University**Kevin Lei - The Ohio State University***2:42PM****Gated Nanofluidics for Protein Capture and Release****Technical Presentation: IMECE2022-96027***Shaurya Prakash - The Ohio State University**Kaushik Rangharajan - The Ohio State University***3:03PM****Hysteresis Effect of Tangential Force Field on Deformation of Single Cell Migrating Between Different Micro-Striped Topography Patterns****Technical Paper Publication: IMECE2022-96617***Shigehiro Hashimoto - Kogakuin University**Hiroki Yonezawa - Kogakuin University**Kazuya Kishimoto - Kogakuin University***3:24PM****Micro Heat Exchanger to Cool Cerebrospinal Fluid for Brain Injury Treatment****Technical Presentation: IMECE2022-95670***Sachin Dahiya - Louisiana State University**Mohana Gurunadhan - Louisiana State University**Daniel S. Park - Louisiana State University**Corina Barbalata - Louisiana State University**Keith A. Gonthier - Louisiana State University**Manas Ranjan Gartia - Louisiana State University***13-6: Applied Mechanics and Materials in Micro- and Nano-Systems****13-06-02: Microfluidics 2022****2:00PM–3:45PM - CONVENTION CENTER, C160A****2:00PM****Quantifying Multiphase Flow of Aqueous Acid and Gas CO₂ in Deforming Porous Media Subject to Dissolution****Technical Paper Publication: IMECE2022-95873***Rafid Rahman - Montana State University**Elliott Niemus - Montana State University**Yaofa Li - Montana State University***2:21PM****Design, Fabrication and Testing of a Novel Thermally-Actuated Tesla Valve (TATV): A Hybrid Microvalve****Technical Paper Publication: IMECE2022-96265***Jonghyun Lee - TAMU**Ashok Thyagarajan - TAMU**Alaba Bamido - Texas A&M University**Nandan Shettigar - TAMU**Debjyoti Banerjee - Texas A&M University***2:42PM****Behavior of Myoblasts in Confluent Layer Under Shear Flow Field****Technical Paper Publication: IMECE2022-96619***Hiroki Yonezawa - Kogakuin University**Shigehiro Hashimoto - Kogakuin University**Haruki Kinoshiro - Kogakuin University*

TECHNICAL SESSIONS

THURSDAY, NOVEMBER 3

3:03PM**A Microfluidic Approach for Label-Free Identification of Small-Sized Microplastics in Seawater****Technical Presentation: IMECE2022-99526***Liyuan Gong - University of Rhode Island**Omar Martinez - University of Rhode Island**Pedro Mesquita - University of Rhode Island**Yang Xu - San Diego State University**Yang Lin - University of Rhode Island***13-3: Computational Studies on MEMS and Nanostructures****13-03-02: Micro and Nano Devices****2:00PM–3:45PM - CONVENTION CENTER, A223****2:00PM****Influence of Hematocrit on the Capillary Blood Flow in PDMS and PMMA Microchannels****Technical Presentation: IMECE2022-99917***Jinhyeok Bae - New Jersey Institute of Technology**Yudong Wang - New Jersey Institute of Technology**Bharath Babu Nunna - Weber State University**Siddhant Jadhav - University of Illinois at Urbana-Champaign**Eon Soo Lee - New Jersey Institute of Technology***2:21PM****Damage Compensation and Strain Correction in Piezocomposite Laminates****Technical Paper Publication: IMECE2022-95519***Grant Conaghan - Stevens Institute of Technology**Nicholas Payne - Stevens Institute of Technology***2:42PM****Computational Modeling of 2d Nanomechanical Resonators****Technical Presentation: IMECE2022-98936***Grzegorz (Greg) Hader - U.S. Army DEVCOM Armaments Center**Daniel Kaplan - U.S. Army DEVCOM Armaments Center**Eui-Hyeok Yang - Stevens Institute of Technology***3:03PM****Numerical Study of a Quantum Graphene Gyroscope****Technical Presentation: IMECE2022-99455***Aron Cummings - Catalan Institute of Nanoscience and Nanotechnology**Aleandro Antidormi - Catalan Institute of Nanoscience and Nanotechnology**Greg Hader - U.S. Army DEVCOM Armaments Center**Eui-Hyeok Yang - Stevens Institute of Technology***13-6: Applied Mechanics and Materials in Micro- and Nano-Systems****13-06-01: Microfluidics 2022****4:00PM–5:45PM - CONVENTION CENTER, A223****4:00PM****Microfluidic Contraction Flows of Viscoelastic Wormlike Micellar Solutions****Technical Presentation: IMECE2022-94622***Emad Jafari Nodoushan - Texas State University**Young Ju Lee - Texas State University**Gwan-Hyoung Lee - Seoul National University**Namwon Kim - Texas State University***4:21PM****Dielectrophoretic Movement of Cell Passing Between Surface Electrodes in Flow Channel****Technical Paper Publication: IMECE2022-94776***Shigehiro Hashimoto - Kogakuin University***IMECE**[®]**ONE GREAT LEARNING EXPERIENCE.**
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TECHNICAL SESSIONS

THURSDAY, NOVEMBER 3

4:42PM

Dynamics of a Viscous Drag Pump for Maxwell Immiscible Fluids Under Interfacial Electroosmotic and Hydrophobic Effects in a Microannulus

Technical Paper Publication: IMECE2022-95122

Juan P. Escandón - Instituto Politécnico Nacional, SEPI-ESIME Unidad Azcapotzalco

Cesar A. Valencia - Instituto Politécnico Nacional, SEPI-ESIME Unidad Azcapotzalco

David A. Torres - Instituto Politécnico Nacional, SEPI-ESIME Unidad Azcapotzalco

Clara G. Hernández - Instituto Politécnico Nacional, SEPI-ESIME Unidad Azcapotzalco

5:03PM

Parametric Study of Viscoelastic Flow Simulations in Microfluidic Devices

Technical Paper Publication: IMECE2022-95153

Guanyang Xue - Lehigh University

Justin Caspar - Lehigh University

Jaber Asiri - Lehigh University

Xuanhong Cheng - Lehigh University

Alparslan Oztekin - Lehigh University

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

13-02-03: Applications of Micro and Nano Systems in Medicine and Biology

4:00PM–5:45PM - CONVENTION CENTER, A222

4:00PM

Improving Cancer Diagnostics Through Innovative Microfluidic and Nanofluidic Technologies

Invited Presentation: IMECE2022-99042

Shaurya Prakash - The Ohio State University

4:42PM

Enhanced Effect of Dean Vortex to Separate Blood Plasma During Capillary Flow in the Spiral Microchannel for Point-of-Care (POC) Applications

Technical Presentation: IMECE2022-99670

Yudong Wang - New Jersey Institute of Technology

Bharath Babu Nunna - Weber State University

Niladri Talukder - New Jersey Institute of Technology

Jinhyeok Bae - New Jersey Institute of Technology

Siddhant Jadhav - University of Illinois at Urbana-Champaign

Eon Soo Lee - New Jersey Institute of Technology

5:03PM

Highly Efficient Rapid Self-Separation of Blood Plasma From Whole Blood Using 3d Printed Nano-Structured Surface Engineering in Microfluidic Platforms

Technical Presentation: IMECE2022-100196

Bharath Babu Nunna - Weber State University

Yudong Wang - New Jersey Institute of Technology

Niladri Talukder - New Jersey Institute of Technology

Eon Soo Lee - New Jersey Institute of Technology

5:24PM

Microfiltration Device for the Isolation of Circulating Tumor Cells (MEMS)-(CTCs)

Technical Paper Publication: IMECE2022-96140

Alan Javier Gonzalez-Diaz - Universidad Industrial de Santander

Carlos Borràs-Pinilla - Universidad Industrial de Santander



TECHNICAL SESSIONS

Track 14: Safety Engineering, Risk and Reliability Analysis

Sponsored by the Safety Engineering and Risk Analysis Division

Track Organizer: William Paul Munsell Jr.

Track Co-Organizer: Alice Sun

Track Co-Organizer: Andrey Morozov

Track Co-Organizer: Ernie Kee

Track Co-Organizer: John Wiechel

Track Co-Organizer: Mihai Diaconeasa

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 for Safety, Reliability, and Maintenance
- 14-7: Big Data and IoT Applications in Reliability, Maintenance, and Security
- 14-8: Crashworthiness, Occupant Protection, and Biomechanics
- 14-9: Congress-Wide Symposium on Prognostic and Health Management: NDE and prognostics of structures and systems
- 14-10: Users, Technology, and Human Reliability in Safety Engineering
- 14-11: Student Safety Innovation Challenge
- 14-14: Developments in Design Theory for Component and System Safety and Reliability

ACKNOWLEDGMENT TRACK ORGANIZERS

Track Organizer: William Paul Munsell Jr., University of Oklahoma

Track Co-Organizer: Alice Sun

Track Co-Organizer: Andrey Morozov, University of Stuttgart

Track Co-Organizer: Ernie Kee, University of Illinois at Urbana-Champaign, Urbana

TOPIC ORGANIZERS

Alice Sun

Andrey Morozov, Universitat Stuttgart

Arjun Earthperson, North Carolina State University

Bhadir Karba, Uludag University

Bill Munsell, Munsell Consulting Services

Ernie Kee, University of Illinois Urbana-Champaign

John Homer, Centers for Disease Control and Prevention

John Wiechel, SEA

Mahmud Hasan, University of Houston Downtown

Mihai A. Diaconeasa, North Carolina State University

Mohamed Ridha Baccouche, Ford Motor Company

Ozhan Gecgel, Texas Tech University

Priyanka Pandit, North Carolina State University

Saeed Barbat, Ford Motor Company

Shweta Dabetwar, Texas Tech University

Stephen Ekworo-Osire, Texas Tech University

Yanfeng Shen, Shanghai Jiao Tong University

SESSION ORGANIZERS

Andrey Morozov - University of Stuttgart

Bhadir Karba - Uludag University

Ernie Kee - University of Illinois at Urbana-Champaign

Hassan Elhor - Stellantis

John Homer - Centers for Disease Control and Prevention

John Wiechel - SEA

Mihai Diaconeasa - North Carolina State University

Mohamed Ridha Baccouche - Ford Motor Company

Ozhan Gecgel - Texas Tech University

Philipp Grimmeisen - University of Stuttgart

Saeed Barbat - Ford Motor Company

William Munsell - Munsell Consulting Services



TECHNICAL SESSIONS

WEDNESDAY, NOVEMBER 2

TRACK 14

WEDNESDAY, NOVEMBER 2

14-1: General Topics on Risk, Safety, and Reliability

14-01: General Topics on Risk, Safety, and Reliability

10:45AM–12:30PM - CONVENTION CENTER, B234

10:45AM

Artificial Neural Network for Automatic Prediction of the Machining Type via Classifying the Surface Texture

Technical Paper Publication: IMECE2022-94192

*Hassan Alqahtani - Taibah University
Asok Ray - Pennsylvania State University*

11:06AM

Asset Management in the Mining Sector Based on Reliable and Sustainable Supplier Selection: A South African Case Scenario

Technical Paper Publication: IMECE2022-95103

*Joachim Gidiagba - University of Johannesburg
Modestus Okwu - University of Johannesburg
Lagouge Tartibu - University of Johannesburg*

11:27AM

Reliability and Safety Assessment of Passive Safety Systems Through Coupling of Fault Tree Analysis and Artificial Neural Network

Technical Paper Publication: IMECE2022-95897

*Parham Khosravi Babadi - Ontario Tech University
Lixuan Lu - Ontario Tech University*

11:48AM

Development of a Unified Graph Class for Supply Chain Shortage Quantification

Technical Paper Publication: IMECE2022-96131

*Daniel Nevius - North Carolina State University
Priyanka Pandit - North Carolina State University
Arjun Earthperson - North Carolina State University
Mihai Diaconeasa - North Carolina State University*

12:09PM

Air Conditioner Fault Diagnosis Based on Improved Bayesian Network

Technical Paper Publication: IMECE2022-96853

*Jiaqi Xu - China Jiliang University
Juan Zhou - China Jiliang University
Qiang Wang - China Jiliang University
Chongjun Yang - China Jiliang University*

14-8: Crashworthiness, Occupant Protection, and Biomechanics

14-08-01: Crashworthiness, Occupant Protection, and Biomechanics

2:00PM–3:45PM - CONVENTION CENTER, A226

2:00PM

Design of a New Vehicle Front End Structure to Optimise Crashworthiness

Technical Paper Publication: IMECE2022-95911

*Mohab Elmarakbi - Northumbria University
Madeleine Combrinck - Northumbria University
Ahmed Elmasry - Northumbria University
Ahmed Elmarakbi - Northumbria University*



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TECHNICAL SESSIONS

WEDNESDAY, NOVEMBER 2

2:21PM

Analysis of Exit Time Differences Between Gated and Open Operator Compartments in Stand-Up End-Controlled Forklifts With an Examination of Injury Potential for Tip-Over and Off-Dock Incidents

Technical Paper Publication: IMECE2022-95520
Jonathan Martinez - Biodynamic Research Corporation
Alex Germane - Biodynamic Research Corporation
Richard Watson - Biodynamic Research Corporation
Lisa Gwin - Biodynamic Research Corporation

2:42PM

Evaluation of Forward-Facing Child Safety Seat Harness Retainer Clip Position in 35 mph Frontal Barrier Crash Tests

Technical Paper Publication: IMECE2022-88927
Lauren Bell - SAFE
Steven Meyer - SAFE
Brian Herbst - SAFE

3:03PM

Numerical Simulation and Occupant Injury Prediction Under Side Impact Loading Using Human Surrogate Model

Technical Paper Publication: IMECE2022-95063
Prasanna Arathanakotti - Indian Institute of Technology Madras
Raghu Prakash - Indian Institute of Technology Madras

3:24PM

Finite Element-Incorporated Multiscale Micromechanics Modelling of Vehicle Crashworthiness for Three-Phase Hybrid Fibres Reinforced Graphene Nano-Composite Materials

Technical Paper Publication: IMECE2022-95091
Ahmed Elmasry - Northumbria University
Wiyao Azoti - University of Strasbourg
Ahmed Elmarakbi - Northumbria University

14-4: Reliability and Safety in Transportation Systems**14-04: Reliability and Safety in Transportation Systems****2:00PM–3:45PM - CONVENTION CENTER, B234****2:00PM**

Weighted Rail Network Topological Analysis by Waybill Commodity Volumes

Technical Paper Publication: IMECE2022-95460
Yujie Mao - University of Maryland
Sherief Elsibaie - University of Maryland
Bilal Ayyub - University of Maryland
Magdy Elsibaie - University of Maryland
Tarek Omar - Federal Railroad Administration
Karen McClure - Federal Railroad Administration

2:21PM

Nes3: A Ship-Consensus Double-Layer Blockchain System in New Energy Ship Supervision Scenario

Technical Paper Publication: IMECE2022-94668
Gang'ao Yan - Wuhan University of Technology
Youan Xiao - Wuhan University of Technology
Tengfei Wang - Wuhan University of Technology
Zhuo Li - Wuhan University of Technology

2:42PM

Electric Vertical Take-Off and Landing Vehicle Reliability and Safety Analysis

Technical Paper Publication: IMECE2022-97038
Karla Raigoza - Cornell University
Arthur Chadwick - Cornell University
Chiranth Kishore - Cornell University



TECHNICAL SESSIONS

WEDNESDAY, NOVEMBER 2

3:03PM**Towards the Deep Learning-Based Autonomous Collision Avoidance****Technical Paper Publication: IMECE2022-94600**

Binxin He - Wuhan University of Technology
Youan Xiao - Wuhan University of Technology
Tengfei Wang - Wuhan University of Technology
Zhuo Li - Wuhan University of Technology

3:24PM**Thermal-Structure Coupling Simulation Method and Thermal Fatigue Life Prediction of Automobile Brake Disc****Technical Paper Publication: IMECE2022-94053**

Yuxuan Geng - Beihang University
Yingchun Shan - Beihang University
Xiandong Liu - Beihang University
Yizhuo Wang - Beihang University
Xianyu Zeng - Beihang University

14-6: Machine Learning for Safety, Reliability, and Maintenance**14-06: Machine Learning for Safety, Reliability, and Maintenance****4:00PM–5:45PM - CONVENTION CENTER, B234****4:00PM****Creep-Fatigue Reliability Analysis Integrated With Surrogate Modelling: Application on Industrial Case Studies****Technical Paper Publication: IMECE2022-94273**

Run-Zi Wang - Tohoku University
Ken Suzuki - Tohoku University
Hideo Miura - Tohoku University
Xian-Cheng Zhang - East China University of Science and Technology
Shan-Tung Tu - East China University of Science and Technology

4:21PM**Early Diagnosis of Tooth Root Cracks for Non-Standard Involute Spur Gears With Deep Learning****Technical Paper Publication: IMECE2022-95910**

Fatih Karpat - Bursa Uludag University
Onur Can Kalay - Bursa Uludag University
Ahmet Emir Dirik - Bursa Uludag University
Esin Karpat - Bursa Uludag University

4:42PM**Detection and Classification of Robotic Manipulator Anomalies Using MLSTM-FCN Models****Technical Paper Publication: IMECE2022-95361**

Yuliang Ma - University of Stuttgart
Philipp Grimmeisen - University of Stuttgart
Andrey Morozov - University of Stuttgart

5:03PM**Research of Task Complexity Decision System for Manual Assembly Tasks Using Fuzzy Cognitive Maps to Construct Bayesian Networks****Technical Paper Publication: IMECE2022-93881**

Zhao Xuan - Iwate University
Zheng Shengen - Iwate University

5:24PM**Books Trimmer Industrial Machine Knives Diagnosis: A Condition-Based Maintenance Strategy Through Vibration Monitoring via Novelty Detection****Technical Paper Publication: IMECE2022-94547**

Luca Viale - Politecnico di Torino
Alessandro Paolo Daga - Politecnico di Torino
Luigi Garibaldi - Politecnico di Torino
Salvatore Caronia - Tecnau SRL
Ilaria Ronchi - Tecnau SRL

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TECHNICAL SESSIONS

WEDNESDAY, NOVEMBER 2

14-8: Crashworthiness, Occupant Protection, and Biomechanics**14-08-02: Crashworthiness, Occupant Protection, and Biomechanics and Extended Topics in Energy Systems****4:00PM–5:45PM - CONVENTION CENTER, A226****4:00PM****Stochasticity Graded Structures Under Impact Loads****Technical Presentation: IMECE2022-96693***Leidong Xu - University of Connecticut**Zihan Wang - University of Connecticut**Hongyi Xu - University of Connecticut***4:21PM****Mechanical Latches for Occupant Restraint Systems****Technical Presentation: IMECE2022-99109***Vivek Srinivas - The Ohio State University**Marcelo Dapino - The Ohio State University**Leon Headings - The Ohio State University***4:42PM****Design and Evaluation of a Mash Test Level 2 Compliant Permanent Concrete Low-Profile Barrier****Technical Presentation: IMECE2022-99265***Maysam Kiani - Texas A&M Transportation Institute**Chiara Silvestri Dobrovolny - Texas A&M Transportation Institute***5:03PM****Stress Concentration Mechanism in Superconducting Coil Quench Phenomenon by Large-Scale Finite Element Analysis****Technical Paper Publication: IMECE2022-94914***Yousuke Hisakuni - Toshiba Corporation**Akira Kano - Toshiba Corporation**Hideaki Uehara - Toshiba Corporation**Tomoko Monda - Toshiba Corporation**Junko Hirokawa - Toshiba Corporation**Osamu Nishimura - Toshiba Corporation**Kenji Hirohata - Toshiba Corporation**Toshinobu Ito - Toshiba Energy Systems & Solutions Corporation**Shohei Takami - Toshiba Energy Systems & Solutions Corporation**Kiyokazu Sato - Toshiba Energy Systems & Solutions Corporation***5:24PM****Numerical Study on Diffusion Law and Risk Assessment of Indoor Hydrogen Leakage****Technical Paper Publication: IMECE2022-96464***Yanbo Shao - China University of Petroleum (East China)**Xuwen Cao - China University of Petroleum (East China)**Hao Li - China University of Petroleum (East China)**Wenzhu Xia - China University of Petroleum (East China)**Weibing Zhang - China Petroleum Engineering & Construction Corporation North China Company**Zhigui Zhang - China Petroleum Engineering & Construction Corporation North China Company**Zilong Nan - China Petroleum Engineering & Construction Corporation North China Company**Jiang Bian - China University of Petroleum (East China)***IMECE**[®]**ONE GREAT LEARNING EXPERIENCE.**
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TECHNICAL SESSIONS

THURSDAY, NOVEMBER 3

THURSDAY, NOVEMBER 3

Track 14: Safety Engineering, Risk and Reliability Analysis

Thursday, November 3, 9:15AM-10:00AM

Room: A226

Greater Columbus Convention Center

Title: Propagation based fault detection, discrimination, and safety analysis for industrial systems*Carol Smidts
The Ohio State University***14-12: Developments in Design Theory for Component and System Safety and Reliability****10:15AM–12:00PM - CONVENTION CENTER, A225****10:15AM****Methods for Evaluating the Effect of Slack Rope Condition in a Nuclear Material Handling Equipment****Technical Paper Publication: IMECE2022-96171***Deepak Gupta - Konecranes Nuclear Equipment and Services, LLC**Pugazhendhi Kanakasabai - Konecranes Nuclear Equipment and Services, LLC***10:36AM****Evaluation of Cryogenic Air Supply as Breathable Air Source for a Confined Space****Technical Paper Publication: IMECE2022-93688***Lincan Yan - Centers for Disease Control and Prevention/National Institute for Occupational Safety and Health**Dave Yantek - National Institute for Occupational Safety and Health**Cory Degennaro - National Institute for Occupational Safety and Health**Justin Srednicki - National Institute for Occupational Safety and Health**Jeffrey Yonkey - National Institute for Occupational Safety and Health**Brandin Lambie - National Institute for Occupational Safety and Health**Jacob Carr - National Institute for Occupational Safety and Health***10:57AM****Effects of Cyclic Loading Frequencies on Fatigue Strength of Aluminum 6061-T6****Technical Paper Publication: IMECE2022-94129***Xiaobin Le - Wentworth Institute of Technology***11:18AM****Safe Design of Gas-Management Systems for Turning Bolt-Action Rifles in View of Known Ammunition Mismatch Hazards****Technical Paper Publication: IMECE2022-94527***W.P. Munsell, Jr. - Munsell Consulting Services***11:39AM****Safe Design Considerations for Buckling Failures of Ladder-Style Hunting Treestands****Technical Paper Publication: IMECE2022-95944***William Munsell - Munsell Consulting Services*

TECHNICAL SESSIONS

THURSDAY, NOVEMBER 3

14-5: Models and Methods for Probabilistic Risk Analysis**14-05-01: Models and Methods for Probabilistic Risk Analysis****10:15AM–12:00PM - CONVENTION CENTER, A224****10:15AM**

Automated Generation of Hybrid Probabilistic Risk Models From SysML V2 Models of Software-Defined Manufacturing Systems

Technical Paper Publication: IMECE2022-95433

Philipp Grimmeisen - University of Stuttgart

Yuliang Ma - University of Stuttgart

Mihai Diaconeasa - North Carolina State University

Andrey Morozov - University of Stuttgart

10:36AM

A Probabilistic Analysis in Vibration-Assisted Drilling to Measure Dynamic Behavior During Drilling and Understand Risk Factors

Technical Paper Publication: IMECE2022-95600

Eleazar Marquez - The University of Texas Rio Grande Valley

Samuel Garcia - Texas State University

10:57AM

Enhanced Fault Detection of Vehicle Lateral Dynamics Using a Dynamically Adjustable Bayesian Network Structure and EKF

Technical Paper Publication: IMECE2022-94176

Tolga Bodrumlu - AVL

Mehmet Murat Gözüm - AVL

Batıkan Kavak - AVL

11:18AM

Effects of Residual Stresses Caused by Turning on Probabilistic Risk of Aeroengine Titanium Disks

Technical Paper Publication: IMECE2022-91384

Guo Li - Beihang University

Wenhao Cai - Beihang University

Huimin Zhou - Beihang University

Junbo Liu - Beihang University

Shuiting Ding - Civil Aviation University of China

11:39AM

A Sensitivity Analysis Method of Shot Peening Parameters Based on Probabilistic Surface Damage Tolerance Assessment

Technical Paper Publication: IMECE2022-94987

Guo Li - Beihang University

Yida Teng - Beihang University

Xingyu Zhang - Beihang University

Shuiting Ding - Civil Aviation University of China

14-5: Models and Methods for Probabilistic Risk Analysis**14-05-02: Models and Methods for Probabilistic Risk Analysis****2:00PM–3:45PM - CONVENTION CENTER, A224****2:00PM**

Probability Quantification in Protective System Efficacy Analysis: Stochastic Dynamics, Information Flow, and Initiating Event Arrival Times

Technical Paper Publication: IMECE2022-94954

Martin Wortman - The Organization for Public Awareness of Hazardous Technology Risks

Ernest Kee - The Organization for Public Awareness of Hazardous Technology Risks

Pranav Kannan - The Organization for Public Awareness of Hazardous Technology Risks



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TECHNICAL SESSIONS

THURSDAY, NOVEMBER 3

2:21PM**Numerical Simulation of Accidental Leakage and Diffusion of Liquid Hydrogen in the Laboratory****Technical Paper Publication: IMECE2022-96711***Hao Li - China University of Petroleum (East China)**Xuwen Cao - China University of Petroleum**Lin Teng - Fuzhou University**Yi Wu - China University of Petroleum (East China)**Jiang Bian - China University of Petroleum (East China)***2:42PM****Study of Probabilistic Risk Assessment Solvers Using a Generic Pressurized Water Reactor Standardized Plant Analysis Risk Model and Synthetically Generated Risk Models****Technical Paper Publication: IMECE2022-95783***Egemen M. Aras - North Carolina State University**Asmaa S. Farag - North Carolina State University**Arjun Earthperson - North Carolina State University**Mihai A. Diaconeasa - North Carolina State University***3:03PM****Probabilistic Reliability Analysis Method Based on Surrogate Model for Wind Turbine Drivetrain Structure Subjected to Random Dynamic Load****Technical Paper Publication: IMECE2022-94043***Tomohiko Jimbo - Toshiba Corporation**Akira Kano - Toshiba Corporation**Yousuke Hisakuni - Toshiba Corporation**Yasutaka Ito - Toshiba Corporation**Kenji Hirohata - Toshiba Corporation**Tsuyoshi Ichimura - The University of Tokyo***3:24PM****High Resolution Real Time Synthetic Aperture Imaging in Solids Using Virtual Elements****Technical Paper Publication: IMECE2022-94445***Chengyang Huang - University of California, San Diego**Francesco Lanza Di Scalea - University of California, San Diego***14-10: Users, Technology, and Human Reliability in Safety Engineering****14-10-01: Users, Technology, and Human Reliability in Safety Engineering****4:00PM–5:45PM - CONVENTION CENTER, A224****4:00PM****Economic Viability vs. Risk Mitigation: An Experimental Investigation of Project Budget Investment Decisions in Engineering Students****Technical Paper Publication: IMECE2022-95484***Mark Midlick - Penn State University**Jeremy Gernand - Penn State University***4:21PM****Evaluation of Head Injury Patterns and Risk Mitigation Strategies Associated With Falls From Playground Equipment****Technical Paper Publication: IMECE2022-95652***Mark Gutttag - Exponent**Eugenia Kennedy - Exponent**Juff George - Exponent**Stephanie Pasquesi - Exponent*

TECHNICAL SESSIONS

THURSDAY, NOVEMBER 3

4:42PM

How Do Maintenance Personnel Perceive Occupational Safety and Health (OSH) Risks During Major Overhauls, Outages, Shutdowns or Turnarounds (MoOSTs)? An Examination of the Nigerian Cement Industry

Technical Paper Publication: IMECE2022-89020

Akilu Yunusa-Kaltungo - University of Manchester

Rukaiyatu Mohammed Jungudo - The University of Manchester

Srija Ray - The University of Manchester

Idowu Sokunbi - Lafarge Africa PLC

5:03PM

The Real-Time Human Reliability Detection System Based on Ship Bridge Videos

Technical Paper Publication: IMECE2022-94593

Shuoping Wang - School of Information Engineering, Wuhan University of Technology

Youan Xiao - School of Information Engineering, Wuhan University of Technology

Tengfei Wang - School of transportation and logistics engineering, Wuhan University of Technology

Zhuo Li - School of Information Engineering, Wuhan University of Technology

5:24PM

Design, Analysis and Test of Truck Frame and Bolster for Railway Vehicle

Technical Paper Publication: IMECE2022-96184

Jianran Wang - CRRC MA Corporation

Wenkang Zhang - CRRC Changchun Railway Vehicles Co., Ltd.

Haifeng Zhang - CRRC MA Corporation

Hong Zhang - CRRC MA Corporation

Shihai Xue - CRRC Changchun Railway Vehicles Co., Ltd.

Haifeng Hong - CRRC Changchun Railway Vehicles Co., Ltd.



Poster Section

***Please see the conference app for the most up to date information*



TRACK POSTER SECTION

Track 15: ASME International Undergraduate Research and Design Exposition

Track Organizer: Eleonora Tubaldi

Track Co-Organizer: Mohsen Ghamari

Topics:

15-1: General

15-1 GENERAL

5:30PM–7:00PM - Exhibit Hall D

U1. The AI Rock Paper Scissors Machine

Undergraduate Expo: IMECE2022-94633

Evan Kluger, Benjamin Meiner, Michelle Katz, Kanghyuk Lee - Cooper Union

U2. A Novel Methodology for Traditional Aquafarming

Undergraduate Expo: IMECE2022-94745

Siva Prasad Kowdodi, Pavan Kumar Pabba, Yuvaraj Gajalajamgam, Giridhar Vanamamala - Hyderabad Institute of Technology and Management

U3. Buoyancy-Induced Convection Driven by Frontal Polymerization

Undergraduate Expo: IMECE2022-99015

Manxin Chen, Yuan Gao, Justine Paul, Nancy Sottos, Geubelle Philieppe, University of Illinois Urbana-Champaign

U4. Computational Fluid Dynamics Analysis of Kaplan Turbines in Nominal Operating Conditions at the Yacyretá Hydropower Plant: A Case Study

Undergraduate Expo: IMECE2022-99133

Vivian Gonzalez, Liz Esquivel, Elias Espínola, Fernando Arenas, Jovan Toews, Patrik Kehler, Jorge Kurita - Universidad Nacional de Asunción

U5. Thermal Mechanical Performance of Defective Perovskite

Undergraduate Expo: IMECE2022-99197

Cassidy McCormick, Zubaer Hossain - University of Delaware

U6. Lightweight Low-Cost Materials and Design for 3D-Printable Prosthetics

Undergraduate Expo: IMECE2022-99200

Kevin Wolynetz, Zubaer Hossain - University of Delaware

U7. Failure Analysis of a Bench Vise

Undergraduate Expo: IMECE2022-99573

Luz Paulina Ramirez Parra, Mónica Vanessa Sánchez Trejo, Alan Gustavo Ortiz Aguirre, Alberto Córdoba Casas, Santiago Pietra Santa Alcalá - Monterrey Institute of Technology and Higher Education

U8. High Strain Characterization of Simulated Brain Tissue Using DIC

Undergraduate Expo: IMECE2022-99683

Lauren Hutchison, Jacob Navarro, Ashfaq Adnan - The University of Texas at Arlington

U9. Developing Electrically Equivalent Phantom Skull Using PDMS-Based Nanocomposites

Poster Presentation: IMECE2022-99888

Tina Ko, Yukti Shinglot, Richie Ranaisa Daru, Ashfaq Adnan - The University of Texas at Arlington

U10. Structure-Property Relations of PDMS-Based Nanocomposites as a Brain Simulant Material

Undergraduate Expo: IMECE2022-99890

Yukti Shinglot, Tina Ko, Richie Ranaisa Daru, Ashfaq Adnan - The University of Texas at Arlington

U11. Asymmetrically Tough Composites

Undergraduate Expo: IMECE2022-99903

John Papadopoulos - NASA DE Space Grant Zubaer Hossain - University of Delaware



TRACK POSTER SECTION

U12. Anti-Corrosion Behavior of Mg and Zn Nanoparticle Incorporated Nanofiber Membrane

Undergraduate Expo: IMECE2022-100395

*Hussein Alizereej, Onyedikachi Oti, Musharraf Zaman, Morshed Khandaker - University of Central Oklahoma***U13. Design of a Mobile Kids-Friendly Handwashing Station for a Daycare**

Undergraduate Expo: IMECE2022-95428

*Daniel E. Rutkowski, Grant B. Williams, Hasan F. Al-Haraz, Pezhman Hassanpour - Gannon University***U14. Computational Fluid Dynamics Based Optimization Design of Naturally Ventilated Roofs**

Undergraduate Expo: IMECE2022-100407

*Weihan Zhang - Winchester College***U15. An Experiment on the Influence of Noise in a Circular Array Exhibiting High Amplitude Localization**

Undergraduate Expo: IMECE2022-100540

*Jonathan DeBoer - University of Maryland, College Park***U16. Enhancement of Two-Phase Immersion Cooling Using Submerged Synthetic Jet Impingement on Simulated High-Power Electronic Components**

Undergraduate Expo: IMECE2022-100541

*Elsaid Youssef, John Schofield, Alfonso Ortega - Villanova University***U17. Impact of Infill and Shell Design Features on Compression Stiffness in Material Extrusion of Thermoplastic Urethane**

Undergraduate Expo: IMECE2022-100554

*Ryan Van Domelen, John Wentz, Duy Le, Andrew Broman, Sandra Hawley - University of St. Thomas***U18. Pressure Measurement at the Surface of a Cylinder in Subsonic Wind Tunnel**

Undergraduate Expo: IMECE2022-100572

*Mirza Cirak, Matthew Clouse, Troy Steward, Boston Wimmer, Manohar Chidurala - Western Kentucky University***U19. Experimental Study of the Nanofin Effect (NFE) During Thin Film Evaporation From Nanopores in Anodic Aluminum Oxide (AAO) Membrane Substrates Integrated With Nano-Thermocouple/Thin Film Thermocouple (TFT) Array**

Undergraduate Expo: IMECE2022-100594

*Juliet Shafer, Jonghyun Lee, Ashok Thyagarajan, Debjyoti Banerjee - Texas A&M University***U20. Probing Macromolecular Complexes With a Reconfigurable Nanoscale DNA Force Spectrometer**

Undergraduate Expo: IMECE2022-100634

*Yuchen Wang, Carlos Castro - The Ohio State University***U21. A Novel Magnetorheological Elastomer-Based Artificial Pancreas**

Undergraduate Expo: IMECE2022-100660

*Valesia Davis, Rubayet Hassan, Mohammad Fuad Hassan, Sevki Cesmececi - Georgia Southern University***U22. Variable Range Torsional Pendulum Thrust Balance for Electric Propulsion Testing**

Undergraduate Expo: IMECE2022-100662

*Ishaan Mishra, Jacob Consalvi - Rose-Hulman Institute of Technology***U23. Evaluating Ultra-High-Temperature Heaters for Use in a Gas-Phase Synthesis of Metals,**

Undergraduate Expo: IMECE2022-100674

Lena Juenger - Washington University in St. Louis

TRACK POSTER SECTION

U24. Computational Design and Development of Sialon Composites for Cutting Tools

Undergraduate Expo: IMECE2022-95019

*Hasan Syed, Abba Abubakar, Abbas Hakeem - King Fahd University of Petroleum and Minerals***U25. Toward Automatic Ground-Truth Image Labelling Using Industrial Robotics and Motion Capture**

Undergraduate Expo: IMECE2022-100682

*Charles Doherty, Harrison Helmich, Michael Kutzer, Donald Costello - U.S. Naval Academy***U26. Investigation of Stresses Experienced by Wind Turbine Blades by Using Fluid-Structure Interaction Analysis**

Undergraduate Expo: IMECE2022-100691

*Manohar Chidurala, Joe Hughes - Western Kentucky University***U27. Development of a Haptic Glove for Two Fingers (Index and Middle) of the Right Hand**

Undergraduate Expo: IMECE2022-100692

*Sebastian Roa Prada, Jhon A. Caballero Moreno - Universidad Autónoma de Bucaramanga***U28. Design and Manufacturing of Metastructures for Different Applications**

Undergraduate Expo: IMECE2022-100693

*Anisia Tiplea, Huan Zhao, Xiangbei Liu, Julia Huddy, William Scheideler, Yan Li - Dartmouth College***U29. Facility Measurement Validation Using Asme Nozzle Vectored Thrust Tests**

Undergraduate Expo: IMECE2022-100698

*Anette Lira, Ziaul Huque, Yuhao Xu - Prairie View A&M University**Oliver Michael, NASA Glenn Research Center***U30. Novavent Project Sensor Development**

Undergraduate Expo: IMECE2022-100702

*John Schofield, Elsaid Youssef, Alfonso Ortega - Villanova University***U31. Multi-Axis 3D Printer**

Undergraduate Expo: IMECE2022-95564

*Joshua Short, Ben Warner, Gavin Shepherd, Duron Lee Scruggs, Laura Southard, He Bai, Hadi Noori - Oklahoma State University***U32. Design and Analysis of Poly(ϵ -Caprolactone) Flow Diverters**

Undergraduate Expo: IMECE2022-95954

*Mohammad Hossan, Seth Harriet, Vishal Barot - University of Central Oklahoma***U33. Innovation and Study of Formula 1 Race Car Rear Wings Through Computational Fluid Dynamics and Machine Learning**

Undergraduate Expo: IMECE2022-96002

*Ken Cheng - Crescent School***U34. Bio-Mechanical Engineering a Better Self-Examination Tool**

Undergraduate Expo: IMECE2022-96377

*Caitlin Crowley, Donald Mueller - Purdue University Fort Wayne***U35. Optimization Design of Roof Heat Transfer Based on Computational Fluid Dynamics**

Undergraduate Expo: IMECE2022-96735

*Weihan Zhang - Winchester College***U36. Rover Design for Mars Missions**

Undergraduate Expo: IMECE2022-98830

Shazad Ali, Sean Ali, Jonas Ahonen, John Creley, Ben Levine, Maurizio Manzo - University of North Texas

TRACK POSTER SECTION

WEDNESDAY, NOVEMBER 2

WEDNESDAY, NOVEMBER 2

TRACK 16

Track 16 ASME International Undergraduate Research and Design Exposition (Posters Only)

Track Organizer: Po-hao Huang - University of Arkansas

16-01-01: Poster Session: NSF-Funded Research (Grad & Undergrad)

12:00PM–4:00PM - Exhibit Hall D

N100. Plasticity and Ductile Failure Using the Fast Convolution-Based Method for Peridynamic Formulations

NSF Poster Presentation: IMECE2022-100171

Farzaneh Mousavi, Florin Bobaru - University of Nebraska-Lincoln

Siavash Jafarzadeh - The Pennsylvania State University

N101. Multi-Stage Additive Manufacturing for Multi-Scale Porous Ceramics

NSF Poster Presentation: IMECE2022-92021

Zipeng Guo, Chi Zhou - University at Buffalo

N102. A Modified Opto-Acoustic Method for Measuring Thickness-Dependent Material Property Gradients

NSF Poster Presentation: IMECE2022-99465

Anastasia Timofeeva, Runqiao Song, Brendan O'connor, Kara Peters - North Carolina State University

N103. In-Situ Monitoring of Printed Layer Surface Topography During Laser Powder Bed Fusion via Fringe Projection Profilometry

NSF Poster Presentation: IMECE2022-99498

Haolin Zhang, Chaitanya Krishna Vallabh, Xiayun Zhao - University of Pittsburgh

N104. In Situ Nonlinear Ultrasonic Wave Measurements to Correlate β to Tension and Fatigue Damage of Stainless Steel 316L: The Effect of Grain Orientations and Slip Irreversibility

NSF Poster Presentation: IMECE2022-99405

Hyeelim Do, Changgong Kim, Kathryn Matlack - University of Illinois at Urbana-Champaign

N105. Automated Modeling Technique for the Energy Efficient Design of District Heating Networks

NSF Poster Presentation: IMECE2022-99408

Audrey Blizard, Stephanie Stockar - The Ohio State University

N106. Parametric Study of an Active Grid Turbulence Generator to Reproduce Real-World Tidal Flow Conditions

NSF Poster Presentation: IMECE2022-99409

Christopher Ruhl, Arindam Banerjee - Lehigh University

N107. Buckling-Induced Functionalities of Origami Tubes

NSF Poster Presentation: IMECE2022-99328

Zhongyuan Wo, Evgueni Filipov - University of Michigan

N108. Understanding the Diffusivity of Water Through Plant-Inspired, Osmotically-Active, Elastomeric Membranes

NSF Poster Presentation: IMECE2022-99318

Alexandra Spitzer, Shelby Hutchens - University of Illinois Urbana-Champaign

N109. Vibration and Wave Control in Nonlinear Mechanical Rotator Lattices

NSF Poster Presentation: IMECE2022-99324

Lezheng Fang, Michael Leamy - Georgia Institute of Technology



TRACK POSTER SECTION

WEDNESDAY, NOVEMBER 2

N110. Compact Representation and Secure Sharing of Metal Microstructure Data

NSF Poster Presentation: IMECE2022-99314

*Dharanidharan Arumugam, Ravi Kiran - North Dakota State University***N111. Magnetoconvection in a Long Vertical Enclosure With Walls With Finite Electrical Conductivity**

NSF Poster Presentation: IMECE2022-99306

*Ali Akhtari, Oleg Zikanov - University of Michigan-Dearborn**Dmitry Krasnov - Technische Universität Ilmenau***N112. Thermal Bubble-Driven Micro-Pumps: The Building Blocks to Bring Microfluidics to the Masses**

NSF Poster Presentation: IMECE2022-88403

*Brandon Hayes, Robert Maccurdy - University of Colorado Boulder***N113. Does Network Architecture Matter for Loop-Unrolled Elastic Localization?**

NSF Poster Presentation: IMECE2022-99357

*Conlain Kelly, Surya Kalidindi - Georgia Institute of Technology***N114. Numerical Wave Experiments: Physics-Based and Data-Driven Approaches**

NSF Poster Presentation: IMECE2022-99381

*Samarpan Chakraborty, Balakumar Balachandran, Kayo Ide - University of Maryland, College Park***N115. A Predictive Multisurface Approach to Damage Modeling in HCP Alloys**

NSF Poster Presentation: IMECE2022-99388

*Vigneshwaran Radhakrishnan, Amine Benzerga - Texas A&M University***N116. Forcebot: A Robotic Platform for Body-Scale Human Physical Interaction in Embodied Virtual Reality**

NSF Poster Presentation: IMECE2022-99415

*An-Chi He, Bhaben Kalita, Alexander Leonessa - Virginia Tech***N117. Mechanics-Driven Structural Design and Manufacturing of Electrical Sensing Based Microfluidic Biomedical Devices for Pain Management and Urinalysis**

NSF Poster Presentation: IMECE2022-99416

*Mengtian Yin, Baoxing Xu - University of Virginia***N118. Spectral Behavior of Horizontal-Axis Tidal Turbine in Elevated Levels of Homogeneous Anisotropic Turbulent Inflow**

NSF Poster Presentation: IMECE2022-99418

*Mohd Hanzla, Arindam Banerjee - Lehigh University***N119. Smart Bridge: Machine Learning to Identify Structural Defects of a Bridge and a Moving Vibration Source in Real-Time**

NSF Poster Presentation: IMECE2022-99419

*Shashwat Maharjan, Bruno Guidio, Chanseok Jeong - Central Michigan University***N120. Investigation of Thermal Properties of Activated Coconut Shell Polymeric Composite**

NSF Poster Presentation: IMECE2022-99708

*Emmanuel Aidoo - Southern University and A&M College***N121. Bactericidal Effects of Nanopillars: A Molecular Dynamics Study**

NSF Poster Presentation: IMECE2022-99659

*Akash Singh, Yumeng Li - University of Illinois***N122. An Electroacoustic Logic Element and Its Applications**

NSF Poster Presentation: IMECE2022-99677

Sai Aditya Raman Kuchibhatla, Michael Leamy - Georgia Institute of Technology

TRACK POSTER SECTION

WEDNESDAY, NOVEMBER 2

N123. Learner: System Architecture of an Upper Body Haptic Interface for High-Resolution Interaction With Virtual Environments

NSF Poster Presentation: IMECE2022-98529

*Connor Herron, Benjamin Beiter, Bhaben Kalita, Alexander Leonessa - Virginia Polytechnic Institute and State University***N124. Adaptable Hull Hydrodynamics Using Shape Morphing Curved-Crease Origami**

NSF Poster Presentation: IMECE2022-99685

*Hardik Patil, Evgueni Filipov - University of Michigan***N125. Local Resonance Bandgap Tunability in an Anisotropic Magnetorheological Metamaterial**

NSF Poster Presentation: IMECE2022-99687

*Mohammadreza Moghaddaszadeh - University at Buffalo (SUNY)**Andrew Ragonese, Yong Hu, Zipeng Guo, Amjad Aref, Chi Zhou, Shenqiang Ren, Mostafa Nouh - University at Buffalo (SUNY)***N126. A Novel Variable Stiffness Compliant Robotic Link Based on Discrete Variable Stiffness Units for Safe Human-Robot Interaction**

NSF Poster Presentation: IMECE2022-99599

*Jiaming Fu, Han Lin, Ziqing Yu, Dongming Gan - Purdue University***N127. Web-Based Applet in Simulating the Growth of Mycelium Network for Research and Educational Purpose**

NSF Poster Presentation: IMECE2022-99585

*Ruohan Xu, Zhao Qin - Syracuse University***N128. Grain Interface Functional Design to Create Damage Resistance in Polycrystalline Metallic Materials**

NSF Poster Presentation: IMECE2022-99588

*Manish Kumar, Sid Pathak - Iowa State University Ames**Curt A. Bronkhorst, Nan Chen - University of Wisconsin-Madison**Marko Knezevic - University of New Hampshire**William D. Musinsky, Manny Gonzales - Air Force Research Laboratory***N129. Suppression of Higher Acoustic Harmonics by Application of Solid-Solid Periodic Layered Structure**

NSF Poster Presentation: IMECE2022-99605

*Jinho Kang Arkadii Krokhin, Taeyoul Choi - University of North Texas**Heo Hyeonu - The Pennsylvania State University**Hyunjo Jeong - Wonkwang University***N130. Modeling Curvature-Resisting Surfaces of Soft Solid-Bilayer Hybrids**

NSF Poster Presentation: IMECE2022-99597

*Animesh Rastogi, Berkin Dortdivanlioglu - The University of Texas at Austin***N131. Improvement of Thermal Transport Across Graphene/polymer Interfaces With Hydrogen Bond and Polymer Brush**

NSF Poster Presentation: IMECE2022-99630

*Md. Mohaiminul Islam, Ling Liu - Temple University***N132. Allylic Bromination and Subsequent Polymer Grafting via ATRP to Control Macromolecular Architecture**

NSF Poster Presentation: IMECE2022-99634

*Vincent Torres, Robert Hickey - The Pennsylvania State University***N133. Repeated Mild Brain Injury Induced by Blast and Acceleration: A Comparative Study**

NSF Poster Presentation: IMECE2022-99829

*Sheida Vafadar, Hongbo Li, Soroush Assari, Dianne Langford, Sara J. Ward, Ronald F. Tuma, Kurosh Darvish - Temple University***N134. Investigation of Acoustic Pressure Patterning in Through-Wall Ultrasound Power Transfer Systems**

NSF Poster Presentation: IMECE2022-97029

Moustafa Sayed Ahmed, Ahmed Sallam, Shima Shahab - Virginia Tech

TRACK POSTER SECTION

WEDNESDAY, NOVEMBER 2

N135. Development of an Iep Apparatus for 3D Printing of Transverse Thermoelectric Devices

NSF Poster Presentation: IMECE2022-99798

*Weixiao Gao, Long Zhu, Fei Ren - Temple University***N136. Photo-Induced Spatiotemporal Bending of Shape Memory Polymers**

NSF Poster Presentation: IMECE2022-99804

*Boliang Wu, Yuzhen Chen, Lihua Jin - University of California, Los Angeles**Tianzhen Liu - Southeast University***N137. Self-Limiting Collision-Based Assembly of Monolayer on Polymer Substrates**

NSF Poster Presentation: IMECE2022-99881

*Liang Zhao, Bchara Sidnawi, Thomas Scully, Scott Dietrich, Qianhong Wu, Bo Li - Villanova University**Jichao Fan, Ruiyang Chen, Weilu Gao - The University of Utah***N138. Ceramic Fibers Derived From Organosilicon Polymers for Energy Storage**

NSF Poster Presentation: IMECE2022-99883

*Shakir Bin Mujib, Gurpreet Singh - Kansas State University***N139. Predicting Parametric Spatiotemporal Dynamics by Multi-Resolution Pde Structure-Preserved Deep Learning**

NSF Poster Presentation: IMECE2022-99732

Xin-Yang Liu, Jian-Xun Wang - University of Notre Dame
*Hao Sun - Renmin University of China***N140. Design De-Identification of Thermal History for Cross-System Process-Defect Modeling of Metal-Based Additive Manufacturing**

NSF Poster Presentation: IMECE2022-99733

*Durant Fullington, Wenmeng Tian - Mississippi State University***N141. Soft Contact Mechanics of Gradient-Stiffness Surfaces Under Indentation Loading: Simulation and Experiment**

NSF Poster Presentation: IMECE2022-99751

*Md. Mahmudul Hasan, Alison C. Dunn - University of Illinois at Urbana-Champaign***N142. Measurement of Contact Stiffness of Engineered Surface for Enriched and Novel Nonlinear Wave Propagation in Phononic Material**

NSF Poster Presentation: IMECE2022-99789

*Md. Kamruzzaman, Kathryn H. Matlack - University of Illinois at Urbana-Champaign***N143. Optical Properties of Halide Perovskite in Polymer Matrices**

NSF Poster Presentation: IMECE2022-99790

*Lindsay Jones, Yifan Xu, Robert Hickey - The Pennsylvania State University***N144. Length, Time, and Rate-Dependent Indentation Adhesion of Hydrogels**

NSF Poster Presentation: IMECE2022-99774

*Dongjing He, Yang Lai, Yuhang Hu - Georgia Institute of Technology***N145. Mechanisms of Force Transmission in Fiber Networks**

NSF Poster Presentation: IMECE2022-99536

*Mainak Sarkar, Jacob Notbohm - University of Wisconsin-Madison***N146. Differentiating Physical, Electrical, and Electrochemical Characteristics of 2D Materials (Graphite, GnP, and GO)**

NSF Poster Presentation: IMECE2022-99770

Sonjoy Dey, Gurpreet Singh - Kansas State University

TRACK POSTER SECTION

WEDNESDAY, NOVEMBER 2

N147. The Effect of Kinematics on the Design of Continuous Equilibrium Structures

NSF Poster Presentation: IMECE2022-99764

*Maria Redoutey, Evgueni Filipov - University of Michigan***N148. Ultra-Light Antennas via Charge Programmed Deposition Additive Manufacturing**

NSF Poster Presentation: IMECE2022-100212

*Zhenpeng Xu, Ryan Hensleigh, Junbo Wang, Anastasios Papathanasopoulos, Zhen Wang, Xiaoyu Zheng, Yahya, Rahmat-Samii - University of California, Los Angeles***N149. Strength-Based Topology Optimization Considering Multiple Materials**

NSF Poster Presentation: IMECE2022-100215

*Rahul Dev Kundu, Weichen Li, Xiaojia Shelly Zhang - University of Illinois at Urbana-Champaign***N150. Fw-Htf-P: Mitigating Risks in Future Police Work Through Social Telerobotic Communication**

NSF Poster Presentation: IMECE2022-100226

*Nader Jalili, Roya Salehzadeh - The University of Alabama***N151. Salt Hydrate Composites for Thermochemical Energy Storage in Buildings**

NSF Poster Presentation: IMECE2022-100358

*Erik Barbosa, Akanksha Menon - Georgia Institute of Technology***N152. A Multi-Physics Phase-Field Model for Studying Interaction Between Phase Transformation and Cracking in Shape Memory Ceramics**

NSF Poster Presentation: MECE2022-100272

*Amirreza Lotfolahpour, Mohsen Asle Zaeem - Colorado School of Mines***N153. Generating Multi-Pixel Thermal Images Through an Acoustic-Thermal Effect**

NSF Poster Presentation: IMECE2022-100057

*Teng Li - Mississippi State University**Zhenhua Tian - Virginia Polytechnic Institute and State University***N154. Statistical Microvoid Characterization at the Instance of Ductile Fracture in Steels**

NSF Poster Presentation: IMECE2022-100045

*Surajit Dey, Ravi Kiran - North Dakota State University***N155. Vector Density Continuum Dislocation Dynamics: Progress in Deformation Kinematics and Dislocation Kinetics**

NSF Poster Presentation: IMECE2022-100017

*Joseph Pierre Anderson, Khaled Abdelaziz, Vignesh Vivekanandan, Anter El-Azab - Purdue University***N156. Augmenting the Aw-Rascle-Zhang Traffic Flow Model With a Distributed Energy Equation**

NSF Poster Presentation: IMECE2022-99508

*Brian Block, Xiaoling Chen, Stephanie Stockar - The Ohio State University***N157. Biomimetic, Hierarchical Hydrogel Fibers With Independently Tunable Nano- and Micro Scale Ordering and Actuation Response**

NSF Poster Presentation: IMECE2022-99986

*Elisabeth Lloyd, Robert Hickey, Chao Lang - The Pennsylvania State University***N158. Untethered Control of Origami for Multimodal Locomotion and Deformation**

NSF Poster Presentation: IMECE2022-99990

Shuai Wu, Qiji Ze, Sophie Leanza, Renee Zhao - Stanford University

TRACK POSTER SECTION

WEDNESDAY, NOVEMBER 2

N159. Two-Temperature Time-Fractional Model for Electron-Phonon Coupled Interfacial Thermal Transport

NSF Poster Presentation: IMECE2022-100000

*Milad Mozafarifard, Yan Wang - University of Nevada, Reno***N160. SSA-CV-LOC: Towards Robust Multi-Agent Localization and Place Recognition in Uncertain Environments via Semantic World Understanding**

NSF Poster Presentation: IMECE2022-99904

*Azmyin Md. Kamal, Corina Barbalata - Louisiana State University***N161. A Hyper-Viscoelastic Model for Deformation Responses of Pre-Impregnated Tapes Under Processing Conditions**

NSF Poster Presentation: IMECE2022-99899

*Qingxuan Wei, Lu Li, Dianyuan Zhang - Purdue University***N162. Mechanics of Growth of the Primary Cell Walls of Fast-Growing Plants**

NSF Poster Presentation: IMECE2022-99968

*Anandu Nair Gopakumar, Debrup Chakraborty, Anamika Prasad, South Dakota State University***N163. The Fast Convolution-Based Method for the Peridynamic Form of Navier Stokes Equations**

NSF Poster Presentation: IMECE2022-100195

*Chad Alexander, Florin Bobaru - University of Nebraska-Lincoln***N164. Distance-Preserving Manifold Denoising for Data-Driven Mechanics**

NSF Poster Presentation: IMECE2022-100157

*Bahador Bahmani, Waiching Sun - Columbia University***N165. Convolutional Neural Network for Classification of Elements to Detect Multiple Voids in a 2D Plane Strain Solid Using Elastic Waves**

NSF Poster Presentation: IMECE2022-100159

*Fazle Mahdi Pranto, Chanseok Jeong - Central Michigan University***N166. Inverse Design of Magnetically Active Metasurfaces and Robots**

NSF Poster Presentation: IMECE2022-100141

*Chao Wang, Zhi Zhao, Xiaojia Shelly Zhang - University of Illinois at Urbana-Champaign***N167. A Multichannel Convolutional Neural Network Framework for Prediction of Damage Nucleation Sites in Microstructure**

NSF Poster Presentation: IMECE2022-99580

*Bruno Manoel Dobrovolski, Brandon Runnels - University of Colorado Colorado Springs***N168. Low-Velocity Impact Characterization of a Sandwich Panel With an Orthogrid-Stiffened Shape Memory Vitriimer Core**

NSF Poster Presentation: IMECE2022-100132

*Obed Tetteh, Patrick Mensah - Southern University and A&M College**Guoqiang Li - Louisiana State University***N169. Tuning Energy Transport in Helical Protein Nanotubes Through Side-Chain Modifications**

NSF Poster Presentation: IMECE2022-100155

*Jiayue Hu - Temple University***N170. Modeling Crack Initiation and Propagation in Electrodeposition Processes via Peridynamics**

NSF Poster Presentation: IMECE2022-100086

*Longzhen Wang, Florin Bobaru - University of Nebraska-Lincoln***N171. Multiscale Analysis of the Thermomechanical Fatigue Behavior of Additively Manufactured Metals**

NSF Poster Presentation: IMECE2022-100089

*Elisabeth Funck, Pouria Khanbolouki, John Lambros - University of Illinois at Urbana-Champaign
Eann Patterson, Chris Sutcliffe - University of Liverpool*

TRACK POSTER SECTION

WEDNESDAY, NOVEMBER 2

N172. Metamorphosis of Three Dimensional Modular Kirigami Tessellated Architected Matter

NSF Poster Presentation: IMECE2022-100040

*Yanbin Li, Jie Yin - North Carolina State University***N173. Standing Surface Acoustic Wave Enable Alignment of Nanomaterials in Hydrogel**

NSF Poster Presentation: IMECE2022-100061

*Jiali Li - Mississippi State University***N174. Fracture Mechanisms in Additive Manufactured 17-4 Steel**

NSF Poster Presentation: IMECE2022-100095

*Anik Das Anto, Ravi Kiran - North Dakota State University***N175. The Effect of Two-Way Shape Memory on the Healing of Poly (Ethylene-Co-Methacrylic Acid) and Polybutadiene Blend**

NSF Poster Presentation: IMECE2022-100096

*Emmanuel Igbokwe, Patrick Mensah - Southern University A&M College Baton Rouge LA.***N176. A Novel Discrete Variable Stiffness Actuator Based on a Reconfigurable Parallel-Beam Flexure Mechanism**

Poster Presentation: IMECE2022-100102

*Jiaming Fu, Ziqing Yu, Richard Voyles, George Chiu, Bin Yao, Dongming Gan - Purdue University***N177. Programming Magneto-Mechanical Responses Into Structures via Topology Optimization**

NSF Poster Presentation: IMECE2022-100111

*Zhi Zhao, Xiaojia Shelly Zhang - University of Illinois at Urbana-Champaign***N178. Full-Field Deformation Measurement in the Transmission Electron Microscope Using In Situ Digital Image Correlation and Particle Tracking**

NSF Poster Presentation: IMECE2022-99561

*Yiguang Zhang, John Lambros - University of Illinois at Urbana-Champaign**Shen Dillon - University of California, Irvine***N179. Integrating Fracture Nucleation and Propagation Into Optimization: Towards Materials With Enhanced Fracture Properties**

NSF Poster Presentation: IMECE2022-100112

*Yingqi Jia, Oscar Lopez-Pamies, Xiaojia Shelly Zhang - University of Illinois at Urbana-Champaign***N180. The Efficacy of Cellulose Fiber as Bacteria Carrier for Self-Healing of 3D Polymer Microstructures and Concrete**

NSF Poster Presentation: IMECE2022-100113

*Emmanuel Igbokwe, Patrick Mensah - Southern University Baton Rouge***N181. Kirigami-Inspired Universal Grippers With Programmable Morphology and Trajectory**

NSF Poster Presentation: IMECE2022-100107

*Yaoye Hong, Jie Yin - North Carolina State University***N182. Advanced In-Situ Fabrication of Nanofibers via a Modified Wet Electrospinning Method to Yield Polymer-Ceramic Nanocomposites**

NSF Poster Presentation: IMECE2022-99464

Yunzhi Xu, Ping Guo, Ange-Therese Akono - Northwestern University

TRACK POSTER SECTION

WEDNESDAY, NOVEMBER 2

16-02-01: Poster Session: NSF Research Experience for Undergraduates (REU), NSF Posters*Track Organizer: Po-hao Huang - University of Arkansas***12:00PM-4:00PM - Exhibit Hall D****N183. Ring Origami for Deployable Structures and Foldable Devices**

NSF Poster Presentation: IMECE2022-96531

*Sophie Leanza - The Ohio State University
Shuai Wu, Renee Zhao - Stanford University***N184. Non-Destructive Measurement of Optically Scattering Polymer Films Using Image Processing**

NSF Poster Presentation: IMECE2022-99430

*Noah McAllister, Maxim Arkhipov, Robert Green-Warren,
Assimina Pelegri, Jonathan Singer - Rutgers University
Jae-Hwang Lee - University of Massachusetts***N185. Utilization of Computational Fluid Dynamic Models to Quantify the Heat Generated Within Tissue From Electro-Osmotic Flow**

NSF Poster Presentation: IMECE2022-99983

*Jordan Grothe, Ashley Jorgensen, Mark Messerli,
Stephen Gent - South Dakota State University***N186. Modeling Distribution of Electric Field Through Human Tissue**

NSF Poster Presentation: IMECE2022-99979

*Lindsey Allen, Ashley Jorgensen, Stephen Gent, Mark
Messerli - South Dakota State University***N187. Void Detection in a Pml-Truncated Semi-Infinite Solid Material Using a Convolutional Neural Network**

NSF Poster Presentation: IMECE2022-99954

*Jacob Thomas, Bruno Guidio, Fazle Pranto, Shashwat
Maharjan, Chanseok Jeong - Central Michigan University***N188. A Quantitative Investigation of the Effectiveness of 3D-Printed Plastic Natural Convective Heatsinks Using Computational Fluid Dynamics**

NSF Poster Presentation: IMECE2022-100072

*Shyra LaGarde - Valdosta State University
Gregory Michna, Stephen Gent - South Dakota
State University***N189. Integration of Autofocus for Real-Time Monitoring of High-Precision Roll-to-Roll Printing Process**

NSF Poster Presentation: IMECE2022-99721

*Ahmed Elbashir, Jingyang Yan, Xian Du - University of
Massachusetts Amherst***N190. Defect Detection and Printed Pattern Measurement for Roll-to-Roll Microcontact Printing**

NSF Poster Presentation: IMECE2022-99712

*Ilya McCune-Pedit, Isabella Lambros, Meysam
Safarzadeh, Jixin Yin, Xian Du - University of
Massachusetts Amherst***N191. Investigation of In-Situ Compression Mechanisms for μ Cp Quality Control**

Poster Presentation: IMECE2022-99713

*Bella Lambros, Ilya Mccune-Pedit, Xian Du - University of
Massachusetts Amherst***N192. Methods for Controlling and Reducing Dendritic Growth of Sodium Azide Crystals**

NSF Poster Presentation: IMECE2022-99663

*Ismar Chew - Trine University
Colton Bruza, Patrick Simpson, John Lee -
John Brown University
Po-hao Huang - University of Arkansas***N193. Investigation on Acoustic Holographic Lenses for Low Intensity Transcranial Neuromodulation**

NSF Poster Presentation. IMECE2022-99682

*Eric Hoffmann, Ahmed Sallam, Shima Shahab -
Virginia Tech*

TRACK POSTER SECTION

WEDNESDAY, NOVEMBER 2

N194. Close-Loop Control of a Roll-to-Roll Gravure Printing Process

NSF Poster Presentation: IMECE2022-99642

*Ryan Packer, Jingyang Yan, Xian Du - University of Massachusetts Amherst***N195. Rapid Creation of Metamaterials With Prescribed Mechanical Behavior**

NSF Poster Presentation: IMECE2022-100235

*Desheng Yao, Chansoo Ha - University of California, Los Angeles***N196. Assessing the Performance of 3D Printed Heat Exchangers for Power Plants Using CFD**

NSF Poster Presentation: IMECE2022-99982

*Katherine Butler, Gregory Michna, Stephen Gent - South Dakota State University***TRACK 17****Track 17: Research Posters***Track Organizer: Po-Omid Askari - West Virginia University**Track Co-Organizer: Al Ratner - The University of Iowa**Track Co-Organizer: Reuben Kraft - Pennsylvania State University**Track Co-Organizer: Wenbin Yu - Purdue University***17-15-01: Society-Wide Micro/Nano Poster Forum****12:00PM–4:00PM - Exhibit Hall D****R200. Molecular Dynamics Analysis of Mode-Resolved Phonon Scattering by Embedded Nanoparticles**

Poster Presentation: IMECE2022-99961

*Theodore Maranets, Yan Wang - University of Nevada, Reno***R201. Computational Studies on Optimization of Printing Process Parameters via Multiphase Modeling of Droplet-Based Additive Manufacturing**

Poster Presentation: IMECE2022-99942

*Rauf Shah - Joint School of Nanoscience and Nanoengineering**Ram Mohan - North Carolina A&T State University***R202. Quasi-Liquid Surface With Patterned Wettability for Condensation**

Poster Presentation: IMECE2022-99735

*Dylan Boylan, Deepak Monga, Li Shan, Xianming Dai, Zongqi Guo - The University of Texas at Dallas***R203. Wood Converted Carbon and Its Application on Water Desalination and Supercapacitor**

Poster Presentation: IMECE2022-99851

*Rui He, Pei Dong - George Mason University**Yingchao Yang, Min Wang - University of Maine***R204. Prediction of Porosity and Its Mechanisms in Metal Additive Manufacturing**

Poster Presentation: IMECE2022-99652

*Nikhil Ingle, Ram Mohan - NC A&T State University***R205. Direct Thermal Emission Calculation and Validation of Kirchhoff's Law for Nonreciprocal Material Using Fluctuational Electrodynamics**

Poster Presentation: IMECE2022-99600

Chiyu Yang, Zhuomin Zhang, Wenshan Cai - Georgia Institute of Technology

TRACK POSTER SECTION

WEDNESDAY, NOVEMBER 2

R206. Rapid Macroscale Thermal Switching Based on Domain Wall Engineering in PMN-PT Single Crystals

Poster Presentation: IMECE2022-99692

*Ankit Negi, Hwang Pill Kim - North Carolina State University**Zilong Hua - Idaho National Lab**Yong Zhu, Xiaoning Jiang, Jun Liu - North Carolina State University***R207. On the Visualization of Localized Porous Media Deformation During an Indentation Process**

Poster Presentation: IMECE2022-99694

*Qifu Wang, Qiuyun Wang, Zenghao Zhu - Villanova University**Rungun Nathan - The Pennsylvania State University Berks**Gang Feng, Qianhong Wu - Villanova University***R208. Freezing Point Depression of Water in Calcium Chloride Solution Using Molecular Dynamic Simulations**

Poster Presentation: IMECE2022-99404

*Derek Scott, Lida Yan, Ganesh Balasubramanian - Lehigh University***R209. Exploring Polymer Thermal Conductivity Using Molecular Simulations and Machine Learning**

Poster Presentation: IMECE2022-99220

*Hanfeng Zhang, Ruimin Ma, Jiabin Xu, Tengfei Luo - University of Notre Dame***R210. 3D Printed Ceramic Hybrid Structures With High Porosity Using Direct Ink Writing Technology**

Poster Presentation: IMECE2022-99499

*Yun Li, Bo Li - Villanova University***R211. Dual-Step Sintering of Cu Nanoparticles With Femtosecond Laser**

Poster Presentation: IMECE2022-99553

*Janghan Park, Yaguo Wang - The University of Texas at Austin***R212. Experimental and Numerical Investigation of the Influence of Crack Front Orientation in Mode I Plane Strain Fracture Toughness of a Vero Material System via Polyjet Additive Manufacturing**

Poster Presentation: IMECE2022-99944

*Vishwanath Khapper, Ram Mohan - North Carolina Agricultural and Technical State University***R213. Ab Initio Modeling of Phonon Transport in Refractory Di-Silicides**

Poster Presentation: IMECE2022-99068

*Prince Sharma, Ganesh Balasubramanian - Lehigh University***R214. Design Transparent Radiative Cooler Using Machine Learning and Quantum Computing**

Poster Presentation: IMECE2022-99183

*Seongmin Kim, Seunghyun Moon - University of Notre Dame**Eungkyu Lee - Kyung Hee University**Tengfei Luo - University of Notre Dame***R215. A Steered Molecular Dynamics Study of Unbinding of Ritonavir and XK263 From HIV-1 Protein Binding Pocket**

Poster Presentation: IMECE2022-99131

Mohammad Akram, Tanumoy Banerjee, Ganesh Balasubramanian - Lehigh University

TRACK POSTER SECTION

WEDNESDAY, NOVEMBER 2

R216. A Steered Molecular Dynamics Study of Unbinding of Human Cell Receptors From SARS CoV-2 Viral Protein Receptor Binding Site

Poster Presentation: IMECE2022-99132

*Tanumoy Banerjee - Lehigh University
Agnivo Gosai - Corning Inc.**Niiloofar Yousefi, Craig Neal, Elyaraja Kolnathai, Ozlem Garibay, Sudipta Seal - University of Central Florida
Ganesh Balasubramanian - Lehigh University***R217. Examining the Hydration Behavior of Aqueous Calcium Chloride (CaCl₂) Solution**

Poster Presentation: IMECE2022-99113

*Lida Yan, Ganesh Balasubramanian - Lehigh University***R218. Fabrication and Testing of Polymer-Derived Non-Oxide Ceramic Matrix Composite Materials**

Poster Presentation: IMECE2022-99126

*Mohammed Rasheed, Shakir Bin Mujib, Gurpreet Singh - Kansas State University***R219. Exploring High Thermal Conductivity Polymer Blends via Data-Driven Approach**

Poster Presentation: IMECE2022-99101

*Jiaxin Xu, Hanfeng Zhang, Tengfei Luo - University of Notre Dame***R220. Physics-Informed Neural Networks for Solving Multiscale Time-Dependent Phonon Boltzmann Transport Equation**

Poster Presentation: IMECE2022-99938

*Jiahang Zhou, Ruiyang Li, Tengfei Luo - University of Notre Dame***R221. Repairable and Recyclable Assembled Monolayer on Polymer Substrates**

Poster Presentation: IMECE2022-99895

*Liang Zhao, Bo Li - Villanova University***R222. Monolayer MoSe₂/P3HT Hybrid Crystals for High-Performance Photoelectric Devices**

Poster Presentation: IMECE2022-100058

*Mingyuan Sun, Zhou Dong - Villanova University
Ningxin Li, Sidong Lei - Georgia State University
Bo Li - Villanova University***R223. Experimental Study of the Nano-Fin Effect (NFE) During Thin Film Evaporation From Nanopores in Anodic Aluminum Oxide (AAO) Membrane Substrates Integrated With Nano-Thermocouple/Thin Film Thermocouple (TFT) Array**

Poster Presentation: IMECE2022-100239

*Julie Shafer, Jonghyun Lee, Ashok Thyagarajan, Debjyoti Banerjee - Texas A&M University***R224. Design, Fabrication and Testing of a Novel Thermally-Actuated Tesla Valve (TATV): A Hybrid Microvalve**

Poster Presentation: IMECE2022-100251

*Jonghyun Lee, Ashok Thyagarajan, Debjyoti Banerjee - Texas A&M University***R225. Comprehensive Investigation of Phonon Scattering and Phonon Coherence in Nanomesh Structures**

Poster Presentation: IMECE2022-100227

*Haoran Cui, Tengfei Ma, Yan Wang - University of Nevada, Reno***R226. Lattice Thermal Transport Properties of Methane Hydrates From Deep Neural Network Interatomic Potentials**

Poster Presentation: IMECE2022-100225

Iyyappa Rajan Panneerselvam, Haoran Cui, Tengfei Ma, Yan Wang - University of Nevada Reno

TRACK POSTER SECTION

WEDNESDAY, NOVEMBER 2

17-01-01: Posters related to Acoustics, Vibration, and Photonics**R227. Employing Contactless Acoustic Thermometry for Additive Manufacturing: An Experimentally Verified Simulation Study**

Poster Presentation: IMECE2022-95434

*Khaoula Ettini, John Cotter, Rasim Guldiken - University of South Florida***R228. Study on the Flow-Induced Noise and Drag Reduction of a Cylinder Using Porous Materials**

Poster Presentation: IMECE2022-98809

*Koki Shige, Osamu Terashima, Taisei Kusano - Toyama Prefectural University***17-02-01: Posters related to Advanced Manufacturing****R229. Additive Manufacturing of the Novel Alumina-Based Ceramic-Metal Composite via Laser Powder-Bed Fusion**

Poster Presentation: IMECE2022-88339

*Mohammad Azami - Concordia University**Zahra Kazemi - University of Toronto Institute for Aerospace Studies**Amir Hadian - EMPA- Swiss Federal Laboratories for Materials Science and Technology***R230. Vibration-Based Nondestructive Evaluation of Bio-Printed Constructs Using Phase-Based Motion Estimation**

Poster Paper Publication: IMECE2022-95007

*Rayanne Taylor, Jinki Kim - Georgia Southern University***R231. Modeling of Selective Laser Melting (SLM) Process Using the Ansys Software**

Poster Presentation: IMECE2022-99358

*Anne Munyasia, Abiodun Fasoro, Ayodeji Fawole - Tennessee State University***R232. In-Situ Additive Manufacturing Monitoring Using Complementary Metal Oxide Semiconductor (CMOS) Technology**

Poster Presentation: IMECE2022-100213

*Ayodeji Fawole, Anne Munyasia, Abiodun Fasoro - Tennessee State University***R233. Human-Robot Communication in Collaborative Manufacturing**

Poster Presentation: IMECE2022-100219

*Nader Jalili, Roya Salehzadeh - The University of Alabama***R234. Microstructure Design of PCM Infiltrated Copper Composite Through Freeze Casting Method Toward Maximized Heat Absorption Rate**

Poster Presentation: IMECE2022-95593

*Christina Hoffman, Christopher Kasprzak, Ruey-Hung Chen - University of Maryland, Baltimore County**Ronghui Ma - University of Maryland***R235. Product Evaluation Methodology With Design for Disassembly - Example of Metro Train Car System**

Poster Presentation: IMECE2022-97112

*Devdas Shetty, Joseph Stilgenbauer, David Box Garcia - University of the District of Columbia***17-03-01: Posters Related to Advanced Materials: Design, Processing, Characterization and Applications****R236. Aerosol Jet Printed High-Performance Multifunctional Sensors for Simultaneous Temperature and Strain Sensing**

Poster Presentation: IMECE2022-100032

Qiang Jiang, Mortaza Saeidi-Javash, Stephanie Atampugre, Yanliang Zhang - University of Notre Dame

TRACK POSTER SECTION

WEDNESDAY, NOVEMBER 2

R237. A Comparative Study of Disk Wear Volume Evaluation of Al2024 Based on ASTM G99

Poster Paper Publication: IMECE2022-94625

*Jorge Salguero - University of Cadiz**Patricia Iglesias - Rochester Institute of Technology**Juan Manuel Vazquez-Martinez, Moises Batista, Irene Del Sol - University of Cadiz***R238. Design and Characterization of a Flexible Self-Inflating Mechanical Structure**

Poster Presentation: IMECE2022-95865

*Masoud Olia - Wentworth Institute of Technology**Hamid Nayeb-Hashemi, Soroush Kamrava, Milad Tatari - Northeastern University***R239. Experimental Characterization of Polymeric Materials Under Thermo-Oxidative Aging**

Poster Presentation: IMECE2022-98887

*Ben Jewell, Trisha Sain -**Michigan Technological University***R240. Metallized Three-Dimensional (3d) Printed Substrates for Advanced Antenna Applications**

Poster Presentation: IMECE2022-99474

*Daniel Yeboah, Fareed Dawan, Patrick Mensah - Southern University and A&M College***R241. Designing the Opto-Mechanical Properties of T. Flammea Exoskeletons for Resilient Photonic Materials**

Poster Presentation: IMECE2022-98925

*Rachel Hur, Chih-Hao Chang, Kun-Chieh Chien - The University of Texas at Austin***R242. Evaluation of Wear Performance in Metal-Filler-PTFE Composite**

Poster Presentation: IMECE2022-100151

*Faysal Haque - Miami University***17-04-01: Posters Related to Advances in Aerospace Technology****R243. Electrodynamic Conveying of Lunar Regolith**

Poster Presentation: IMECE2022-97046

*Priscilla Mendoza - The University of Texas at El Paso***R244. Simulation, Fabrication, and Experimentation of Levitating Three-Dimensional Structures**

Poster Presentation: IMECE2022-99540

*Thomas Celenza, Andy Eskenazi, Zhipeng Lu, Lorenzo Yao-Bate, Matthew Campbell, Igor Bargatin - University of Pennsylvania***R245. Electrodynamic Conveying of Lunar Regolith**

Poster Presentation: IMECE2022-95936

*Priscilla Mendoza - The University of Texas at El Paso**Aaron Olson, Krystal Acosta - NASA***R246. Minimizing Ground Effect for Photophoretic Force-Driven Mylar-Based Microflyers**

Poster Presentation: IMECE2022-99576

Zhipeng Lu, Miranda Stern, Jinqiao Li, David Candia, Lorenzo Yao-Bate, Thomas Celenza, Mohsen Azadi, Matthew Campbell, Igor Bargatin - University of Pennsylvania

TRACK POSTER SECTION

WEDNESDAY, NOVEMBER 2

17-05-01: Posters Related to Biomedical and Biotechnology**R247. Design and Development of a Bio-Chair to Facilitate Leg Rehabilitation Exercises**

Poster Presentation: IMECE2022-96292

*Sohail Zaidi, Linh An, Faizan Nomani, Vimal Viswanathan - San Jose State University**Pranav Bellannagari - IntelliScience Training Institute***R248. A Model of Dynamic Probe Insertion Using Hyperelastic Constitutive Modeling for Deep Brain Stimulation**

Poster Presentation: IMECE2022-99640

*Jennifer Muller, Siyu Chen, Wen Sang - Villanova University**Rungun Nathan - Penn State Berks**Chengyuan Wu - Thomas Jefferson University Hospital**Ani Ural, Qianhong Wu - Villanova University***R249. Micro Bioreactor Array for Bio-Artificial Organ Development**

Poster Presentation: IMECE2022-99679

*Maciej Lewicki, Sriharsha Sundarram - Fairfield University***17-06-01: Posters Related to Design, Systems and Complexity****R250. Pandora: An Affordable and Lightweight 3D-Printed Humanoid Research Platform**

Poster Presentation: IMECE2022-99389

*Alexander Fuge, Connor Herron, Bhaben Kalita, Alexander Leonessa - Virginia Tech***R251. Understanding Trade-Offs Between Digital & Physical Prototyping: Development and Assessment of a Design Process and Heuristics**

Poster Presentation: IMECE2022-99650

*Dan Jensen - Westmont College**Greg Reich - Air Force Research Labs**Jared Lush, Josh Guinto - Westmont College***R252. Exploring Overtrust, Undertrust, and Possible Mitigation Strategies in Autonomous Vehicle and Pedestrian Interaction**

Poster Presentation: IMECE2022-99709

*Marufa Islam, Jinjuan She, Jackson Clayton - Miami University***17-07-01: Posters Related to Dynamics, Vibration, and Control****R253. Adaptive Bistable Circuitry Network With Piezoelectric Transducers for Bifurcation-Based Mass Measurement**

Poster Paper Publication: IMECE2022-95720

*Jinki Kim - Georgia Southern University***R254. Experimental and Computational Analysis of Additively Manufactured Nonlinear Springs for Verification of a Predictive Model**

Poster Paper Publication: IMECE2022-96160

*Kyle Steel, Charisma Clarke, Edwar Romero-Ramirez, Gerardo Carbajal - Florida Polytechnic University***R255. Coupled Three-Blade and Tower Dynamics of Horizontal Axis Wind Turbines**

Poster Presentation: IMECE2022-99525

Bing Wu, Gizem Acar - Stevens Institute of Technology

TRACK POSTER SECTION

WEDNESDAY, NOVEMBER 2

17-08-01: Posters Related to Energy**R256. A Noncontact Magneto-Piezo Harvester-Based Vehicle Regenerative Suspension System: An Experimental Study**

Poster Presentation: IMECE2022-96938

*Saleh Alhumaid, Daniel Hess, Rasim Guldiken - University of South Florida***R257. Development of Combined Pyrolysis-Combustion Conceptual System for Auto-Thermal Process in Circulated Fluidized Bed Reactor**

Poster Presentation: IMECE2022-98928

*Byung Wook Hwang, Daewook Kim, Yujin Choi - Korea Institute of Energy Research**Doyeon Lee - Hanbat National University**Ho-Jung Ryu - Korea Institute of Energy Research**Hyungseok Nam - Kyungpook National University***R258. Catalytic Plastic Wastes Pyrolysis Fuel Upgrade/Separation and Its Combustion Application in 5kW Boiler**

Poster Presentation: IMECE2022-98931

*Doyeon Lee - Hanbat National University**Shuang Wang, Byung Wook Hwang, Hyungseok Nam - Korea Institute of Energy Research***R259. Ammonia Co-Firing Characteristics in a 100 kWth Circulating Fluidized Bed Combustion Test Rig**

Poster Presentation: IMECE2022-99198

*Seong-Ju Kim, Tae-Young Mun, Sung-Jin Park, Sung-Ho Jo, Sang Jun Yoon, Ji Hong Moon, Jae-Goo Lee - Korea Institute of Energy Research***R260. Hybrid 3 in 1 System Including Air-Staging, Flue Gas Recirculation, and Selective Non-Catalytic Reduction for Nox Reduction in Biomass Circulating Fluidized Bed Combustion**

Poster Presentation: IMECE2022-99252

*Tae-Young` Mun, Seong-Ju Kim, Sung Jin Park, Sung Ho Jo, Sang Jun Yoon, Ji Hong Moon, Jae-Goo Lee - Korea Institute of Energy Research***R261. Optimal Design and Fabrication Process of Membrane Electrode Assembly (MEA) for Proton Exchange Fuel Cell (PEMFC) Performance Using Experimental Method**

Poster Presentation: IMECE2022-99309

*Ramon Garcia, Hoe-Gil Lee - Tarleton State University***R262. Development of Phase Change Material Form Stabilization Technology for Manufacturing Heat Storage Building Materials**

Poster Presentation: IMECE2022-99603

*Jihong Moon, Jae-Deok Jeon, Soon Jin Kwon, Sang Shin Park, Sung-Jin Park, Sang Jun Yoon, Tae-Young Mun, Jae-Goo Lee - Korea Institute of Energy Research***R263. 8 MWth Commercial Unused Biomass Gasifier Development and Demonstration**

Poster Presentation: IMECE2022-99769

*Sung Jin Park, Seong-Ju Kim - Korea Institute of Energy Research**Soo Hwa Jeong, Uen Do Lee - Korea Institute of Industrial Technology**Tae-Young Mun, Sang Jun Yoon, Jae-Goo Lee, Ho Won Ra, Sung Min Yoon, Ji Hong Moon - Korea Institute of Energy Research***R264. CFD Analysis of Various Flow Channels and Parameters in a Proton Exchange Membrane Fuel Cell**

Poster Presentation: IMECE2022-100222

*Dakota Messer - Tarleton State University***17-09-01: Posters related to Engineering Education****R265. Experimental Assessing of the Energy Transformation in Turns**

Poster Paper Publication: IMECE2022-88319

*Frank Otremba - Federal Institute for Material Research and Testing**Jose A. Romero Navarrete - Queretaro Autonomous University*

TRACK POSTER SECTION

WEDNESDAY, NOVEMBER 2

R266. Transactional Analysis Training for Improving Engineering Graduate Students' Abilities to Understand Different Personalities

Poster Paper Publication: IMECE2022-95284

*Pawan Tyagi - University of the District of Columbia***R267. The Discuss Model and Assessment of Student Learning**

Poster Presentation: IMECE2022-98922

*Mysore Narayanan - Miami University***R268. Learner-Centered Portfolio and Assessment**

Poster Presentation: IMECE2022-98941

*Mysore Narayanan - Miami University***R269. Alabama IMADE Modular Courses With Hands-on Activities for an Undergraduate Degree in Manufacturing Systems Engineering**

Poster Presentation: IMECE2022-100236

*Roya Salehzadeh, Soroush Korivand, Gustavo Martins Galvani, Radley Scott, Nader Jalili - The University of Alabama***17-11-01: Posters Related to Heat Transfer and Thermal Engineering****R270. Experimental Investigation on Natural Convection of Hybrid-Water Nanofluids in Cavity Flow**

Poster Presentation: IMECE2022-98976

*Temiloluwa Olatunji Scott, Daniel Raphael Ejike Ewim - Durban University of Technology**Andrew Eloka-Eboka - North West University***R271. A Numerical Methodology to Predicting Fire Dynamics and Structural Response Caused by Thermal Runaway in a Constrained Li-Ion Battery Pack**

Poster Presentation: IMECE2022-99796

*Rajib Mahamud - Idaho State University**Peter Parrish, Jr. - The State University of New York at Canton**Tousif Sadman - Bangladesh University of Engineering and Technology**Mohammad Nahid - FCA Fiat Chrysler Automobiles**Ali Ashraf - The University of Texas Rio Grande Valley**Kibria K. Roman - The State University of New York at Canton***R272. Broadband Nonreciprocal Emission and Absorption Using Epsilon-Near-Zero Metamaterial**

Poster Presentation: IMECE2022-99870

*Zhenong Zhang, Linxiao Zhu - The Pennsylvania State University***R273. Transition of Thermal Behavior in Graphite Under High Pressure**

Poster Presentation: IMECE2022-100014

*Zefang Ye, Yaguo Wang - The University of Texas at Austin***17-12-01: Posters Related to Mechanics of Solids, Structures, and Fluids****R274. Application and Detection of Nonlocal Calibration Parameters for Size-Dependent Inhomogeneous Beams**

Poster Presentation: IMECE2022-96561

*Piotr Jankowski - Bialystok University of Technology***R275. A New Crystal Plasticity Modeling Framework for Fully Implicit Time Integration of Coupled Phase Transformation and Slip in Shape Memory Alloys**

Poster Presentation: IMECE2022-99809

Rupesh Kumar Mahendran, Surya R. Kalidindi, Aaron Stebner - Georgia Institute of Technology

TRACK POSTER SECTION

WEDNESDAY, NOVEMBER 2

R276. Modeling Electric Vehicle Battery Packs Using Multi-Scale Computational Homogenization Approach

Poster Presentation: IMECE2022-100092

*Shantanu Ramesh Shinde, Elham Sahraei, Yihan Song - Temple University***17-13-01: Posters Related to Micro- and Nano-Systems Engineering and Packaging****R277. Nanomechanical Measurements of the Interfacial Strength of Boron Nitride Nanotube-Reinforced Metal Nanocomposites**

Poster Presentation: IMECE2022-99503

*Yingchun Jiang, Zihan Liu, Chenglin Yi - State University of New York at Binghamton**Ning Li - University of Illinois at Urbana-Champaign**Soumendu Bagchi - Los Alamos National Laboratory**Huimin Zhou - State University of New York at Binghamton**Cheol Park - NASA Langley Research Center**Huck Beng Chew - University of Illinois at Urbana-Champaign**Changhong Ke - State University of New York at Binghamton***R278. Fabrication of Copper-Coated Electrospun Carbon Nanofiber Mat Through Electrodeposition Using a Non-Polar Electrolyte**

Poster Presentation: IMECE2022-99981

*Mohammad Uddin, Ajit Kelkar, Ram Mohan - North Carolina A&T State University***R279. A Theoretical and Experimental Study of an Oscillatory Flow Through a Compliant Tube**

Poster Presentation: IMECE2022-100010

*Bchara Sidnawi, Siyu Chen, Qifu Wang - Villanova University**Rungun Nathan - Penn State University**Qianhong Wu - Villanova University***R280. Kapton Polyimide Based Laser Engraved Graphene Sensor for Electrochemical Detection of Dopamine**

Poster Presentation: IMECE2022-100056

*Dipannita Ghosh, Md. Ashiqur Rahman, Ali Ashraf, Nazmul Islam - The University of Texas Rio Grande Valley***R281. Dielectric Comparison for Paper-Like Surface Dielectric Barrier Discharge Devices**

Poster Presentation: IMECE2022-100075

*Stephen Mclaughlin - Rutgers University**Duncan Trosan, Qingyang Wang - North Carolina State University**Ramendra Pal - Rutgers University**Deepti Salvi, Katharina Stapelmann - North Carolina State University**Aaron Mazzeo - Rutgers University***17-14-01: Posters Related to Safety Engineering, Risk and Reliability Analysis****R282. A Study on Thermal and Flow Characteristics of Combustible Metals**

Poster Presentation: IMECE2022-98758

*Junsik Lee, Ki-Hun Nam - Changshin Univeristy***R283. Systems With Cryogenic Liquefied Gases in Fire-Incidents**

Poster Presentation: IMECE2022-99018

*Robert Eberwein - Bundesanstalt für Materialforschung und -prüfung**Giordano Emrys Scarponi, Alessandro Dal Pozzo - University of Bologna**Frank Otremba - Bundesanstalt für Materialforschung und -prüfung***R284. A Machine Learning Framework for Physics-Based Multi-Fidelity Modeling and Health Monitoring**

Poster Presentation: IMECE2022-99739

Gaurav Makkar - Rensselaer Polytechnic Institute

Technical Program at a Glance

***Please see the conference app for the most up to date information*



TECHNICAL PROGRAM AT A GLANCE

Monday, October 31								
Room	PG	9:45am–10:30am	PG	10:45am–12:30pm	PG	2:00pm–3:45pm	PG	4:00pm–5:45pm
C151			75	02-01-01: 7th Annual Conference-Wide Symposium on Additive Manufacturing: Metals I	78	02-01-02: 7th Annual Conference-Wide Symposium on Additive Manufacturing: Metals II	81	02-01-03: 7th Annual Conference-Wide Symposium on Additive Manufacturing: Polymers I
D180			76	02-02-01: Session #1: Measurement	79	02-02-02: Session #2: Measurement Science, Sensors, Non-destructive Evaluation (NDE) and Process Control for Advanced Manufacturing	83	02-15-01: Sustainable Manufacturing
D181			76	02-06-01: Session #1: Advanced Material	80	02-06-02: Session #2: Advanced Material Forming and Measurement of Advanced Manufacturing Processes	82	02-16-01: Manufacturing: General
D182			103	03-05-01 Design, Material Processing, and Applications of Polymer Composites	105	03-05-02: Design, Material Processing, and Applications of Epoxy Composites	109	03-05-03: Design, Material Processing, and Applications of Metal and Ceramic Composites
D183			104	03-23-01: Dynamics of Advanced	106	03-13-01: Multifunctional Electronics and Energy Devices	109	03-34-01: Nanomaterials for Energy
A210/A211	51	Track 5 Plenary Session I	105	03-15-01: Mechanics of Low Dimensional	107	03-07-01: Material Processing of Flexible/Emerging Electronics, Sensors, and Devices I	110	03-07-02: Material Processing and Mechanics of Flexible/Emerging Electronics, Sensors, and Devices II
A212/A213	57	Track 11 Plenary Session I	134	05-01-01: Injury Mechanisms and Analyses	135	05-09-01: Computational Modeling in Biomedical Applications I	138	05-04-01: Biomaterials and Tissue: Modelling, Synthesis, Fabrication and Characterization - I
A214/A215	25	Plenary: Building SpinLaunch: An Inside Look at the Engineering	133	05-02-01: Vibration and Acoustics in Biomedical Applications	136	05-05-01 Biomedical Device - I	140	05-06-01: Dynamics and Control of Biomechanical Systems
A216	46	Track 2 Plenary Session I	133	05-08-01: Biotransport (Fluid, Heat and Mass)	137	05-10-01: Musculoskeletal and Sports Biomechanics - I	139	05-11-01: Sensors and Actuators - I
A220			77	02-10-01: Session #1: Robotics and Automation in Advanced Manufacturing	79	02-10-02: Session #2: Robotics and Automation in Advanced Manufacturing	81	02-05-01: Session #1: 7th Symposium on Fastening and Joining Research and Advanced Technology
A221			180	08-01-01: Electrochemical Energy Storage and Conversion System I	182	08-14-01: Photovoltaic	184	08-06-01: Design and Analysis of Energy Conversion Systems I
A222			181	08-01-02: Electrochemical Energy Storage and Conversion System II	182	08-14-02: Solar Thermal	185	08-06-02: Design and Analysis of Energy
A223			181	08-02-01: Advanced Modeling of Electrochemical Materials I	183	08-14-03: Emerging Technologies in Solar Energy	222	11-03-01: Heat Transfer in Batteries and Energy Storage Technologies



TECHNICAL PROGRAM AT A GLANCE

Room	PG	9:45am–10:30am	PG	10:45am–12:30pm	PG	2:00pm–3:45pm	PG	4:00pm–5:45pm
A224			218	11-44-01: Heat and Mass Transfer for Renewable Energy Conversion Processes	221	11-45-01: Applications of Computational Heat Transfer	222	11-48-01: Application of Machine
A225			219	11-52-01: Computational Thermal/Fluids	221	11-46-01: Methods and Algorithms in Computational Heat Transfer	223	11-02-01: Heat Transfer Engineering Leveraging Additive Manufacturing and Topology Optimization
B230/B231	59	Track 12 Plenary Session I	218	11-01-01: Heat and Mass Transfer in Heating, Cooling, and Power Systems	220	11-01-02: Heat and Mass Transfer in Heating, Cooling, and Power Systems	247	12-13-01: Modeling and Experiments in Nanomechanics and Nanomaterials
B232			239	12-12-01: Mechanical Metamaterials	242	12-12-02: Mechanical Metamaterials	246	12-12-03: Mechanical Metamaterials
B234			241	12-07-01: Mechanics of Soft Materials	245	12-07-02: Mechanics of Soft Materials	248	12-07-03: Mechanics of Soft Materials
B235			242	12-02-01: Modeling of the Fracture, Failure and Fatigue in Solids	244	12-02-02: Modeling of the Fracture, Failure and Fatigue in Solids	246	12-02-03: Modeling of the Fracture, Failure and Fatigue
B242/B243			240	12-16-01: Drucker Medal Symposium	243	12-16-02: Drucker Medal Symposium	249	12-16-03: Drucker Medal Symposium
B244/B245			239	12-09-01: Multiphysics Simulations and Experiments for Solids	244	12-09-02: Multiphysics Simulations and Experiments for Solids	250	12-11-01: Perspective on Fracture and Failure Mechanics
A226	55	Track 8 Plenary Session I	135	05-15-01: General Biomedical and Biotechnology Topics - I	138	05-15-02: General Topics in Biomedical and Biotechnology - II	224	11-15-01: Topics in Heat Transfer
C160A							141	05-15-03: General Topics in Biomedical and Biotechnology - III



TECHNICAL PROGRAM AT A GLANCE

Tuesday, November 1								
Room	PG	9:15am–10:00am	PG	10:15am–12:00pm	PG	1:30pm–3:15pm	PG	3:30pm–5:15pm
C151			65	01-01-01: General Phononics	66	01-01-02: Topological Phononics	68	01-01-03: Applied Phononics
D180			66	01-03-01: Passive, Semi-Active, and Active Noise and Vibration	67	01-02-01: General	68	01-10-01: Flow-Induced Noise and Vibration Count
D181			84	02-01-04: 7th Annual Conference-Wide	86	02-01-05: 7th Annual Conference-Wide Symposium on Additive Manufacturing: Unique Applications I	88	02-01-06: 7th Annual Conference-Wide Symposium on Additive Manufacturing: Unique Applications II
D182			84	02-03-01: Session #1: Nanomanufacturing: Novel Processes, Applications, and Process-Property Relationships	86	02-03-02: Session #2: Nanomanufacturing: Novel Processes, Applications, and Process-Property Relationships	89	02-04-01: Session #1: Advanced Machining and Finishing Processes
D183			85	02-07-01: Session #1: Innovative Product	87	02-07-02: Session #2: Innovative Product and Process Design	89	02-14-01: 3D/4D BioManufacturing, BioMaterials, & Computational Modeling
A210/A211	45	Track 1 Plenary Session I	112	03-27-01: Materials Processing and Characterization - I	114	03-27-02: Materials Processing and Characterization - II	117	03-27-03: Materials Processing and Characterization - III
A212/A213	48	Track 3 Plenary Session I	111	03-18-01: Bio-inspired and biomedical materials and devices	113	03-20-01: Multifunctional and Architected Composites	115	03-11-01: Manufacturing, Integration and Characterization of Multifunctional Structure and Devices
A214/A215	51	Track 5 Plenary Session II	111	03-03-01: Integrated Computational	113	03-01-01: Mechanics of Penetration, Shockwaves, and High-Strain-Rate Events: Modeling and Experiments	116	03-02-01: Modeling and Experimentation of Geomaterials
A216	52	Track 6 Plenary Session II	143	05-01-02: Injury and Damage	144	05-09-02: Computational Modeling in Biomedical Applications - II	147	05-11-02: Sensors and Actuators - II
A220			142	05-12-01: Robotics, Rehabilitation - I	146	05-05-02 Biomedical Devices - II	146	05-10-02: Musculoskeletal and Sports Biomechanics - II
A221			142	05-04-02: Biomaterials and Tissue: Modelling, Synthesis, Fabrication and Characterization - II	145	05-01-03: Injury and Damage Biomechanics: Mechanisms across the Body	155	06-04-01 Design for AM
A222			153	06-02-01 CAD/CAM	154	06-01-02 Product And Process Design	163	07-04-01: Fluid Structure Interaction I
A223			161	07-02-01: Nonlinear Dynamics, Control, and Stochastic Mechanics	162	07-01-01: General Dynamics, Vibration, and Control Count	164	07-01-02: General Dynamics, Vibration, and Control Count
A224			161	07-03-01: Design and Control of Robots, Mechanisms and Structures	163	07-03-02: Design and Control of Robots, Mechanisms and Structures	165	07-03-03: Design and Control of Robots, Mechanisms and Structures
A225			186	08-13-01: Outstanding Early-Career Investigators in Energy Conversion and Storage Systems	187	08-03-01: Energy-Related	189	08-16-01: Emerging Renewable Energy Technologies I



TRACK PLenary SESSIONS A GLANCE

Room	PG	9:15am–10:00am	PG	10:15am–12:00pm	PG	1:30pm–3:15pm	PG	3:30pm–5:15pm
B230/B231	58	Track 12 Plenary Session I	186	08-04-01: Fundamentals and Applications of Thermodynamics	188	08-03-02: Energy-Related	190	08-16-02: Emerging Renewable Energy Technologies II
B232			206	10-02-01: Fundamental Issues and Perspectives in Fluid Mechanics	206	10-03-01: CFD Applications - I	207	10-05-01: Multiphase Flows
B234			225	11-04-01: Nanoscale Measurements of Thermophysical Properties	226	11-05-01: Techniques Development for Thermophysical Characterization	228	11-07-01: Thermophysical Properties Measurement and Modeling
B235			225	11-08-01: Fundamentals of Phase-Change Including Micro/Nanoscale Effects-Boiling, Evaporation, Freezing and Condensation	226	11-08-02: Fundamentals of Phase-Change Including Micro/Nanoscale Effects-Boiling, Evaporation, Freezing and Condensation	227	11-08-03: Fundamentals of Phase-Change Including Micro/Nanoscale Effects-Boiling, Evaporation, Freezing and Condensation
B242/B243			251	12-08-01: Peridynamic Modeling of Materials' Behavior	253	12-07-04: Mechanics of Soft Materials	255	12-07-05: Mechanics of Soft Materials
B244/B245			252	12-22-01: Advances in Topology Optimization	255	12-19-01: Emerging Topology and Shape Optimization Techniques in Computational Design of Materials and Structures	256	12-19-02: Emerging Topology and Shape Optimization Techniques in Computational Design of Materials and Structures
A226	53	Track 7 Plenary Session I	251	12-16-04: Drucker Medal Symposium	254	12-14-01: CONCAM Distinguished Lectures on Computational Mechanics	257	12-14-02: CONCAM Distinguished Lectures on Computational Mechanics
C160A				NSF Proposal Development Workshop	254	12-16-05: Drucker Medal Symposium		



TECHNICAL PROGRAM AT A GLANCE

Wednesday, November 2								
Room	PG	9:45am–10:30am	PG	10:45am–12:30pm	PG	2:00pm–3:45pm	PG	4:00pm–5:45pm
C151			69	01-01-04: Elastic and Acoustic Metamaterial	71	01-04-01: Analytical and Computational Acoustics and Vibrations	71	01-08-01: Vibration and Acoustic Measurements, Signal Processing, and Test Facilities
D180			69	01-13-01: Congress-Wide Symposium on NDE & SHM: Computational Nondestructive Evaluation and Structural Health Monitoring Count	70	01-14-01: Wave Propagation in Heterogenous and Architected Media	93	02-12-01: Session #1: Digital Manufacturing Process Simulation and Validation
D181			90	02-01-07: 7th Annual Conference-Wide Symposium on Additive Manufacturing: Composites/Ceramics	91	02-08-01: Session #1: Computational Modeling and Simulation for Advanced Manufacturing	92	02-08-02: Session #2: Computational Modeling and Simulation for Advanced Manufacturing
D182			156	06-01-01 Product And Process Design	157	06-03-01 Optimization	158	06-07-01- Sustainable design
D183			118	03-09-01: High Temperature Materials	119	03-09-02: Inverse Design of Metamaterials	121	03-09-03: Design of Engineering Materials
A210/A211	54	Track 7 Plenary Session II	118	03-04-01: Modeling and Experiments in Nanomechanics and Nanomaterials	120	03-24-01: Nanoengineered, Nano Modified, Hierarchical, Multi-Scale Materials, and Structures	121	03-28-01: Joint Session on Recent Advances in Advanced Materials Processing and Tribology
A212/A213	49	Track 3 Plenary Session II	124	04-03-01: (04-03: Novel Aerospace Propulsion Systems & 04-20: Unmanned Aircraft Systems (UAS): Propulsion, Energy and Applications)	126	04-04-01: (04-04: Advances in Aerospace Structures and Materials & 04-11: Advances in Mechanics, Multiscale Models and Experimental Techniques for Composites)	126	04-01-01: (04-01: General Aerospace, 04-02: Advances in Aerodynamics & 04-19: Green Aviation)
A214/A215	50	Track 4 Plenary Session I	148	05-01-04: Injury and Damage Biomechanics: Spine and Vertical Loading	149	05-12-02: Robotics, Rehabilitation - II	151	05-03-01: General Topics in Biomedical and Biotechnology Covering: Biomedical Imaging, Therapy and Tissue Characterization; Clinical Applications of Bioengineering
A216	57	Track 11 Plenary Session II	148	05-09-03: Computational Modeling in Biomedical Applications - III	150	05-01-05: Injury and Damage	151	05-14-01: Biotechnology and General Applications
A220			166	07-22-01: Industrial Applications in Dynamics, Vibrations and Control	167	07-01-03: General Dynamics, Vibration, and Control Count / Nonlinear Dynamics, Control, and Stochastic Mechanics	170	07-04-02: Fluid Structure Interaction / Marine Electromechanical Systems and Ocean Mechatronics
A221			166	07-03-04: Design and Control of Robots, Mechanisms and Structures	168	07-03-05: Design and Control of Robots, Mechanisms and Structures	170	07-06-01: Smart Structures and Structronic Systems: Sensing, Energy Generation / Renewable Energy, Structural Health Monitoring, and Distributed



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A222			191	08-10-01: Nuclear Energy: Plants, Design, Analysis and Safety	192	08-05-01: 4E Analysis and Optimization of Energy Systems	194	08-09-01: Thermal Energy Storage
A223			191	08-11-01: CMS-General Combustion and Fire	193	08-07-01: Energy Systems Components	193	08-15-01: Wind and Water Power
A224			196	09-01-01: Curriculum Innovations, Pedagogy and Learning Methodologies	197	09-01-02: Curriculum Innovations, Pedagogy and Learning Methodologies	199	09-02-01: Accreditation, Globalization, Ethics and Safety of Engineering
A225			196	09-04-01: Fluid Mechanics, Aerospace, Thermodynamics, Heat Transfer, and Energy Systems	198	09-04-02: Fluid Mechanics, Aerospace, Thermodynamics, Heat Transfer, and Energy Systems	209	10-07-01: Fluids Measurements
B230/B231			208	10-03-02: CFD Applications - II	208	10-06-01: Industrial Flows - I	271	13-04-01: Applied Mechanics and Materials in Micro- and Nano-Systems
B232			269	13-01-01: Design and Fabrication, Analysis, Processes, and Technology for Micro and Nano Devices and Systems	270	13-01-02: Design and Fabrication, Analysis, Processes, and Technology for Micro and Nano Devices and Systems	271	13-05-01: Advanced Manufacturing of Microsystems, Microstructures, and Miniaturized Actuators
B234			279	14-01: General Topics on Risk, Safety, and Reliability	280	14-04: Reliability and Safety in Transportation Systems	281	14-06: Machine Learning for Safety, Reliability, and Maintenance
B235			230	11-13-01: Thermal Transport in Solids	231	11-16-01: Nanoscale Phase Change Heat Transfer	232	11-26-01: Topics in Combustion and Fire
B242/B243			229	11-17-01: Radiative Properties of Nanostructures	232	11-17-02: Radiative Properties of Nanostructures	233	11-18-01: Nanoscale Radiative and Tunable Heat Transfer
B244/B245			257	12-20-01: Instabilities in Solids and Structures	258	12-20-02: Instabilities in Solids and Structures	258	12-20-03: Instabilities in Solids and Structures
A226	60	Track 13 Plenary Session I	230	11-15-01: Topics in Heat Transfer	279	14-08-01: Crashworthiness, Occupant Protection, and Biomechanics	282	14-08-02: Crashworthiness, Occupant Protection, and Biomechanics and Extended Topics in Energy Systems
C160A					198	09-08-01: General Topics in Engineering Education	169	07-03-06: Design and Control of Robots, Mechanisms and Structures



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C151				02-08-03: Session #3: Computational Modeling and Simulation for Advanced Manufacturing	96	02-08-04: Session #4: Computational Modeling and Simulation for Advanced Manufacturing	98	02-09-02: Session #2: Variation Simulation and Design for Assembly Description
D180				02-09-01: Session #1: Variation Simulation and Design for Assembly Description	97	02-12-02: Session #2: Digital Manufacturing Process Simulation and Validation	99	02-12-03: Session #3: Digital Manufacturing Process Simulation and Validation
D181				02-11-01: Session #1: Laser-Based Advanced Manufacturing and Materials Processing	97	02-11-02: Session #2: Laser-Based Advanced Manufacturing and Materials Processing	100	02-12-04: Session #4: Digital Manufacturing Process Simulation and Validation
D182				04-08-01: (04-08: Dynamics and Control of Aerospace Structures & 04-13: Computational Aerospace Structural Dynamics and Aeroelasticity)	128	04-10-01 (04-10: Impact, Damage and Fracture of Composite Structures & 04-14: Nonlinear Problems in Aerospace Structures)	129	04-05-01: (04-05: Beam, Plate, and Shell Structures & 04-06: Lightweight Sandwich Composites and Layered Structures)
D183				04-12-01: Peridynamics Modeling I	129	04-17-01: Applications of Artificial Intelligence/Machine Learning in Aerospace Engineering I	130	04-16-01: (04-16: Advanced Manufacturing in Aerospace Engineering & 04-15: Congress-Wide Symposium on NDE & SHM – NDE and Prognostics in Structural Applications)
A210/A211	47	Track 2 Plenary Session II	47	07-10-01: Mobile Robots and Unmanned Ground Vehicles	174	07-10-02: Mobile Robots and Unmanned Ground Vehicles	176	07-07-01: Novel Control of Dynamic System and Design
A212/A213	61	Track 13 Plenary Session II	61	07-17-01: Machine Learning and Artificial Intelligence in Dynamics, Vibrations and Control	174	07-09-01: Vibrations of Continuous Systems	177	07-11-01: Control Theory and Applications / Dynamics and Control of Soft Structures 09-06-02: Teaching Laboratories, Hands-on Experiences, Embedding Novel Manufacturing Concepts in ME Programs, and Technology-Aided Lecturing
A214/A215	50	Track 4 Plenary Session II	50	07-12-01: Optimization, Uncertainty and Probability / Modelling and Design Advances of Rotating Structures / Congress-Wide Symposium on NDE & SHM: Dynamics, Vibration, and Control for Structural Health Monitoring Applications	201	09-06-01: Teaching Laboratories, Hands-on Experiences, Embedding Novel Manufacturing Concepts in ME Programs, and Technology-Aided Lecturing	202	09-06-02: Teaching Laboratories, Hands-on Experiences, Embedding Novel Manufacturing Concepts in ME Programs, and Technology-Aided Lecturing
A216	55	Track 9 Plenary Session I	55	09-03-01: Applied Mechanics, Dynamic Systems, and Control Engineering	200	09-05-01: Distance/Online, Problem Solving, Research Methodologies, Models and Enabling Technologies in Engineering Education	203	09-07-01: Pre-College (K-12) STEM, RET, University Industry Alliance, Research Innovation and Experiences for Undergraduates
A220				10-04-01: Fluid Engineering in Micro- and Nano-systems	212	10-01-01: Micro and Nano-Scale Phenomena in Nonlinear Materials and Complex Fluids	214	10-08-01: Fluid Engineering Applications



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A222				13-02-01: Applications of Micro and Nano Systems in Medicine and Biology	274	13-02-02: Applications of Micro and Nano Systems in Medicine and Biology	277	13-02-03: Applications of Micro and Nano Systems in Medicine and Biology
A223				13-03-01: Micro and Nano Devices	276	13-03-02: Micro and Nano Devices	276	13-06-01: Microfluidics 2022
A224				14-05-01: Models and Methods for Probabilistic Risk Analysis	284	14-05-02: Models and Methods for Probabilistic Risk Analysis	285	14-10-01: Users, Technology, and Human Reliability in Safety Engineering
A225				14-12: Developments in Design Theory for Component and System Safety and Reliability	235	11-21-01: Single- and Multi-Phase Heat Transfer Equipment	236	11-29-01: Aerospace Heat Transfer
B230/B231	56	Track 10 Plenary Session I	56	11-10-01: Fundamentals of Radiative Transport and Conduction Including Micro/Nanoscale Effects	234	11-11-01: Machine Learning in Nanoscale Thermal Transport	236	11-14-01: Molecular Dynamics Simulation of Thermal Transport in Nanostructures or Across Interface
B232				12-04-01: Multiscale Models and Experimental Techniques for Composite Materials and Structures	263	12-06-01: Data-Driven Modeling and Simulation for Computational Biomedicine	268	12-17-01: Computational Methods in Heterogeneous Porous Media
B234				12-01-01: Fracture and Failure of Reinforced Polymer Matrix Composite Materials	263	12-01-02: Fracture and Failure of Reinforced Polymer Matrix Composite Materials	266	12-03-01: Mechanics and Design of Cellular Materials
B235				12-05-01: Data-Enabled Predictive Modeling, Scientific Machine Learning, and Uncertainty Quantification in Computational Mechanics	265	12-05-02: Data-Enabled Predictive Modeling, Scientific Machine Learning, and Uncertainty Quantification in Computational Mechanics	267	12-05-03: Data-Enabled Predictive Modeling, Scientific Machine Learning, and Uncertainty Quantification in Computational Mechanics
B242/B243				12-15-01: Dynamic Failure of Materials & Structures	265	12-21-01: General: Mechanics of Solids, Structures and Fluids	266	12-21-02: General: Mechanics of Solids, Structures and Fluids
B244/B245				12-18-01: Functional Origami and Kirigami-inspired Structures and Metamaterials	264	12-18-02: Functional Origami and Kirigami-inspired Structures and Metamaterials	130	04-17-02: (04:17: Applications of Artificial Intelligence/ Machine Learning in Aerospace Engineering II & 04-12: Peridynamics Modeling II)
A226	62	Track 14 Plenary Session I	62	07-23-01: 100th Anniversary of the Timoshenko-Ehrenfest Beam Model	175	07-08-01: Multibody Dynamic Systems and Applications	177	07-20-01: Congress-Wide Symposium on NDE & SHM: Dynamics, Vibration, and Control for Structural Health Monitoring Applications
C160A				13-04-02: Applied Mechanics and Materials in Micro- and Nano-Systems	275	13-06-02: Microfluidics 2022		



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IMECE 2022 Committee Meetings & Special Events Listing

***Please see the conference app for the most up to date information*



IMECE 2022 COMMITTEE MEETINGS & SPECIAL EVENTS LISTING

Date of your meeting		Start time	End time		Venue
Saturday, October 29, 2022	Technical Committee on Publications & Communications	8:00 AM	12:00 PM		Hilton Hotel
Saturday, October 29, 2022	Joint Board of Editors (BOE) / Technical Committee on Publications & Communications	12:00 PM	4:30 PM		Hilton Hotel
Saturday, October 29, 2022	ASME TEC Sector Council Meeting Closed session 9:30 AM - 3:30 PM Open session 3:30pm- 5:00pm	8:00 AM	5:00 PM		Hilton Hotel
Sunday, October 30, 2022	Board of Governors Meeting Open Session 9:00 AM to 11:00 AM Closed Session 11:00 AM to 12:00 PM	8:30 AM	3:00 PM		Hilton Hotel
Sunday, October 30, 2022	ASME Division & Research Committee Chairs Meeting	9:00 AM	5:00 PM		Hilton Hotel
Sunday, October 30, 2022	BOE, Editor-in-Chiefs Workshop	10:00 AM	12:00PM		Hilton Hotel
Sunday, October 30, 2022	Foundation Awards Luncheon Invite Only	12:00 PM	1:30 PM		Hilton Hotel
Sunday, October 30, 2022	HTD Executive Committee Meeting (Closed Meeting)	1:00 PM	3:00 PM		Hilton Hotel
Sunday, October 30, 2022	IMECE First Time Attendee Orientation	3:30 PM	4:30PM		Columbus Convention Center
Sunday, October 30, 2022	HTD EC & K-Committee Leadership (Open) Meeting	3:30 PM	5:30 PM		Hilton Hotel
Sunday, October 30, 2022	Business Meeting	4:00 PM	4:30 PM		Hilton Hotel
Monday, October 31, 2022	Robert Henry Thurston Lecture	10:00 AM	11:00 AM		Hilton Hotel
Monday, October 31, 2022	Materials Division Nanomaterials for Biology and Medicine Technical Committee Meeting	3:00 PM	4:00 PM		Hilton Hotel
Monday, October 31, 2022	Material Division Centennial Celebration Symposium – Materials Past, Present, and Future (MD-CCS)	4:00 PM	6:30 PM		Hilton Hotel
Monday, October 31, 2022	Applied Mechanics Division - Fracture and Failure Mechanics Technical Committee	4:00 PM	6:00 PM		Hilton Hotel
Monday, October 31, 2022	Biomedical and Biotechnology Engineering Track Organizers Meeting	6:00 PM	7:00 PM		Hilton Hotel
Monday, October 31, 2022	Materials Division Composites and Heterogeneous Materials Technical Committee Meeting	7:00 PM	8:30 PM		Hilton Hotel
Monday, October 31, 2022	Materials Division Nanomaterials for Energy Technical Committee Meeting	7:00 PM	8:00 PM		Hilton Hotel
Monday, October 31, 2022	K-23 Diversity, Equity, and Inclusion Committee Meeting	7:30 PM	9:00 PM		Hilton Hotel
Monday, October 31, 2022	Materials Division Multifunctional Materials Technical Committee Meeting	8:00 PM	9:00 PM		Hilton Hotel
Tuesday, November 01, 2022	Applied Mechanics Division Executive Committee Meeting	9:00 AM	1:00 PM		Hilton Hotel
Tuesday, November 01, 2022	Heat Transfer Division Awards Luncheon	12:00 PM	1:30 PM		Hilton Hotel
Tuesday, November 01, 2022	Noise Control and Acoustics Division (NCAD) Executive Committee Meeting	12:30 PM	1:45 PM		Hilton Hotel



IMECE 2022 COMMITTEE MEETINGS & SPECIAL EVENTS LISTING

Tuesday, November 01, 2022	Applied Mechanics Division Awards Committee Meeting	1:00 PM	5:00 PM		Columbus Convention Center
Tuesday, November 01, 2022	AMD/MD Joint Committee on Constitutive Equations Technical Committee Meeting	2:00 PM	3:00 PM		Hilton Hotel
Tuesday, November 01, 2022	Materials Division Awards Event and Reception	3:00 PM	6:30 PM		Hilton Hotel
Tuesday, November 01, 2022	Advanced Energy Systems Division Lecture & Reception	5:00 PM	7:00 PM		Hilton Hotel
Tuesday, November 01, 2022	Koiter Lecture	5:00 PM	6:00 PM		Columbus Convention Center
Tuesday, November 01, 2022	K-13 Committee on Heat Transfer in Multiphase Systems	5:00 PM	7:00 PM		Hilton Hotel
Tuesday, November 01, 2022	AMD Dynamics and Control of Systems and Structures Technical Committee Meeting	5:30 PM	6:30 PM		Hilton Hotel
Tuesday, November 01, 2022	Applied Mechanics Division Awards Dinner	6:00 PM	9:00 PM		Hilton Hotel
Tuesday, November 01, 2022	Nanoscale Thermal Transport Committee Meeting (Heat Transfer Division, K-9)	6:00 PM	7:30 PM		Hilton Hotel
Tuesday, November 01, 2022	Materials Division Design of Engineering Materials Technical Committee Meeting	6:00 PM	7:30 PM		Hilton Hotel
Tuesday, November 01, 2022	Noise Control and Acoustics Division: Per Bruel Gold Medal Award & NCAD Reception	6:00 PM	7:30 PM		Hilton Hotel
Tuesday, November 01, 2022	ME Department Heads Reception	6:00 PM	7:30 PM		Hilton Hotel
Tuesday, November 01, 2022	ASME Journal of Engineering and Science in Medical Diagnostics and Therapy Editorial Board	6:00 PM	7:00 PM		Hilton Hotel
Tuesday, November 01, 2022	K-8 Committee Meeting	6:00 PM	8:00 PM		Hilton Hotel
Tuesday, November 01, 2022	Fire and Combustion Committee Meeting (Heat Transfer Division, K-11)	6:00 PM	7:30 PM		Hilton Hotel
Tuesday, November 01, 2022	Materials Division Materials Processing Technical Committee Meeting	6:30 PM	7:30 PM		Hilton Hotel
Tuesday, November 01, 2022	Materials Division Electronic Materials Technical Committee Meeting	6:30 PM	7:30 PM		Hilton Hotel
Tuesday, November 01, 2022	Advanced Energy Systems Division – Systems Analysis Technical Committee Meeting	7:00 PM	8:00 PM		Hilton Hotel
Tuesday, November 01, 2022	Advanced Energy Systems Division – Electrochemical Energy Conversion and Storage Technical Committee Meeting	7:00 PM	8:00 PM		Hilton Hotel
Tuesday, November 01, 2022	Advanced Energy Systems Division – Renewable Energy & Energy Conversion Technical Committee Meeting	7:00 PM	8:00 PM		Hilton Hotel
Tuesday, November 01, 2022	Advanced Energy Systems Division Executive Committee Meeting	8:00 PM	9:00 PM		Hilton Hotel



IMECE 2022 COMMITTEE MEETINGS & SPECIAL EVENTS LISTING

Wednesday, November 02, 2022	Applied Mechanics Division Technical Committee Meeting on Computing in Applied Mechanics (CONCAM)	8:30 AM	9:30 AM		Hilton Hotel
Wednesday, November 02, 2022	2022 IMECE Feedback Session	10:00 AM	11:00 AM		Columbus Convention Center
Wednesday, November 02, 2022	Noise Control and Acoustics Division General Committee Meeting	11:30 AM	1:00 PM		Hilton Hotel
Wednesday, November 02, 2022	Fluids Engineering Division (FED) Towne Hall Meeting	1:00 PM	2:00 PM		Hilton Hotel
Wednesday, November 02, 2022	Materials Division General Meeting (Open)	2:00 PM	3:30 PM		Hilton Hotel
Wednesday, November 02, 2022	2023 IMECE Track Organizers and Co-Organizers Meeting	3:00 PM	4:00 PM		Columbus Convention Center
Wednesday, November 02, 2022	NDPD/MED Panel on In-Process Nondestructive Evaluation During Manufacturing (Sponsor: ASME TEC)	3:00 PM	6:00 PM		Hilton Hotel
Wednesday, November 02, 2022	Materials Division Executive Committee Meeting (Closed)	3:45 PM	5:45 PM		Hilton Hotel
Wednesday, November 02, 2022	Noise Control and Acoustics Division: Rayleigh Lecture	4:00 PM	5:45 PM		Columbus Convention Center
Wednesday, November 02, 2022	IMECE Steering Committee Wrap-Up Meeting	4:00 PM	5:00 PM		Columbus Convention Center
Wednesday, November 02, 2022	K-6: Heat Transfer in Energy System Technical Committee Meeting, Heat Transfer Division	5:00 PM	6:30 PM		Hilton Hotel
Wednesday, November 02, 2022	ASME Aerospace Division Structures and Materials Reception	5:45 PM	7:00 PM		Hilton Hotel
Wednesday, November 02, 2022	MEMS Division Executive Committee Meeting	6:00 PM	7:30 PM		Hilton Hotel
Wednesday, November 02, 2022	Fluids Engineering Division (FED) Awards Reception	6:00 PM	7:30 PM		Hilton Hotel
Wednesday, November 02, 2022	K-20 Committee Meeting	6:00 PM	8:00 PM		Hilton Hotel
Wednesday, November 02, 2022	NDPD EC Open Meeting	6:00 PM	8:00 PM		Hilton Hotel
Wednesday, November 02, 2022	Advanced Manufacturing Track (Track 2) Technical Committee Meeting	7:00 PM	9:00 PM		Hilton Hotel
Wednesday, November 02, 2022	ASME Aerospace Division Structures and Materials Technical Committee Meeting	7:00 PM	9:00 PM		Hilton Hotel
Wednesday, November 02, 2022	Safety Engineering and Risk Analysis Division (SERAD) Committee Meeting	8:00 PM	9:00 PM		Hilton Hotel
Thursday, November 03, 2022	K-12 Aerospace Heat Transfer Meeting	2:30 PM	3:30PM		Columbus Convention Center



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Virginia Tech	300
Wiley	302

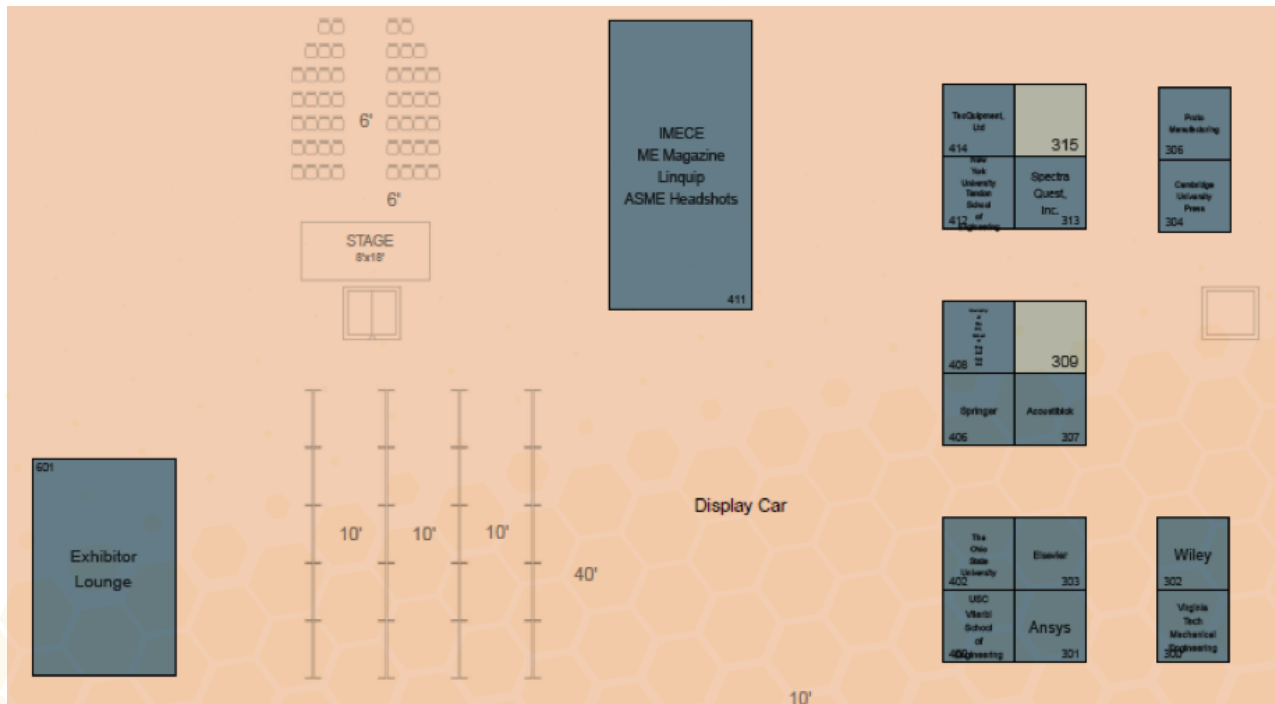


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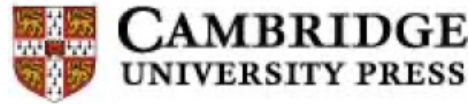
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<https://engineering.csuohio.edu/mce/mce>

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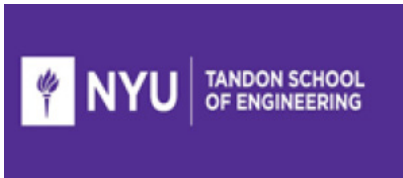


ELSEVIER

Elsevier (Booth #303)<https://www.elsevier.com/>

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**The Ohio State University (Booth 402)**<https://mae.osu.edu/>

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OHIO
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USC (Booth #400)

<https://viterbischool.usc.edu/>

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Virginia Tech (Booth #300)

<https://me.vt.edu/>

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