ASME SSDM 2024

ASME Aerospace Structures, Structural Dynamics, and Materials Conference

Program

CONFERENCE
April 29 - May 1, 2024

Hyatt Regency Lake Washington
Renton, WA

https://event.asme.org/SSDM

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SETTING THE STANDARD

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Dear Esteemed Attendees,

It gives us great pleasure to welcome you to the second edition of the Aerospace Structures, Structural Dynamics, and Materials (SSDM) Conference in Seattle, USA! We are thrilled to have you join us for this exciting three-day event.

The mission of SSDM is to convene and serve the global aerospace structures, structural dynamics, and materials communities by providing a unique venue for researchers, engineers, and practitioners from around the world to share their latest findings and insights on the latest advances in the fields of aerospace structures, structural dynamics, and materials. The conference program has been thoughtfully designed to provide you with the latest information and insights while also allowing ample opportunities for networking and collaboration. In addition to continuing the legacy left behind by the AIAA/ASME/ASC/AHS/ASCE SDM conference a decade ago, SSDM seeks to rally all the talents the world has to meet current and future challenges of aerospace structures, structural dynamics, and materials.

During the conference, you will have the opportunity to attend four plenary lectures, three track keynotes, and parallel technical sessions, covering a broad range of topics such as advanced manufacturing of aerospace structures and materials, applications of AI/ML in aerospace structures and materials, space structures, hypersonic vehicles, eVTOLs, and many others. The conference will also feature an award luncheon where we will recognize accomplished colleagues in our community and inspire the younger generations.

We are grateful for the visionary leadership from the ASME Aerospace Division, which gave birth to SSDM. We also want to sincerely thank the dedicated support from ASME staff, without whom it would be impossible to present this wonderful conference to you. Lastly, we deeply appreciate our advisory committee members, plenary speakers, track keynoters, topic organizers, authors, session chairs, and sponsors. Without their combined efforts, this SSDM conference would not be possible.

We are confident that you will find the ASME SSDM Conference to be a valuable and enriching experience. We encourage you to take advantage of the many opportunities for learning, networking, and collaboration that the conference has to offer. Afterward, we will invite your feedback to help us prepare for SSDM 2025.

Thank you for your participation and contributions to the success of this conference.

ASME SSDM Organizing Committee,

Wenbin Yu, Erkan Oterkus, Erasmo Carrera

Xin-Lin Gao, Ibrahim Guven, Konstantin Naumenko

Weihua Su, Zahra Sotoudeh, Marco Petrolo

Evan Pineda, Yongming Liu, Navid Zobeiry, Pavana Prabhakar

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University of Arizona

Mahantesh Hiremath, Ph.D., P.E., FASME
Vice President
SC Solutions

CONFERENCE INFORMATION

REGISTRATION

Lake Washington Ballroom Prefunction

Registration Hours:

Sunday, April 28:	2:00 pm – 5:00 pm
Monday, April 29:	7:00 am – 5:00 pm
Tuesday, April 30:	7:00 am – 5:00 pm
Wednesday, May 1:	7:00 am – 1:15 pm

BADGE REQUIRED FOR ADMISSION

All conference attendees must have an official ASME SSDM 2024 badge at all times in order to gain admission to technical sessions, plenaries, and other conference events. Without a badge, you will not be granted admission to conference activities.

SPONSOR EXHIBIT HOURS

Visit our sponsors during the conference in the Third Floor Meeting Space, across from Mercer Terrace, during registration hours.

PRESENTER ATTENDANCE POLICY

According to ASME's Presenter Attendance Policy, if a paper is not presented at the conference, the paper will not be published in the official Archival Proceedings, which are registered with the Library of Congress and are abstracted and indexed. The paper also will not be published in the ASME Digital Collection and may not be cited as a published paper.

SESSION ROOM EQUIPMENT

Each session room is equipped with a screen, LCD projector, and laptop. Speakers should arrive to their session room 10 minutes prior to the session start time. Bring a copy of your presentation on a USB/thumb-drive to be loaded onto the show computer.

ASME EVENTS APP

SSDM will utilize the mobile app "ASME Events" in place of a printed program to enhance the conference experience for attendees, speakers, exhibitors, and sponsors.
You will be able to:

- Connect with Attendees
- View Speaker Profiles
- Search and Access Session Information
- Download Final Papers
- Receive important announcements like schedule changes, important events, etc.

Keep an eye out for an email from no-reply@pheedloop.com more information on how to access and navigate the ASME Events App!

CONFERENCE MEALS

Breakfast will be served daily in the Lake Washington Ballroom from 7:00 am - 8:00 am.

The Awards Luncheon will be on Tuesday, April 30, from 11:45 am to 1:45 pm in the Lake Washington Ballroom to celebrate a select group for their contributions and achievements in aerospace engineering.

OPENING RECEPTION

Monday, April 29
6:00 pm – 7:00 pm
Mercer Terrace (weather permitting)

BEVERAGE BREAKS

Breaks will be provided in the Exhibit and Sponsor area. Come and meet our sponsors and join your fellow attendees for a few minutes of networking and discussion. The schedule is as follows:

Monday, April 29
3:15 pm – 3:45 pm

Tuesday, April 30
4:00 pm – 4:30 pm

Wednesday, May 1
12:45 pm – 1:15pm

CONFERENCE INFORMATION

PHOTOGRAPHS/VIDEO/AUDIO RECORDINGS

Unless otherwise agreed to in a separate document, participants are reminded that material presented at ASME conferences is under copyright of ASME. As a result, any recording of the presentations is prohibited.

LIMITATION OF LIABILITY

You agree to release and hold harmless ASME from all claims, demands, and causes of action arising out of or relating to your participation in this event.

CONFERENCE PROCEEDINGS

Each attendee will receive an email with a unique code to access digital copies of all the papers accepted for presentation at the conference. The official conference archival proceedings will be published after the conference and will not include accepted papers that were not presented at the conference. The official conference proceedings are registered with the Library of Congress and are submitted for abstracting and indexing. The proceedings are published in the ASME Digital Library. You will be provided with an individual link to the online papers via email. In the event you do not receive the email, send a request to conferencepubs@asme.org.

SSDM 2024 TRACK TOPICS & TOPICS ORGANIZERS

THANK YOU! Thank you to our Track & Topic Organizers! Without their dedication and time commitment, SSDM could not be a successful conference.

STRUCTURES	
General Topics of Aerospace Structures	Xin-Lin Gao, Ibrahim Guven
Adaptive and Multifunctional Structures	Xin-Lin Gao, Yeqing Wang
Advanced Manufacturing for Aerospace Structures	Yingtao Liu, Dong Lin, Christopher Billings
Advances in Aerospace Structures	Luciano Demasi, Wei Zhao
Applications of Artificial Intelligence/Machine Learning for Aerospace Structures	Yongming Liu, Xin Liu, Fei Tao
Impact, Fatigue, Damage and Fracture of Composite Structures	Mehmet Dorduncu, Masaaki Nishikawa, Weiyi Lu
Nonlinear Problems in Aerospace Structures	Erasmo Carrera, Alfonso Pagani
Nondestructive Evaluation and Structural Health Monitoring	Erkan Oterkus, Kaan Ozenc, Xiaowei Deng
Peridynamics and Its Applications	Erdogan Madenci, Selda Oterkus, Ibrahim Guven, Konstantin Naumenko, Christian Willberg
Structures in Extreme Environments	Ibrahim Guven and Zafer Kazanci

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STRUCTURAL DYNAMICS	
General Topics of Structural Dynamics of Aerospace Structures	Weihua Su
Aero-, Servo-, Thermo-Elastic Optimization of Aerial Vehicles	Daning Huang
Aero-, Servo-, Thermo-Elasticity of Fixed-Wing Vehicles of All Scales	Daning Huang, Matteo Filippi
Aeroelasticity, Aeromechanics, and Acoustics of Rotorcraft, Vertical Lift Aircraft, and Evtol	Marco Petrolo and Jinwei Shen
Structural Dynamics of Launch Vehicle and Spacecraft	Yi Wang
Structural Dynamics and Aeroelasticity of Morphing Wing and Structures	Wei Zhao
Nonlinear Dynamics, Flexible Multibody Dynamics	Matteo Filippi and Jinwei Shen
Dynamic Loads, Response, Vibration and Alleviation of Aerospace Structures and Vehicles	Marco Petrolo
Computer Methods and Reduced Order Modeling	Yi Wang
Experimental Studies in Structural Dynamics	Weihua Su
Machine Learning in Structural Dynamics and Aeroelasticity	Zahra Sotoudeh and Marco Petrolo
Model Uncertainties and Uncertainty Quantification in Structures and Structural Dynamics	Weihua Su

MATERIALS	
General Topics of Aerospace Materials	Navid Zobeiry, Yongming Liu
Advanced Manufacturing	Dwayne Arola, Xiangyang Dong
Damage, Fatigue, and Fracture	Trisha Sain and Raihan, Md Rassel
Emerging Materials Technology	Aniruddh Vashisth, Shanmugam Kumar
Integrated Computational Materials Engineering	Marco Salviato, Enrico Zappino
Materials Development Using AI	Alexandru Stere, Dragos Margineantu, Vishnu Saseedran
Materials for Extreme Environments	Xin Ning,Yeqing Wang
Micromechanics and Multiscale Modeling	Marianna Maiaru, Gregory Odegard, Haoyan Wei
Nanomaterials	Samit Roy, Jingyao Dai
Multifunctional Materials	Aniruddh Vashisth, Shanmugam Kumar, Ajit Roy
Testing and Characterization	Mahesh Chengalva, Rassel Raihan
Thermoplastic Composites	Evan Pineda, Navid Zobeiry
Surface and interface	Yao Qiao
Composites Design for Automated Fiber Placement and Additive Manufacturing	Satchi Venkataraman, Mehran Tehrani, Paul Davidson

SSDM 2024 SCHEDULE AT A GLANCE

Schedule Subject to Change

Pacific Time	Sunday - April 28, 2024
2:00 pm - 5:00 pm	Registration

Pacific Time	Monday - April 29, 2024
7:00 am - 5:00 pm	Registration
7:00 am - 8:00 am	Breakfast *(provided)*
8:00 am - 9:00 am	Plenary Talk - Earl Dowell, Duke University; *Adventures in Reduced Order Modeling*
9:00 am - 9:15 am	Break
9:15 am - 11:45 am	Technical Sessions / Materials Track Keynote
11:45 am - 1:15 pm	Lunch Break *(on own)*
1:15 pm - 3:15 pm	Technical Sessions
3:15 pm - 3:45 pm	Break
3:45 pm - 5:45 pm	Technical Sessions
6:00 pm - 7:00 pm	Evening Reception
7:00 pm - 9:00 pm	Structures Track Meeting (Welcome all current and potential topic organizers)

Pacific Time	Tuesday - April 30, 2024
7:00 am - 5:00 pm	Registration
7:00 am - 8:00 am	Breakfast *(provided)*
8:00 am - 9:00 am	Plenary Talk - Linda Cadwell Stancin, Lockheed Martin Aeronautics *Next Generation Structures, Materials, & Analysis Methods for Aerospace & Defense Applications*
9:00 am - 9:15 am	Break
9:15 am - 11:45 am	Technical Sessions / Structures Track Keynote
11:45 am - 1:45 pm	Awards Luncheon & Plenary Talk - Dr. William A. Sirignano, University of California, Irvine *Liquid Atomization: Vorticity Dynamics and Real-fluid Thermodynamics*
1:45 pm - 2:00 pm	Break
2:00 pm - 4:00 pm	Technical Sessions
4:00 pm - 4:30 pm	Break
4:30 pm - 6:00 pm	Technical Sessions
6:00 pm - 8:00 pm	Structural Dyanmics Track Meeting (Welcome all current and potential topic organizers)
6:00 pm - 8:00 pm	Materials Track Meeting (Welcome all current and potential topic organizers)

Pacific Time	Wednesday - May 1, 2024
7:00 am - 1:15 pm	Registration
7:00 am - 8:00 am	Breakfast *(provided)*
8:00 am - 9:00 am	Plenary Talk - Steve Chisholm, The Boeing Company; *Smart Manufacturing: Impact on Productivity, Sustainability and Workforce*
9:00 am - 9:15 am	Break
9:15 am - 11:45 am	Technical Sessions / Structural Dynamics Track Keynote
11:45 am - 1:15 pm	Lunch Break *(on own)*
1:15 pm - 3:45 pm	Technical Sessions

SSDM 2024 PLENARY SESSIONS

PLENARY SESSION

Monday, April 29, 2024
8:00 am – 9:00 am
Presentation Title: Adventures in Reduced Order Modeling

Earl Dowell
William Holland Hall Distinguished Professor
Pratt School of Engineering
Duke University

Abstract: Reduced order models (ROM) have captured the interest and effort of many investigators over the years. As is well known the cost of computation can easily outpace the available computational resources, especially for multidisciplinary mathematical/computational models. The presentation is a personal account of one investigator›s journey, enabled by substantial contributions from colleagues in several organizations over the years. It is intended to be an account of key ideas as seen from a single perspective. By a reduced order model is meant a model that provides a substantial reduction in the size nd cost of the original computational model without any essential loss in accuracy. And the motivation for creating such a ROM is not only to reduce the computational cost. By extracting the essential elements of a more elaborate model a much wider range of parameters in the model may be studied and the interpretation of the results may be made easier, thereby advancing out understanding of the model and they physical phenomena it is interned to describe.

Biography: Dr. 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 US 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 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.

PLENARY SESSION

Tuesday, April 30, 2024
8:00 am – 9:00 am
Presentation Title: Next Generation Structures, Materials, and Analysis Methods for Aerospace and Defense Applications

Linda Cadwell Stancin
VP Air Vehicle Engineering and Technology
Lockheed Martin Aeronautics

Abstract: The Aerospace and Defense landscape has changed dramatically with: 21st Century security challenges and strategic responses, digital transformation and artificial intelligence capabilities, breakthrough space missions, unmanned air vehicles, biomaterials and climate/sustainability needs. This disruptive landscape both necessitates and facilities next generation opportunities in design, analysis, and materials technologies. Innovation must be achieved rapidly and affordably, while protecting product quality. This presentation will describe the new needs, present recent Aerospace and Defense examples of next generation solutions and serve as a call for further innovations.

Biography: Linda Cadwell Stancin is currently serving as Vice President, Air Vehicle Engineering at Lockheed Martin Aeronautics Company. The Directorates in AVE include Military Operations Analysis, Conceptual Design, Flight Sciences, Vehicle Systems, Model Base Systems Engineering, Structures Engineering, Material, Specialty, and Process Engineering, Simulations, Test and Evaluation and Flight Test. AVE leadership provides functional strategies, engineering expertise and staffing to support all Aeronautics programs and technologies. Approximately 5000 AVE engineers, scientists and technicians serve Lockheed Martin and our customers. Linda is also the Engineering executive sponsor for the development and implementation of Model Base and Digital Engineering.

She previously served as Vice President of Research and Technology in Lockheed Martin's Chief Technology Organization. This role included: Global Research and Innovation, Research Programs, Technology Integration and Intellectual Property Management, Tech Collaboration, and Emerging Operations Technologies. She also served as the Chair of Lockheed Martin's Technology Council, executive sponsor of the LM Fellows Program, Co-Chair of the EO Intellectual Property Board, and represented Engineering and Technology on the EO Diversity and Inclusion Council and the corporate Sustainability Leadership Group.

She joined Lockheed in March 2018 from Spirit AeroSystems to stand up Emerging Technologies for Digital Transformation. At Spirit AeroSystems, Linda was the executive leader of Research and Manufacturing Technology for the corporation. She led teams across multiple sites, including a research site in Scotland. Her teams provided research and engineering enabling significant OEM and other business wins. She was also the technical executive responsible for Intellectual Property strategy and the sponsor of the Technical Fellowship. Prior to this role she was the Director of Corporate Structures Engineering and Technology, including laboratories, structures analysis and certification, material and process engineering, and executive skill team leadership for Engineering.

Before joining Spirit, Linda worked at the Boeing Company for 16 years. Her last role was as senior manager for Composites, Interiors and Finishes Technologies for Boeing Commercial Airplanes. She also led the multidisciplinary skill area for the enterprise. Prior to this role she led corporate research and technology support to BCA Product Development.

Linda is currently on the Board for the Manufacturing Institute MxD. She advises and was an affiliate professor at the University of Washington in Seattle. She received her Ph.D. in Engineering from the University of Illinois Urbana-Champaign with research in materials science. She has multiple publications and patents.

THE SPIRIT OF ST. LOUIS MEDAL AWARD & PLENARY SESSION

Tuesday, April 30, 2024
Awards Lunch Presentation; 11:45 am – 1:45 pm
Presentation Title: Liquid Atomization: Vorticity Dynamics and Real-fluid Thermodynamics

Dr. William A. Sirignano
Distinguished Professor of Mechanical and Aerospace Engineering
University of California, Irvine

Abstract: The presentation is an overview of multi-dimensional, unsteady solutions of the Navier-Stokes equations (NS) for liquid jets moving through a gas with the description of liquid deformation through a cascade involving sequential formation of smaller and smaller liquid structures. We analyze round and slot jets for the temporal mode and the spatially developing round jet. Interface tracking and curvature determination occur simultaneously with the NS solutions while the vorticity field is determined by post processing using λ2 and λρ methodologies. Vorticity dynamics explains the physical behaviors for both ideal fluids and real fluids.

A wide range is considered for the density ratio of the two fluids. In the study of incompressible gas and liquid without phase change, three different physical behaviors can occur depending on the values of Reynolds number (Re) based on liquid properties and the Weber number (We) based on gas properties. For real fluids at higher pressures, coupling of NS with the energy and species-continuity equations is essential; change of phase, molecular mixing in both phases, liquid compressibility, and heat transfer become important. The behavior is very different from the ideal-fluid behavior in the lower-pressure case because of reduced surface tension, liquid compressibility, and phase change. The wrong belief of many that two phases are not present and a diffusion process is dominant is clearly contradicted.

Biography: Dr. Sirignano was a Professor at Princeton University from 1967 to 1979 after receiving his Ph.D. from there in 1964. He was the George Tallman Ladd Professor and Department Head at Carnegie-Mellon University from 1979 to 1984 before becoming the Engineering Dean at UCI. He left the deanship and currently he is a Distinguished Professor of Mechanical and Aerospace Engineering at UCI.

PLENARY SESSION

Wednesday, May 1, 2024
8:00 am – 9:00 am
Presentation Title: Smart Manufacturing: Impact on Productivity, Sustainability and Workforce

Steve Chisholm
Vice President and Chief Engineer
Boeing Mechanical and Structural Engineering

Abstract: In virtually everything we do in engineering we generate a great amount of data. Sometimes we are data rich and insight poor. Sometimes we can leverage a data-centric approach to unlock a new way to approach engineering and manufacturing. This presentation will focus on three aspects that intersect in the smart manufacturing area, and leverage additive manufacturing in aerospace as a primary example. These intersecting aspects are: digital engineering impact on productivity, digital engineering and additive manufacturing impacts on the workforce, and impact of additive manufacturing on sustainability.

Biography: Steve Chisholm is the Vice President and Chief Engineer for Boeing Mechanical and Structural Engineering, a team of more than 9,000. In this capacity, he is responsible for independent technical oversight for product safety, quality and integrity, and he leads the establishment of the technical roadmap for the function. Steve ensures the development of the functional team, the application and curation of design practices, and he drives the replication of best practices for Mechanical and Structural Engineering across the Boeing enterprise.

Previously, Steve was the Boeing Commercial Airplanes (BCA) Vice President and Senior Chief of Structures Engineering. In this capacity, he set the Structures technical direction and technology readiness for Structures, ensuring overall structural integrity of Boeing's products and services across all the commercial offerings, and for our future products.

Chisholm is a strong supporter of airplane safety. He was an Authorized Representative, has long been involved in safety and compliance issues, and he was a member of the Boeing Technical Fellowship before entering management. Chisholm has been an active member of several airplane accident investigations and continues to provide leadership to the structures team that supports investigations.

In addition to his responsibilities at Boeing, Steve is the executive sponsor for the company relationship with the University of Washington and a member of the university's visiting committee for the college of engineering. He also serves on the Industry Advisory Board for the American Society of Mechanical Engineers (ASME) and as part of ASME's Committee on Engineering Education. Steve is passionate about the next generation of engineers and allyship for those who are underrepresented in engineering. Chisholm joined Boeing in 1986 as a structural stress analyst on the 747 and 767 programs. He holds a Bachelor of Science in mechanical engineering from the University of Washington and a Masters in business administration from Seattle University.

SSDM 2024 TRACK KEYNOTES

MATERIALS KEYNOTE

Monday, April 29, 2024
9:15 am – 10:15 am
Keynote Title: Effects of Material & Process Control on Composite Aging

Dr. Larry Ilcewicz
Chief Scientific and Technical Advisor
Advanced Composites

Abstract: This seminar summarizes existing practices for composite aircraft certification, with an emphasis on structural aging aspects, and discusses the limitations and lessons learned from today›s «traditional» composite structures. It describes procedures that can be used to certify innovative designs that use advanced materials and processes which may have increased levels of variability, unfamiliar structural performance, nonclassical (e.g., nonlocal) behavior, and unique properties. Provided such complexity can be reliably controlled by design, while maintaining repeatable materials and processes in fabricating and assembling parts, both design and production certification can be achieved. When successful, related technical advances from real applications will meet safety, form, fit and functional requirements, while achieving product value to manufacturers, suppliers, partners and customers. Practical experiences derived from applications using team members with numerous engineering, business, and other skills, provides crucial base knowledge for the future workforce needs of industry. The discussion will cover many engineering aspects, including mechanical, chemical, industrial, and manufacturing, as well as risk management within the safety continuum for numerous aircraft product types.

Biography: Dr. Larry Ilcewicz is the FAA Chief Scientific and Technical Advisor for Composite Materials. He started work with the FAA in 1998 and has supported many certification activities for small airplanes, rotorcraft and transport aircraft. He has also worked on accident investigations and service problems involving composites. These experiences helped Larry develop an international plan for composite safety and certification initiatives to work with industry, academia, and other government groups in pursuit of guidance, training and standardization. These efforts formed the basis for a FAA Aviation Safety Composite Plan, which outlines work until 2027.

Larry came to the FAA from Boeing, where he worked 17 years on various programs in the commercial transport aircraft division, including support to 737, 757, 767 and 777 aircraft in various stages of development, production, and service. Larry was also principal investigator for NASA-funded research to develop composite design and manufacturing concepts for a wide-body transport fuselage in the 1990s. Boeing helped sponsor his PhD in Mechanical Engineering at Oregon State University. Larry has authored/co-authored more than 90 technical publications, including several FAA policy and guidance documents. He has been co-chairman for Composite Materials Handbook 17, CMH-17, since joining the FAA. In 2013, he received the Presidential Rank Award and, in 2018, he received the American Institute of Aeronautics and Astronautics Crichlow Trust Prize.

STRUCTURES KEYNOTE

Tuesday, April 30, 2024
9:15 am – 10:15 am
Keynote Title: Application of Composites
and Additive Manufacturing to Armament Systems

Dr. Andrew Littlefield
US Army
DEVCOM AC Benet Labs

Abstract: The emphasis on lightweight large caliber weapons systems has placed the focus on the use of advanced composite materials. In the past composites have been applied to direct fire cannons and electromagnetic railguns. Those efforts focused on thermoplastics and high-tension winding. Unfortunately, traditional thermoplastics cannot handle the temperatures needed for howitzer and mortar applications.

For howitzers there are traditional thermosets that can handle the use temperatures, but they cure at high temperatures, and this results in a gap forming between the tube and the gun tube. Service temperatures for a mortar tube exceed the temperature capability of most high temperature thermoset materials during rapid fire, with high bore pressures and propellant flame temperatures exacerbating the problem. The mortar baseplate couples the load directly to the ground from any firing angle and any soil resulting in a very complex loading situation. Several efforts are currently underway to deal with these applications.

Armaments, especially large caliber armaments, tend to be complicated, highly loaded, and low production rate items. The complicated geometries and low rates of production lends itself to additive manufacturing (AM). One extremely attractive benefit of AM is the ability to print at the point of need. This ability can greatly simplify the logistics train and will help units stay in the fight even when cut off from resupply. However, until recently the high material property requirements and physical size have made converting these parts to AM impractical.

One current AM effort is a 155mm muzzle brake. This brake is currently cast with long lead times and a significant portion require rework. The part is roughly 33 inches long, 15 inches tall and 20 inches wide. Attempts have been made to manufacture this brake via Electron Beam Additive Manufacturing and Wire Arc Additive Manufacturing. Additionally, an effort is underway to optimize the design and print it using laser powder bed fusion.

Another effort is focused on evaluating bound metal printing as possible means of fabricating at the point of need. A program is underway to compare bound metal solutions from MarkForged, BASF, Rapida and others. The program will consist of printing coupons and conducting material property testing to compare these different materials / systems. Parts will then be fabricated, and field tested.

This presentation will go over these and other efforts currently underway at the DEVCOM Armaments Center along with their goals, progress, and future plans.

Biography: Dr. Littlefield is the lead composite engineer at CCDC AC Benét Laboratories, Watervliet, NY, where he works on composite gun tubes and shrouds, electromagnetic railgun launchers, gun barrel vibration absorbers, and simulated proof testing of mortar base plates. Prior to joining CCDC AC, he worked for the U.S. Air Force Research Laboratory on applying composites to spacecraft structures. He received the 2010 Army Science Conference Best Paper Lethality Award and several research and development awards. He has authored several journal and conference papers and technical reports. He has patents for a self-powering prognostic gun tag, an electromagnetic gun launcher, and composite mortar base plate and tube. Dr. Littlefield holds a Ph.D. in mechanical engineering from Rensselaer Polytechnic Institute (RPI).

STRUCTURAL DYNAMICS KEYNOTE

Wednesday, May 1, 2024
9:15 am – 10:15 am
Keynote Title:
Adaptive Aeroelastic Wing – Enabling Sustainable Aviation

Dr. Nhan Nguyen
Technical Group Lead
Advanced Control
and Evolvable Systems Group
Intelligent Systems Division
NASA Ames Research Center

Abstract: Adaptive wing is viewed as a key enabling technology in modern aircraft design to achieve sustainable aviation. In this talk, research on NASA performance adaptive aeroelastic wing technologies will be presented. Shape-changing concepts and active aero-structural control technologies will provide integrated strategies to enable future adaptive wing aircraft design. Experimental validation efforts are conducted by NASA jointly with industry and academia to mature adaptive wing technologies.

Biography: Dr. Nhan Nguyen is a senior technical group leader of the Advanced Control and Engineering Systems (ACES) research group at NASA Ames Research Center. He is managing a 22-person research group conducting research & development in advanced flight control and structural control of aerospace vehicles. He previously held leadership positions with NASA Aeronautics Research Mission Directorate as project scientist and deputy project manager of the Integrated Resilient Aircraft Control project in charge of developing research implementation at four NASA aeronautics centers. Dr. Nguyen has published more than 290 technical publications and one textbook. His research impact covers the convergence of control theories, flight vehicle dynamics, and structural dynamics. He developed advanced adaptive flight control flown onboard F-18 aircraft and mission-adaptive wing shaping control for high-aspect ratio wing aircraft. He was awarded NASA's prestigious Exceptional Scientific Achievement Medal for significant scientific contributions in the advancement of these new capabilities. He is also the recipient of more than 60 other NASA honors and awards. He is the holder of 8 U.S. patents. Dr. Nguyen is an adjunct professor at University of California Santa Cruz. He is an associate fellow of the American Institute of Aeronautics and Astronautics and a former chair of the Intelligent Systems Technical Committee.

SSDM 2024 AWARDS

Several prestigious internationally recognized awards are given at the Annual SSDM Conference during the Awards Lunch on Tuesday, April 30. These awards are very well recognized amongst the Aerospace SDM community.

THE SPIRIT OF ST. LOUIS MEDAL

The Spirit of St. Louis Medal is awarded for meritorious service in the advancement of aeronautics and astronautics. The medal was established in 1929 by Philip D. Ball, ASME Members, and Citizens of St. Louis, Missouri.

Recipient: Dr. William A. Sirignano
Distinguished Professor of Mechanical and Aerospace Engineering
University of California, Irvine

ASME/BOEING STRUCTURES AND MATERIALS AWARD

The ASME Aerospace Division Structures and Materials Technical Committee reviewed the papers published at the 2023 ASME Aerospace Structures, Structural Dynamics, Materials Conference. On the basis of originality and significance to the field, the paper titled “Machine Learning-Aided Cohesive Zone Modeling of Fatigue Delamination” (SSDM2023-107351) has been identified as the winner of the Boeing Structures and Materials Award.

Congratulations to the Authors:

Liang Zhang, AnalySwift
Xin Liu, The University of Texas at Arlington
Su Tian, AnalySwift
Zhenyuan Gao, Dassault Systèmes
Wenbin Yu, Purdue University

JOHN J. MONTGOMERY AWARD FOR DISTINGUISHED INNOVATION IN AEROSPACE

The Montgomery Innovation Award will recognize the outstanding contribution of an individual engineer residing in the international community who has researched, designed or developed (or any combination thereof) new technologies or equipment for the aerospace industry, i.e., propulsion, aerospace structure/materials, stability and control, etc.

Recipient: Ajit K. Roy
Principal Materials Research Engineer
US Air Force Research Lab

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2024 AEROSPACE ITALY

AIDAA ASSOCIAZIONE ITALIANA DI AERONAUTICA E ASTRONAUTICA
30th AIAA/CEAS AEROACOUSTICS CONFERENCE
75th INTERNATIONAL ASTRONAUTICAL CONGRESS
34th CONGRESS OF THE INTERNATIONAL COUNCIL OF THE AERONAUTICAL SCIENCES

Program current as of March 21, 2024 Please refer to the ASME Events app for the most current schedule.

Individual Technical Presentations are listed in presentation order and are allotted 30 minutes.
Track Keynotes are allotted 60 minutes.

TECHNICAL SESSIONS

MONDAY, 4/29/2024

01-01-01
General Topics of Aerospace Structures
4/29/2024 9:15 AM to 11:45 AM - Rainier

Chair: **Xin-Lin Gao - Southern Methodist University**
Chair: **Ibrahim Guven - Virginia Commonwealth University**

Presentations:

Announcing HyperXpert™ Design Insights for Generating Lightweight Manufacturable Designs, {SSDM2024-139119}
Technical Presentation Only
August Noevere - Collier Aerospace
Craig Collier - Collier Aerospace

Rapid Design and Analysis of a Payload Mass Simulator Using Digital Twin Modeling Instructions, {SSDM2024-132959}
Technical Presentation Only
Vinay Goyal - The Aerospace Corporation
Jacob Rome - The Aerospace Corporation
Mason Hickman - The Aerospace Corporation

Beam Cross-Sectional Analysis for Shape Optimization, {SSDM2024-137554}
Technical Presentation Only
Joshua Krokowski - University of California San Diego
Darshan Sarojini - University of California San Diego
Sebastiaan Van Schie - University of California San Diego
John Hwang - University of California San Diego

Novel Approach for Simplifying Carbon/epoxy Composites Design Based on Invariants and Non-Conventional Laminates, {SSDM2024-137209}
Technical Presentation Only
Carlos Cimini - UFMG - Federal University of Minas Gerais

Enhancing Energy Absorption Capacity of Pyramidal Lattice Structures via Geometrical Tailoring and 3D Printing, {SSDM2024-121512}
Technical Paper Publication
Mohammed Ayaz Uddin - Khalifa university
Imad Barsoum - Khalifa University
Shanmugam Kumar - University of Glasgow
Andreas Schiffer - Khalifa University

01-05-01
Applications of Artificial Intelligence/Machine Learning for Aerospace Structures
4/29/2024 9:15 AM to 11:45 AM - Bellevue I

Chair: **Xin Liu - University of Texas at Arlington**
Chair: **Yongming Liu - Arizona State University**
Chair: **Fei Tao - Dassault Systemes Simulia Corp**

Presentations:

OC-DICAM: One Class Defect Identification in Composite Aerostructure Material, {SSDM2024-121466}
Technical Paper Publication
Austin Yunker - Argonne National Laboratory
Rajkumar Kettimuthu - Argonne National Laboratory
Zachary Kral - Spirit Aerosystems Inc

A Novel Machine Learning Framework for Digital Estimation of Allowables in Aerospace Composites, {SSDM2024-121597}
Technical Paper Publication

Amirali Eskandariyun - University of Washington
Huilong Fu - University of Washington
Alexandru Stere - Boeing
Andrew Bauer - Boeing
Carla Reynolds - Boeing
Mahesh Chengalva - Boeing
Shannon Dong - Boeing
John Dong - Boeing
Steven Brunton - University of Washington
Navid Zobeiry - University of Washington

Lattice Structure Design Using Machine Learning and Homogenization Approach, {SSDM2024-121612}
Technical Paper Publication
Mohammed Abir Mahdi - Oklahoma State University
Christopher Crick - Oklahoma State University
Wei Zhao - Oklahoma State University

Geometric Intelligence and Design Informatics for Advanced Materials, Structures, and Manufacturing, {SSDM2024-135792}
Technical Presentation Only
Jida Huang - University of Illinois

Reduced Order Modeling for Structural Optimization, {SSDM2024-142728}
Technical Presentation Only
Rakesh Kapania - Virginia Tech

02-02-01
Aero-, Servo-, Thermo-Elastic Modeling and Optimization of Aerial Vehicles
4/29/2024 9:15 AM to 11:45 AM - Renton

Chair: **Weihua Su - The University of Alabama**
Chair: **Sicheng He - University of Tennessee**

Presentations:

On the Impact of Including Gust and Flutter Constraints on the Design of Flying Wing Aircraft, {SSDM2024-121652}
Technical Paper Publication
Joshua Deslich - Airforce Research Laboratory
Kevin Mchugh - Air Force Research Laboratory

Modal Design Optimization for Panel Flutter and Thermal Buckling, {SSDM2024-121670}
Technical Paper Publication
Kevin McHugh - Air Force Research Laboratory
Catherine Leszcz - University of Colorado Boulder

Applications of Optimal Sensor Placement, Inverse Methods, and Classification for Decision-Making in Aerospace Structural Dynamics, {SSDM2024-137604}
Technical Presentation Only
Timothy Walsh - Sandia National Laboratories
Wilkins Aquino - Duke University
Jacob Desmond - Sandia National Laboratories
Cameron Mccormick - Sandia National Laboratories
Clay Sanders - Sandia National Laboratories
Chandler Smith - Sandia National Laboratories

Adjoint-Based Hopf-Bifurcation Instability Sensitivity and Suppression, {SSDM2024-138268}
Technical Presentation Only
Sicheng He - University of Tennessee, Knoxville
Daning Huang - The Pennsylvania State University

Introduction to Aeroelasticity With a Doublet-Lattice-Method-Based Approach: A New Perspective, {SSDM2024-137516}
Technical Presentation Only
Luciano Demasi - San Diego State University

03-15-01
Composites Design for Automated Fiber Placement and Additive Manufacturing

4/29/2024 **9:15 AM to 11:45 AM - Seattle**

Chair: **Paul Davidson -**
Chair: **Mehran Tehrani - University of California San Diego**

Presentations:

Effects of Material & Process Control on Composite Aging
Materials Track Keynote
Dr. Larry Ilcewicz - FAA Chief Scientific and Technical Advisor for Composite Materials

Design for Additive Manufacturing (Dfam) of Continuous Fiber Reinforced Composites, {SSDM2024-134719}
Technical Presentation Only
Timothy Yap - The University of Texas At Austin
Ali Tamijani - Embry-Riddle Aeronautical University
Mehran Tehrani - University of California San Diego

Review of Advanced Constitutive Models for Additive Manufactured Self-Healing Composites in Aerospace Applications, {SSDM2024-137866}
Technical Presentation Only
Ivica Smojver - University of Zagreb, Faculty of Mechanical Engineering and Naval Architecture
Darko Ivančević - University of Zagreb, Faculty of Mechanical Engineering and Naval Architecture

Influence of Post-Processing and Intra-Build Design Parameters on the Fracture Toughness Variation of Electron Beam Melted Ti6al4v, {SSDM2024-137935}
Technical Presentation Only
Melody Mojib - University of Washington
Ramulu Mamidala - University of Washington
Dwayne Arola - University of Washington

01-01-02
General Topics of Aerospace Structures

4/29/2024 **9:15 AM to 11:45 AM - Bellevue II**

Chair: **Xin-Lin Gao - Southern Methodist University**
Chair: **Ibrahim Guven - Virginia Commonwealth University**
Chair: **Zhangxian Yuan - Worcester Polytechnic Institute**

Presentations:

Predictive Assembly of Composite Aerospace Components Using Finite Element Analysis, {SSDM2024-137305}
Technical Presentation Only
Lucas Meza - University of Washington
Nathan Shah - Boeing
Per Reinhall - University of Washington
Allison Clark - Boeing

Co-Rotational Weak-Form Quadrature Beam Element for Nonlinear Static and Dynamic Analysis of Non-Prismatic Beams Made of Functional Graded Materials, {SSDM2024-137214}
Technical Presentation Only
Thi Mai Linh Phi - Worcester Polytechnic Institute
Zhangxian Yuan - Worcester Polytechnic Institute

Analyze Composite Structure With Stiffened Structure Concept App, {SSDM2024-137293}
Technical Presentation Only
Fei Tao - Dassault Systemes America Corp

Stochastic Thermal Buckling Analysis of Variable Angle Tow Composites, {SSDM2024-121632}
Technical Paper Publication
Mishal Thapa - The University of Alabama
Wei Zhao - Mechanical & Aerospace Engineering, Oklahoma State University
Sameer Mulani - The University of Alabama

In-Space Assembly of Large Mesh Reflector Antennas, {SSDM2024-121359}
Technical Presentation Only
Jongeun Suh - California Institute of Technology
Sahangi Dassanayake - California Institute of Technology
Mark Thomson - TENDEG, LLC
Sergio Pellegrino - California Institute of Technology

03-08-02
Micromechanics and Multiscale Modeling
4/29/2024 **10:15 AM to 11:45 AM - Baker**

Chair: **Haoyan Wei - Ansys Inc.**
Chair: **Gregory Odegard - Michigan Tech University**

Presentations:

Microstructure-Sensitive Study of Effective Mechanical and Thermal Properties of Fiberform Materials, {SSDM2024-137561}
Technical Presentation Only
Donglai Liu - University of Kentucky
Khaleda Maya - University of Kentucky
Hailong Chen - University of Kentucky

A Multiscale Approach to the Design and Analysis of Weav3d Lattice Structures, {SSDM2024-137656}
Technical Presentation Only
Jeff Wollschlager - Altair Engineering
Chris Oberste - WEAV3D
Marco Salviato - University of Washington

A Macro Solver Agnostic Software Framework for Massively Multiscale Modeling Using Nasa Multiscale Analysis Tool and Precice, {SSDM2024-137666}
Technical Presentation Only
Ishaan Desai - University of Stuttgart
Ibrahim Kaleel - Oak Ridge Associated Universities, Oak Ridge, TN, U.S.A / NASA Glenn Research Center
Evan Pineda - NASA Glenn Research Center
Trenton Ricks - NASA Glenn Research Center
Peter Gustafson - NASA Glenn Research Center / Western Michigan University
Brett Bednarcyk - NASA Glenn Research Center
Steven Arnold - NASA Glenn Research Center
Anthony Waas - University of Michigan
Benjamin Uekermann - University of Stuttgart

03-02-03
Advanced Manufacturing
4/29/2024 **10:15 AM to 11:45 AM - West Seattle**

Chair: **Xiangyang Dong -**
Chair: **Dwayne Arola - University of Washington**

Presentations:

Contribution of Defects in Laser Powder Bed Fusion of Ti6al4v to the Variability in Mechanical Properties Within and Across Machines, {SSDM2024-121678}
Technical Presentation Only
Rick Schleusener - University of Washington
Reid Schur - University of Washington
Alex Montelione - University of Washington
Mamidala Ramulu - University of Washington
Dwayne Arola - University of Washington

A Hyper-Viscoelastic Model for the Bending and Compaction Responses of Pre-Impregnated Tapes Under Processing Conditions, {SSDM2024-137861}
Technical Presentation Only
Qingxuan Wei - Purdue University
Yao Sun - Purdue University
Dianyun Zhang - Purdue University

An Icme Approach for Sf-Cmcs via Diw at Elevated Temperatures, {SSDM2024-138525}
Technical Presentation Only
Jason Sun - University at Buffalo, State University of New York
Mason Guo - University at Buffalo, State University of New York
Joseph Marziale - University at Buffalo, State University of New York
David Salac - University at Buffalo, State University of New York
James Chen - University at Buffalo, State University of New York

01-04-01
Advances in Aerospace Structures
4/29/2024 **1:15 PM to 3:15 PM - Rainier**

Chair: **Wei Zhao - Oklahoma State University**
Chair: **Luciano Demasi - San Diego State University**
Chair: **Zubaer Hossain - Texas A&M University**

Presentations:

Flexural Strength and Shear Properties of Sandwich Composites Made of 3D-Printed Cores, {SSDM2024-121190}
Technical Paper Publication
Gazi Abu Raihan - University of New Orleans
Uttam Chakravarty - University of New Orleans

Designing Effective Modulus of 3d-Printable Curvilinear Fiber-Reinforced Composites, {SSDM2024-138371}
Technical Presentation Only
Zubaer Hossain - Texas A&M University

A General and Efficient High-Fidelity Design Tool for Advanced Tailorable Composites, {SSDM2024-133733}
Technical Presentation Only
Su Tian - AnalySwift
Xin Liu - University of Texas at Arlington
Wenbin Yu - Purdue University

Reduced Order Modeling and Image Processing for Structural Analysis of Tow Steered Composite Laminates Considering Gaps/overlaps, {SSDM2024-121250}
Technical Paper Publication
Soumik Dutta - Oklahoma State University
Mohammed Abir Mahdi - Oklahoma State University
Wei Zhao - Oklahoma State University

02-04-01
Experimental Studies in Structural Dynamics
4/29/2024 **1:15 PM to 3:15 PM - Renton**

Chair: **Weihua Su - The University of Alabama**
Chair: **Wei Zhao - Oklahoma State University**

Presentations:

Zero Stiffness in Bellow-Type Soft Pneumatic Actuators for Modal Analysis of Flexible Aircraft Wings, {SSDM2024-121625}
Technical Paper Publication
Moritz Sprengholz - Technische Universität Braunschweig
Patrick Meyer - Technische Universität Braunschweig
Hendrik Traub - Technische Universität Braunschweig
Christian Hühne - Technische Universität Braunschweig

Experimental and Numerical Analyses of a Ball on an Oscillating Beam Apparatus, {SSDM2024-121472}
Technical Paper Publication
Justin Arbaiza - California State University Northridge
Jennifer Jimenez - California State University Northridge
David Boyajian - California State University Northridge

Experimental Investigation of Shock-Induced Aeroelastic Instabilities, {SSDM2024-133511}
Technical Presentation Only
Kirk Brouwer - AFRL
Ricardo Perez - AFRL
Zachary Riley - AFRL
Timothy Beberniss - AFRL
Michael Spottswood - AFRL

Experimental and Numerical Simulation of the Aerothermoelastic Behavior of Thin Panels at Mach 6, {SSDM2024-133498}
Technical Presentation Only
Zachary Riley - AFRL
Ricardo Perez - AFRL
David Ehrhardt - University of Illinois Urbana-Champaign
Kirk Brouwer - AFRL

03-04-01
Emerging Materials Technology
4/29/2024 **1:15 PM to 3:15 PM - Seattle**

Chair: **Aniruddh Vashisth - University of Washington**
Chair: **Shanmugam Kumar - University of Glasgow**

Presentations:

Radio Frequency Heating of Healable Polymeric Composites, {SSDM2024-120816}
Technical Presentation Only
Aniruddh Vashisth - University of Washington

Rapid Welding of Fiber Reinforced Vitrimer Composites Using Ultrasonic Welding, {SSDM2024-121148}
Technical Presentation Only
Ankush Nandi - University of Washington, Seattle
Agni Biswal - University of Washington
Aniruddh Vashisth - University of Washington, Seattle

Large-Scale Simulations of the Spring Tires and Actuation Devices Made of Shape Memory Alloys, {SSDM2024-121467}
Technical Presentation Only
Paria Naghipour - NASA Glenn Research Center
Santo Padula - NASA Glenn Research Center
Othmane Benafan - NASA Glenn Research Center
Colin Creager - NASA Glenn Research Center
Peter Caltagirone - NASA Glenn Research Center

On Measuring the Elastic Constants of Chiral Cellular Metamaterials, {SSDM2024-137793}
Technical Presentation Only
Liang Zhang - AnalySwift LLC
Wenbin Yu - Purdue University
Haodong Du - Purdue University

03-05-01
Integrated Computational Materials Engineering
4/29/2024 **1:15 PM to 3:15 PM - West Seattle**

Chair: **Enrico Zappino - Politecnico di Torino**
Chair: **Marco Salviato - University of Washington**

Presentations:

Practical Applications of the Material Modeling Approach in the Aerospace Industry, {SSDM2024-121060}
Technical Paper Publication
Mahesh Chengalva - Boeing
Vivian Dang - The Boeing Company

Rapid Numerical Assessment of Process-Induced Dimensional Changes and Residual Stresses in Large Aerospace Composite Parts, {SSDM2024-121518}
Technical Paper Publication
Enrico Zappino - Politecnico di Torino
Navid Zobeiry - University of Washington
Rebecca Masia - Politecnico di Torino
Marco Petrolo - Politecnico di Torino

Layer-Wise Modeling of Temperature Distributions and Degree of Cure to Evaluate Process-Induced Deformation and Residual Stress, {SSDM2024-121553}
Technical Paper Publication
Enrico Zappino - Politecnico di Torino
Marco Petrolo - Politecnico di Torino
Martina Santori - Politecnico di Torino

Multiscale Process Modeling of a Carbon Fiber/epoxy Composite for Predicting Residual Stress, {SSDM2024-120832}
Technical Presentation Only
Gregory Odegard - Michigan Tech Univ
Marianna Maiaru - University of Massachusetts Lowell

03-06
Materials Development Using Artificial Intelligence
4/29/2024 **1:15 PM to 3:15 PM - Baker**

Chair: **Alexandru Stere - Abstract World Technology**
Chair: **Dragos Margineantu - Boeing Company**

Presentations:

Accurate Prediction of Process-Induced Deformations in Composites Using Multi-Fidelity Simulation and Theory-Guided Probabilistic Machine Learning, {SSDM2024-121050}
Technical Paper Publication
- Caleb Schoenholz - University of Washington
- Enrico Zappino - Politecnico di Torino
- Marco Petrolo - Politecnico di Torino
- Navid Zobeiry - University of Washington

Designing High Temperature Vitrimers for Aerospace Applications Using Machine Leaning and Molecular Dynamics, {SSDM2024-121400}
Technical Presentation Only
- Yiwen Zheng - University of Washington
- Aniruddh Vashisth - University of Washington

Application of Machine Learning to the Design of Carbon Nanotube Bundle Microstructures via Genetic Algorithms and Convolutional Neural Networks, {SSDM2024-137577}
Technical Presentation Only
- Karen Demille - University of Utah
- Riley Hall - Virginia Commonwealth University
- Ibrahim Guven - Virginia Commonwealth University
- Ashley Spear - University of Utah

Accelerated Materials Innovation Using High-Throughput Strategies and Machine Learning Toolsets, {SSDM2024-137786}
Technical Presentation Only
- Surya Kalidindi - Georgia Institute of Technology

01-02-02
Adaptive and Multifunctional Structures
4/29/2024 **1:15 PM to 3:15 PM - Bellevue II**

Chair: **Xin-Lin Gao - Southern Methodist University**
Chair: **Gongye Zhang - Southeast University**

Presentations:

Differential Pressure Analysis of 3d Printed Gator Morphing Skins: Novel Experimental Approach, {SSDM2024-121418}
Technical Paper Publication
- Rafael Heeb - University of Bristol
- Benjamin King Sutton Woods - University of Bristol

Tunable Energy Harvesting in Defective Phononic Crystals Based on the Elastic Foundation Effect, {SSDM2024-137000}
Technical Presentation Only
- Gongye Zhang - Southeast University
- Shaopeng Wang - Southeast University
- Jun Hong - Southeast University

Electrical Characterization and Electromagnetic Interference Shielding Properties of Hybrid Buckypaper Reinforced Polymer Matrix Composites, {SSDM2024-121586}
Technical Paper Publication
- Kartik Tripathi - Arizona State University
- Madeline Morales - DEVCOM Army Research Laboratory
- Mohamed Hamza - Arizona State University
- Todd Henry - DEVCOM Army Research Laboratory
- Asha Hall - DEVCOM Army Research Laboratory
- Aditi Chattopadhyay - Arizona State University

Additively Manufactured Fiber-Assisted Porous Structures With Enhanced Multifunctional Properties, {SSDM2024-137924}
Technical Presentation Only
- William Johnston - Michigan Technological University
- Janith Godakawela - Michigan Technological University
- Bhisham Sharma - Wichita State University
- Carlos Gatti - Wichita State University
- Suresh Keshavanarayana - Wichita State University

01-05-02
Applications of Artificial Intelligence/Machine Learning for Aerospace Structures
4/29/2024 **1:15 PM to 3:15 PM - Bellevue I**

Chair: **Xin Liu - University of Texas at Arlington**
Chair: **Yongming Liu - Arizona State University**
Chair: **Fei Tao - Dassault Systemes Simulia Corp**

Presentations:

Unsupervised and Supervised Machine Learning Algorithms for Low Velocity Impact Damage Quantification in Cfrp Composites, {SSDM2024-137043}
Technical Presentation Only
Olesya Zhupanska - University of Arizona
A Brelay - University of Arizona
M Chen - University of Arizona

Designing Robust Cross-Barrier Communication Using Adaptive Support Vector Machines, {SSDM2024-137441}
Technical Presentation Only
Cameron Mccormick - Sandia National Laboratories
Charles Reinke - Sandia National Laboratories
Wilkins Aquino - Duke University
Jacob Desmond - Sandia National Laboratories
Timothy Walsh - Sandia National Laboratories

Scalable Finite Element Analysis Neural Network (Fea-Net) Model for Structures and Materials Analysis, {SSDM2024-138338}
Technical Presentation Only
Xiaoyun Fan - Arizona State University
Changyu Meng - Arizona State University
Yongming Liu - Arizona State University

Structural Analysis of Tow-Steered Composite Structures Using Physics-Guided Neural Networks, {SSDM2024-138536}
Technical Presentation Only
Xin Liu - University of Texas at Arlington
Bangde Liu - The University of Texas at Arlington

01-07
Nonlinear Problems in Aerospace Structures
4/29/2024 **3:45 PM to 5:45 PM - Bellevue I**

Chair: **Erasmo Carrera - Politecnico di Torino**
Chair: **Alfonso Pagani - Politecnico Di Torino**

Presentations:

Optimization of Variable Stiffness Composites Considering Gaps/Overlaps and Unified Structural Theories, {SSDM2024-121550}
Technical Paper Publication
Alfonso Pagani - Politecnico Di Torino
Alberto R. Sanchez-Majano - Politecnico di Torino
Dario Zamani - Politecnico di Torino

Fenicsx-Based Geometrically Nonlinear Analysis of Reissner—mindlin Shells for Composite Structures, {SSDM2024-136286}
Technical Presentation Only
Ru Xiang - University of California San Diego
Austin Herrema - Envision Energy
Fang Jiang - Envision Energy
John Hwang - University of California San Diego
Justin Mullings - Envision Energy

On the Implementation of Viscoplastic Models in an Open Source Finite Element Code (Calculix), {SSDM2024-125708}
Technical Presentation Only
Michele Ferraiuolo - CIRA
Roberto Citarella - University of Salerno

Manufacturing of Ultra-Thin Thermoplastic Composites for Deployable Space Structures, {SSDM2024-137503}
Technical Presentation Only
Federico Benazzo - California Institute of Technology
Sergio Pellegrino - California Institute of Technology

02-05-01
Machine Learning in Structural Dynamics and Aeroelasticity
4/29/2024 **3:45 PM to 5:45 PM - Renton**

Chair: **Weihua Su - The University of Alabama**
Chair: **Marco Petrolo - Politecnico di Torino**

Presentations:

Selection of Beam, Plate, and Shell Theories Using an Axiomatic/Asymptotic Method and Neural Networks, {SSDM2024-121308}
Technical Paper Publication
- Marco Petrolo - Politecnico di Torino
- Pierluigi Iannotti - Politecnico di Torino
- Alfonso Pagani - Politecnico di Torino
- Erasmo Carrera - Politecnico di Torino

Aeroservoelasticity's Digital Simulation Using PLC, {SSDM2024-121552}
Technical Paper Publication
- K. Sudha Deepthi - Dayananda Sagar University
- Rammohan B - Dayananda Sagar University

Cpp Digital Twin for Aerospace Engineering (Cpp-Ditta) Progress Demonstration, {SSDM2024-137560}
Technical Presentation Only
- Michael Quach - California State Polytechnic University, Pomona
- Johnny Garcia - California State Polytechnic University, Pomona
- Markus Eger - California State Polytechnic University, Pomona
- Zahra Sotoudeh - California State Polytechnic University, Pomona

Evaluating the Performance of Sparse Identification of Nonlinear Dynamical in the Presence of Noise in Training Data for Gust Response Analysis, {SSDM2024-137570}
Technical Presentation Only
- Zahra Sotoudeh - California State Polytechnic University, Pomona
- Ziyin Yuan - California State Polytechnic University, Pomona

03-11-01
Thermoplastic Composites
4/29/2024 **3:45 PM to 5:45 PM - Seattle**

Chair: **Navid Zobeiry - University of Washington**
Chair: **Evan Pineda - NASA Glenn Research Center**

Presentations:

An Implicit Integration Scheme for Nonlinear Viscoelastic–viscoplastic Polymers, {SSDM2024-121606}
Technical Presentation Only
- Liang Zhang - AnalySwift LLC
- Wenbin Yu - Purdue University

Characterization of Thermoplastic In-Situ Consolidation & Post-Processing: Interlayer, Intralayer, and Fiber-Matrix Adhesion, {SSDM2024-136402}
Technical Presentation Only
- Joseph Kirchhoff - The University of Texas at Austin (Walker, Oden)
- Timothy Yap - Walker Department of Mechanical Engineering The University of Texas at Austin
- Pratik Koirala - Walker Department of Mechanical Engineering The University of Texas at Austin
- Nathan Heathman - Walker Department of Mechanical Engineering The University of Texas at Austin
- Tyler Hudson - NASA Langley Research Center
- Mehran Tehrani - Structural and Materials Engineering, University of California San Diego

Stamp Forming of Highly Aligned Discontinuous Fiber Thermoplastic Matrix Composite Laminates, {SSDM2024-137556}
Technical Presentation Only
- Thomas Cender - University of Delaware
- Shridhar Yarlagadda - University of Delaware

Mechanical Recycling Process of Aerospace-Grade Lm-Paek Thermoplastic Composites, {SSDM2024-138365}
Technical Presentation Only
- Minsu Park - Ulsan National Institute of Science and Technology
- Wooseok Ji - Ulsan National Institute of Science and Technology

01-04-02
Advances in Aerospace Structures
4/29/2024 3:45 PM to 5:45 PM - Rainier

Chair: **Wei Zhao - Oklahoma State University**
Chair: **Luciano Demasi - San Diego State University**

Presentations:

Multiscale Constitutive Modeling of Microstructures With Shell Geometry, {SSDM2024-121629}
Technical Presentation Only
Akshat Bagla - Purdue University
Ernesto Camarena - Sandia National Laboratories
Wenbin Yu - Purdue University

Coupled Field Formulation – a Unified Method for Formulating Structural Mechanics Problems, {SSDM2024-122605}
Technical Presentation Only
Dr. Ramprasad Srinivasan - Jain (Deemed to be University)

Agile and Resilient Parametric Stiffened Structure Concepts Leveraging Seamless Modeling and Simulation (Modsim) in 3dexperience Platform, {SSDM2024-137443}
Technical Presentation Only
Pierre-Yves Mechin - Dassault Systèmes
Nicolas Guerin - Dassault Systèmes
Julie Barré - Dassault Systèmes
Emir Touajni - Dassault Systèmes
Florent Savine - Dassault Systèmes

Designing and Optimizing Stiffened-Structure Concepts Using the 3dexperience Platform, {SSDM2024-137539}
Technical Presentation Only
Florent SAVINE - Dassault Systèmes
Pierre Yves Méchin - Dassault Systèmes
Emir Touajni - Dassault Systèmes
Nicolas Guerin - Dassault Systèmes
Julie Barre - Dassault Systèmes

03-05-02
Integrated Computational Materials Engineering
4/29/2024 3:45 PM to 5:45 PM - West Seattle

Chair: **Marco Salviato - University of Washington**
Chair: **Enrico Zappino - Politecnico di Torino**

Presentations:

Indentation Over a Poroelastic and Layered Composite Plate, {SSDM2024-121245}
Technical Presentation Only
Ernian Pan - National Yang Ming Chiao Tung University
Zhiqing Zhang - Wenzhou University of Technology

Integration of Nanoscale and Microscale Analysis for Process Modeling of Toray 3900 Epoxy Resin Using Icme, {SSDM2024-121572}
Technical Presentation Only
Sagar Patil - Michigan Technological University
Sagar Shah - University of Massachusetts Lowell
Mariana Maiaru - University of Massachusetts Lowell
Gregory Odegard - Michigan Technological University

Optimal System Size for Molecular Dynamics Simulation of Epoxy Materials, {SSDM2024-121934}
Technical Presentation Only
Khatereh Kashmari - Michigan technological university
Sagar Patil - Michigan technological university
Gregory. M Odegard - Michigan Technological University

Integrated Process Simulation for Advanced Composites Manufacturing, {SSDM2024-137934}
Technical Presentation Only
Ryan Enos - Purdue University
Dianyun Zhang - Purdue University

03-12-02
Testing and Characterization
4/29/2024 3:45 PM to 5:45 PM - Baker

Chair: **Rassel Raihan - University of Texas at Arlington**
Chair: **Mahesh Chengalva - Boeing**

Presentations:

Analysis of Stress Concentration Effects in Column Bending Test Fixtures Through Virtual Testing, {SSDM2024-136493}
Technical Presentation Only
Miguel Mireles - University of Texas at El Paso
Armanj Hasanyan - University of Texas at El Paso

Unveiling Full-Field Modulus and Stress Using Digital Image Correlation, {SSDM2024-136911}
Technical Presentation Only
Joseph Kirchhoff - The University of Texas at Austin (Walker, Oden)
Dingcheng Luo - The University of Texas at Austin
Thomas O'leary Roseberry - The University of Texas at Austin
Zixiang Tong - The University of Texas at Austin
Jin Yang - Department of Aerospace Engineering & Engineering Mechanics, The University of Texas at Austin
Omar Ghattas - The University of Texas at Austin

Material Testing 2.0: Leveraging Full-Field Measurements for Next-Generation Mechanical Testing, {SSDM2024-137928}
Technical Presentation Only
Isabella Mendoza - MatchID US
Amar Peshave - MatchID
Pascal Lava - MatchID
Fabrice Pierron - MatchID

Investigating the Synergistic Enhancement of Mechanical and Surface Properties of Composite Materials With Carbon Dust-Infused Polyacrylonitrile-Based Electrospun Nanomats., {SSDM2024-138518}
Technical Presentation Only
Sharmin Akter - University of Texas at Arlington
Monjur Morshed Rabby - University of Texas at Arlington
Minhazur Rahman - University of Texas at Arlington
Partha Pratim Das - University of Texas at Arlington
Vamsee Vadlamudi - UT Arlington Research Institute
Rassel Raihan - University of Texas at Arlington

01-02-03
Adaptive and Multifunctional Structures
4/29/2024 **3:45 PM to 5:45 PM - Bellevue II**

Chair: **Xin-Lin Gao - Southern Methodist University**
Chair: **David Valliyappan - Universiti Teknologi MARA**

Presentations:

High-Acceleration Mechanical Shock Characteristics of an Industrial Marine Fender, {SSDM2024-121164}
Technical Paper Publication
David N. V. - School of Engineering, College of Engineering, Universiti Teknologi MARA
Noor Dhahiyyah Shafia M. R. - Universiti Teknologi MARA

Adaptive-Stiffness Characteristics of Pneumatic Rotary Actuators for Folding Wingtips, {SSDM2024-121566}
Technical Paper Publication
Patrick Meyer - Technische Universität Braunschweig
Moritz Sprengholz - Technische Universität Braunschweig
Hendrik Traub - Technische Universität Braunschweig
Christian Hühne - Technische Universität Braunschweig

Design of an Internal Rollable Spar for an Instability Based Deployable Propeller Blade, {SSDM2024-138544}
Technical Presentation Only
Annan Mashin - University of Central Florida
Kawai Kwok - Purdue University

Experimental Evaluation of a Low-Speed Aeronautical Ducted Propeller, {SSDM2024-137940}
Technical Presentation Only
Juan Pablo Velasco Cataño - IMPETUS INDOMITUS - Universidad del Valle
Guillermo Andrés Jaramillo Pizarro - IMPETUS INDOMITUS - Universidad del Valle

TUESDAY, 4/30/2024

01-02-01
Adaptive and Multifunctional Structures
4/30/2024 **9:15 AM to 11:45 AM - Bellevue I**

Chair: **Xin-Lin Gao - Southern Methodist University**
Chair: **Yeqing Wang - Syracuse University**

Presentations:

Application of Composites and Additive Manufacturing to Armament Systems
Structures Track Keynote
Dr. Andrew Littlefield- US Army DEVCOM AC Benet Labs

A New Thermodynamics Framework for All-Solid-State Batteries, {SSDM2024-121680}
Technical Presentation Only
Xin-Lin Gao - Southern Methodist University
Mohamed Shaat - Southern Methodist University

On Maintaining Bistability of Prestressed Laminates After Clamping, {SSDM2024-137679}
Technical Presentation Only
Karthik Boddapati - Purdue University
Juan C. Osorio - Purdue University
Andres F. Arrieta - Purdue University

Auxetic Carbon Fiber Composite Laminates: A Tradeoff Between Impact Resistance and Tensile Properties, {SSDM2024-137320}
Technical Presentation Only
Yeqing Wang - Syracuse University
Wenhua Lin - Syracuse University

01-03-01
Advanced Manufacturing for Aerospace Structures
4/30/2024 **10:15 AM to 11:45 AM - Rainier**

Chair: **Yingtao Liu - University of Oklahoma**
Chair: **Christopher Billings - University of Oklahoma**
Chair: **Dong Lin - Oregon State University**

Presentations:

Machine Learning and Artificial Intelligence-Enhanced Image Processing and Feature Extraction for Microstructure and Metallurgical Characterization, {SSDM2024-121490}
Technical Paper Publication
Benjamin Sherwood - University of Oklahoma
Christopher Billings - University of Oklahoma
Joshua Hall - University of Oklahoma
Caylin Nimmo - University of Oklahoma
Zahed Siddique - University of Oklahoma
Yingtao Liu - University of Oklahoma

An Architecture for Orbital Manufacturing in Support of the Future Space Enterprise, {SSDM2024-121280}
Technical Presentation Only
Jacob Rome - The Aerospace Corporation
Vinay Goyal - The Aerospace Corporation

Wraptor Truss Joints: Path Planning for Three Dimensionally Wound Joint Structures With Manufacturing Constraints, {SSDM2024-121665}
Technical Paper Publication
Mengzhou Zhao - University of Bristol
Terence Macquart - University of Bristol
Benjamin K. S. Woods - University of Bristol

01-09-01
Peridynamics and Its Applications
4/30/2024 **10:15 AM to 11:45 AM - Bellevue II**

Chair: **Ibrahim Guven - Virginia Commonwealth University**
Chair: **Selda Oterkus - University of Strathclyde**

Presentations:

A New Peridynamic Equilibrium Equation From the Energy Functional, {SSDM2024-138396}
Technical Presentation Only
Erdogan Madenci - University of Arizona
Yanan Zhang - The University of Arizona
Sundaram Vinod K. Anicode - The University of Arizona

A Peridynamic Computational Homogenisation Model to Investigate the Effect of Phase Contrast and Inclusion Shape of Viscoelastic Composite Materials, {SSDM2024-131192}
Technical Presentation Only
Yakubu Kasimu Galadima - University of Strathclyde
Erkan Oterkus - University of Strathclyde
Selda Oterkus - University of Strathclyde

Modeling of Viscoelastic Materials by Using an Improved Ordinary State-Based Peridynamic Theory With Variable Horizon, {SSDM2024-137923}
Technical Presentation Only
Mehmet Dorduncu - Erciyes University

02-03-01
Computer Methods and Reduced Order Modeling, and Model Uncertainties
4/30/2024 9:15 AM to 11:45 AM - Renton

Chair: **Weihua Su - The University of Alabama**
Chair: **Yi Wang - University of South Carolina**

Presentations:

A Parametric Dynamic Mode Decomposition for Reduced-Order Modeling of Highly Flexible Aircraft, {SSDM2024-121594}
Technical Paper Publication
TIANYI HE - Utah State University
Weihua Su - The University of Alabama

Towards Optimal Reduced Complexity Modeling of Fluid Structure Interactions Under Impinging Shocks, {SSDM2024-137769}
Technical Presentation Only
Rohit Deshmukh - Florida Atlantic University
Vilas Shinde - Mississippi State University

Linear Parameter-Varying Models for Coupled Nonlinear Aeroelasticity and Flight Dynamics of Highly Flexible Aircraft, {SSDM2024-137851}
Technical Presentation Only
Weihua Su - The University of Alabama

Importance Sampling Combined With Separable Monte Carlo for Efficient Reliability Analysis of Linear Dynamic Structures, {SSDM2024-120912}
Technical Paper Publication
Mahdi Norouzi - Grand Valley State University
Badal Thapa - University of Toledo

Critical Buckling Load Distribution of Thin-Walled Cylindrical Shells: A Closer Look at the Lower Tail, {SSDM2024-121650}
Technical Presentation Only
Wen Luo - Auburn University

03-07-01
Materials for Extreme Environment
4/30/2024 9:15 AM to 11:45 AM - West Seattle

Chair: **Xin Ning - University of Illinois Urbana-Champaign**
Chair: **Yeqing Wang - Syracuse University**

Presentations:

Foreign Object Damage in Ytterbium Disilicate Based Environmental Barrier Coatings Modified for Oxidation Resistance, {SSDM2024-121869}
Technical Paper Publication
Leland Hoffman - HX5
Michael Presby - NASA Glenn Research Center
Bryan Harder - NASA Glenn Research Center
Jamesa Stokes - NASA Glenn Research Center

Cold Spray Deposition of Ni-Peek Composite Micro-Powders to Form Erosion Coating on Helicopter Rotor Blades, {SSDM2024-121569}
Technical Presentation Only
Tyler John Littmann - The Applied Research Laboratory at Penn State
Chloé Zarader - Penn State
Miles Taylor - Penn State
Caillin James Ryan - The Applied Research Laboratory at Penn State
Christopher Michael Desalle - The Applied Research Laboratory at Penn State
Namiko Yamamoto - Pennsylvania State University
Douglas Edward Wolfe - The Applied Research Laboratory at Penn State

Evolving Structures-Properties Correlations of a Polymerized Phenolic Resin During Pyrolysis, {SSDM2024-122021}
Technical Presentation Only
Ivan Gallegos - Michigan Technological University
Josh Kemppainen - Michigan Technological University
Gregory Odegard - Michigan Technological University
Vikas Varshney - Air Force Research Laboratory

Ablative Analysis of Composite Material Based on Peridynamics, {SSDM2024-122321}

Technical Presentation Only
Yile Hu - Shanghai Jiao Tong University
Yin Yu - Shanghai Jiao Tong University

Reactive Molecular Dynamics Simulations of the Furan Pyrolysis Process in Carbon-Carbon Composite Fabrication, {SSDM2024-132106}
Technical Presentation Only
Josh Kemppainen - Michigan Technological University
Ivan Gallegos - Michigan Technological University
Jacob Gissinger - Stevens Institute of Technology
Kristopher Wise - NASA Langley Research Center
Margaret Kowalik - Pennsylvania State University
Gregory Odegard - Michigan Technological University

03-12-01
Testing and Characterization
4/30/2024 **9:15 AM to 11:45 AM - Seattle**

Chair: **Mahesh Chengalva - Boeing**
Chair: **Rassel Raihan - University of Texas at Arlington**

Presentations:

Impact of Stacking Sequence and Size Effects on Open Hole Compressive Performance, {SSDM2024-120908}
Technical Paper Publication
Joseph McDonald - Toray Composite Materials America
Donyeong Lee - Toray Composite Materials America
Ichiro Taketa - Toray Composite Materials America

Nanoscale Property Characterization of Composite Adhesive Bonding Systems With Long-Term Environmental Exposures, {SSDM2024-121492}
Technical Paper Publication
Rita Olander - University of Washington
Ashley Tracey - The Boeing Company
William Grace - The Boeing Company
Brian Flinn - University of Washington

Structural and Aerodynamic Characteristics of Micro-Perforated Porous Sheets for Laminar Flow Control, {SSDM2024-121620}
Technical Paper Publication
Hendrik Traub - Technische Universität Braunschweig
Jan Kube - Technische Universität Braunschweig
Siby Jose - Technische Universität Braunschweig
Adarsh Prasannakumar - Technische Universität Braunschweig
Christian Hühne - Technische Universität Braunschweig

Correlation of Ultem 9085 Physical, Chemical, and Mechanical Properties, {SSDM2024-122420}
Technical Presentation Only
Seth O'Brien - Oregon State University
John Parmigiani - Oregon State University

A Crystal Plasticity Model to Study Stress Localization and Size-Dependent Tensile Properties of Additively Manufactured Nickle-Base Superalloy: Haynes 214™ at Elevated Temperature, {SSDM2024-132992}
Technical Presentation Only
Mohammad M. Keleshteri - The University of Arizona
Subhadip Sahoo - The University of Arizona
Jason Mayeur - Oak Ridge National Laboratory
Kavan Hazeli - The University of Arizona

03-03-02
Damage, Fatigue, and Fracture
4/30/2024 9:15 AM to 11:45 AM - Baker

Chair: **Rassel Raihan - University of Texas at Arlington**
Chair: **Marco Salviato - University of Washington**

Presentations:

A Combined Damage Index for Micro-Crack Growth Prediction, {SSDM2024-121675}
Technical Presentation Only
Haiying Huang - University of Texas Arlington
Arash Valiollahi - Univ. of Texas Arlington

Arxi-Tex Composites: Role of Weave Architecture on Fracture Toughness of Woven Composites, {SSDM2024-137357}
Technical Presentation Only
Hridyesh Raj Tewani - University of Wisconsin - Madison
Jackson Cyvas - University of Wisconsin - Madison
Kennedy Perez - University of Wisconsin - Madison
Pavana Prabhakar - University of Wisconsin - Madison

Compressive Failure Mechanisms and Their Transitions in Woven Composites Under on and Off-Axis Loading, {SSDM2024-137415}
Technical Presentation Only
Kedar Kirane - Stony Brook University
Leana Grotz - Stony Brook University

Crack Growth-Based Fatigue Life Prediction Under Random Multiaxial Loadings, {SSDM2024-137673}
Technical Presentation Only
Xiaoyun Fan - Arizona State University
Yongming Liu - Arizona State University

Nanocellular Polymeric Foams: Disrupting Conventional Fracture Toughness Scaling Laws, {SSDM2024-137686}
Technical Presentation Only
Kush Dwivedi - University of Washington
Santhosh Sridhar - University of Washington
Vipin Kumar - University of Washington
Lucas Meza - University of Washington
Marco Salviato - University of Washington

02-08-01
Dynamic Loads, Response, Vibration and Alleviation of Aerospace Structures and Vehicles
4/30/2024 2:00 PM to 4:00 PM - Renton

Chair: **Weihua Su - The University of Alabama**
Chair: **Daning Huang - The Pennsylvania State University**

Presentations:

Incline Firing Analysis Using ANSYS to Determine Directional Barrel Deformations, {SSDM2024-121581}
Technical Paper Publication
Ce Huang - Embry-Riddle Aeronautical University
Jean-Michel Dhainaut - Embry-Riddle Aeronautical University
Jefferson Talley - Embry Riddle Aeronautical University
Phil Du - McMaster University

Role of Flow Unsteadiness in High-Speed Aeroelastic Behavior of a Cantilever Plate, {SSDM2024-130677}
Technical Presentation Only
Jordan Thayer - The Ohio State University
Matthew Kronheimer - The Ohio State University
Rohit Deshmukh - Florida Atlantic University
Jack Mcnamara - The Ohio State University
Datta Gaitonde - The Ohio State University

Aeroelastic Coupling Mechanisms Between a Shock/boundary-Layer Interaction and a Flexible Panel, {SSDM2024-137575}
Technical Presentation Only
Matthew Kronheimer - The Ohio State University
Jordan Thayer - The Ohio State University
Jack Mcnamara - The Ohio State University
Datta Gaitonde - The Ohio State University

Stereo Digital Image Correlation and Infrared Measurements of a Thin Metallic Panel Dynamic Response in High-Speed Flow Ranging From Mach 3 to 5.3, {SSDM2024-138183}
Technical Presentation Only
Timothy Beberniss - AFRL

03-13-01
Surface and Interface
4/30/2024 **2:00 PM to 4:00 PM - Baker**

Chair: **Paulina Diaz-Montiel - University of San Diego**
Chair: **Yao Qiao - Pacific Northwest National Laboratory**

Presentations:

Equivalent Properties of Interfacial Void Defects at the CFRTP-Adhesive Interface and Their Detrimental Effects on the Bonding Performance of Metal-CFRTP Dissimilar Joints, {SSDM2024-120848}
Technical Paper Publication
- Yao Qiao - Pacific Northwest National Laboratory
- Yongsoon Shin - Pacific Northwest National Laboratory
- Seunghyun Ko - Pacific Northwest National Laboratory
- Avik Samanta - Pacific Northwest National Laboratory
- Robert Seffens - Pacific Northwest National Laboratory
- Jose Ramos - Pacific Northwest National Laboratory
- Daniel Merkel - Pacific Northwest National Laboratory
- Khaled Shahwan - Pacific Northwest National Laboratory
- Kevin Simmons - Pacific Northwest National Laboratory

Exploring Failure of Adhesively-Bonded Joints With Different Void Sizes at the Same Void Volume Fraction Through a Micro-Scale Numerical Modeling, {SSDM2024-121222}
Technical Paper Publication
- Yao Qiao - Pacific Northwest National Laboratory
- Seunghyun Ko - Pacific Northwest National Laboratory
- Yongsoon Shin - Pacific Northwest National Laboratory
- Kevin Simmons - Pacific Northwest National Laboratory

Enhancing Interfacial Bonding Strength in Short Carbon Fiber Composites Through Nanosecond Laser Surface Modification, {SSDM2024-121669}
Technical Presentation Only
- Seunghyun Ko - Pacific Northwest National Laboratory
- Avik Samanta - Pacific Northwest National Laboratory
- Yao Qiao - Pacific Northwest National Laboratory
- Daniel Merkel - Pacific Northwest National Laboratory
- Yongsoon Shin - Pacific Northwest National Laboratory
- Robert Seffens - Pacific Northwest National Laboratory
- Khaled Shahwan - Pacific Northwest National Laboratory
- Kevin Simmons - Pacific Northwest National Laboratory

Machine Learning Guided Nominal Shear Strength Prediction in Adhesive Metal Joints at the Micro Scale, {SSDM2024-137729}
Technical Presentation Only
- Mohammad Fuad Nur Taufique - Pacific Northwest National Laboratory
- Yao Qiao - Pacific Northwest National Laboratory
- Kevin Simmons - Pacific Northwest National Laboratory

01-09-02
Peridynamics and Its Applications
4/30/2024 2:00 PM to 4:00 PM - Bellevue II

Chair: **Erdogan Madenci - University of Arizona**
Chair: **Konstantin Naumenko - OVGU**
Chair: **Selda Oterkus - University of Strathclyde**

Presentations:

Multiphase Flow Wetting and Thermo-Capillary Flow Modelling by Using Peridynamic Differential Operator, {SSDM2024-131209}
Technical Presentation Only
- Bingquan Wang - University of Strathclyde
- Selda Oterkus - University of Strathclyde
- Erkan Oterkus - University of Strathclyde

Peridynamic Modeling of Damage in a Glass Plate Considering Random Surface Distribution of Critical Bond Stretch Due to Initial Flaws, {SSDM2024-133196}
Technical Presentation Only
- Olha Sukhanova - Otto-von-Guericke-Universität Magdeburg
- Konstantin Naumenko - Otto-von-Guericke-Universität Magdeburg
- Oleksiy Larin - National Technical University “Kharkiv Polytechnic Institute”

Peridynamic Modelling of High-Speed Waterdrop Impact Damage on Ceramic Materials, {SSDM2024-137493}
Technical Presentation Only
- Ugur Can - Virginia Commonwealth University
- Ibrahim Guven - Virginia Commonwealth University

Peridynamics Study on the Compressive Behavior of Additively Manufactured 3d Titanium Foams, {SSDM2024-137501}
Technical Presentation Only
- Riza Kaan Gonuleri - Virginia Commonwealth University
- Michael W. Czabaj - The University of Utah
- D. Joshua Cohen - Virginia Commonwealth University
- Barbara D. Boyan - Virginia Commonwealth University
- Zvi Schwartz - Virginia Commonwealth University
- Ibrahim Guven - Virginia Commonwealth University

03-07-02
Materials for Extreme Environment
4/30/2024 2:00 PM to 4:00 PM - West Seattle

Chair: **Yeqing Wang - Syracuse University**
Chair: **Xin Ning - University of Illinois Urbana-Champaign**

Presentations:

Hybrid Carbon/metal Composites for Lightning Strike Protection of Aircraft Structures, {SSDM2024-133089}
Technical Presentation Only
- Hridyesh Raj Tewani - University of Wisconsin - Madison
- Vincent Scheerer - University of Wisconsin - Madison
- Madison Owens - University of Wisconsin - Madison
- Emilio Cumbajin - University of Wisconsin - Madison
- Camila De Leon - University of Wisconsin - Madison
- Pavana Prabhakar - University of Wisconsin - Madison

Cfd Based Peridynamics Investigation of Structural Deformation and Damage Caused by High Speed Waterdrop Impact, {SSDM2024-137287}
Technical Presentation Only
- Ugur Can - Virginia Commonwealth University
- Manuel Viqueira-Moreira - University of Maryland
- Riza Kaan Gonuleri - Virginia Commonwealth University
- Monal Patel - University of Maryland
- Christoph Brehm - University of Maryland
- Ibrahim Guven - Virginia Commonwealth University

Optimizing Steam Jet Conditions for Environmental Barrier Coating (Ebc) Testing in High-Temperature, High-Velocity Environments, {SSDM2024-137445}
Technical Presentation Only
- Matthew Caulfield - University of Virginia
- Elizabeth Opila - University of Virginia

Lunar Regolith Composites With Carbon Nanotubes Under Lunar Environmental Temperature Cycling, {SSDM2024-137506}
Technical Presentation Only
- Andrea Hoe - Syracuse University
- Yeqing Wang - Syracuse University

03-11-02
NASA Thermoplastics Development for Exploration Applications (TDEA)
4/30/2024 **2:00 PM to 4:00 PM - Seattle**

Chair: **Evan Pineda - NASA Glenn Research Center**
Chair: **Sandi Miller - NASA Glenn Research Center**

Presentations:

Thermoplastic Composite Lunar Tower Truss Structure: Design Development and Verification Plans, {SSDM2024-137927}
Technical Presentation Only
- Ken Segal - NASA Goddard Space Flight Center
- Babak Farrokh - NASA Goddard Space Flight Center
- John Chiu - NASA Goddard Space Flight Center
- Andrew Bergan - NASA Langley Research Center
- Arunkumar Satyanarayana - NASA Langley Research Center
- Amanda Stark - NASA Langley Research Center
- Will Grier - NASA Langley Research Center
- Sandi Miller - NASA Glenn Research Center

Additive Manufacture Workflow for Continuous and Discontinuous Carbon Fiber Composites, {SSDM2024-137496}
Technical Presentation Only
- William Mulhearn - NASA Goddard Space Flight Center
- Scott Santoro - NASA Goddard Space Flight Center
- Phillip Steele - NASA Marshall Space Flight Center
- Stephen Lebair - NASA Goddard Space Flight Center
- Kenneth Segal - NASA Goddard Space Flight Center

Multiscale Modeling of Short Fiber Additively Manufactured Composites, {SSDM2024-137550}
Technical Presentation Only
- Brett Bednarcyk - NASA Glenn Research Center
- William Mulhearn - NASA Goddard Space Flight Center
- Ibrahim Kaleel - Oak Ridge Associated Universities
- Evan Pineda - NASA Glenn Research Center
- Phillip Steele - NASA Marshall Space Flight Center

01-02-04
Adaptive and Multifunctional Structures
4/30/2024 **2:00 PM to 4:00 PM - Bellevue I**

Chair: **Xin-Lin Gao - Southern Methodist University**
Chair: **Yeqing Wang - Syracuse University**

Presentations:

Ivabs: A Vabs-Based Design Framework for Composite Slender Structures, {SSDM2024-137742}
Technical Presentation Only
- Su Tian - AnalySwift
- Wenbin Yu - Purdue University

New Kirchhoff Rod Model Incorporating Surface Energy Effects, {SSDM2024-121113}
Technical Presentation Only
- Gongye Zhang - Southeast University
- Xin-Lin Gao - Southern Methodist University

Design and Analysis of Bistable Shells With Steered Fiber Paths for Deployable Space Structural Applications, {SSDM2024-121126}
Technical Paper Publication
- Armanj Hasanyan - University of Texas at El Paso
- Cesar Moriel - University of Texas at El Paso
- Andrew Lee - North Carolina State University
- Niccoli Scalice - Kirtland Air Force Base (KAFB)

Folding and Deployment Simulation of Ultra-Thin Composite Deployable Structures via Refined One-Dimensional Beam Finite Elements, {SSDM2024-121487}
Technical Presentation Only
- Riccardo Augello - California Institute of Technology
- Erasmo Carrera - Politecnico di Torino
- Alfonso Pagani - Politecnico di Torino
- Sergio Pellegrino - California Institute of Technology

02-01-01
General Topics of Structural Dynamics of Aerospace Structures
4/30/2024 **4:30 PM to 6:00 PM - Renton**

Chair: **Weihua Su - The University of Alabama**
Chair: **Zahra Sotoudeh - California State Polytechnic University, Pomona**

Presentations:

Physics of a Flexible Panel Subject to Shock Wave/ boundary Layer Interactions, {SSDM2024-120944}
Technical Paper Publication
Ramkumar S - Indian Institute of Technology, Bombay
Abhijit Gogulapati - Indian Institute of Technology, Bombay
Krishnendu Sinha - Indian Institute of Technology, Bombay

Multifunctional Polyvinylidene Fluoride (PVDF)-Based Polymer, Copolymer, and Compo-Sites for Aerospace Applications: A Comprehensive Technical Review, {SSDM2024-121357}
Technical Paper Publication
Nadia Ahbab - Old Dominion University
Tian-Bing Xu - Mechanical & Aerospace Engineering

Parametric Stability Analysis With Variable Fidelity Beam Formulations, {SSDM2024-121573}
Technical Paper Publication
Matteo Filippi - Politecnico Di Torino
Erasmo Carrera - Politecnico di Torino

03-03-03
Damage, Fatigue, and Fracture
4/30/2024 **4:30 PM to 6:00 PM - Baker**

Chair: **Vishnu Saseendran - Penn. State**
Chair: **Evan Pineda - NASA Glenn Research Center**

Presentations:

Computational Investigation of a Layered Fiber in a Single Fiber Pull-Out Test, {SSDM2024-137954}
Technical Presentation Only
Kyle Watson - Virginia Commonwealth University
Ibrahim Guven - Virginia Commonwealth University

Rx-Fem Modeling of Fatigue Damage Growth in Laminated Composites Under Tension and Compression Loading, {SSDM2024-138331}
Technical Presentation Only
Endel Iarve - University of Texas at Arlington
Kevin Hoos - University of Texas at Arlington Research Institute
Waruna Seneviratne - Wichita State University

Crystal Structure Effects on Crack-Path Formation in Ceramics, {SSDM2024-138374}
Technical Presentation Only
Zubaer Hossain - University of Delaware

03-07-03
Materials for Extreme Environment
4/30/2024 4:30 PM to 6:00 PM - West Seattle

Chair: **Yongming Liu - Arizona State University**
Chair: **Pavana Prabhakar - University of Wisconsin**

Presentations:

Micromechanics Damage Modeling for Fiber Reinforced Polymer Composites in Cryogenic Environments, {SSDM2024-137737}
Technical Presentation Only
- Deepak Patel - Dassault Systemes SIMULIA Corp
- Armanj Hasanyan - University of Texas at El Paso
- Miguel Mireles - University of Texas at El Paso

Investigations on Effect of Layering and Material Sequencing on Energy Absorbing Characteristics of Composite Sandwich Panels Under Extreme Loading Conditions, {SSDM2024-138566}
Technical Presentation Only
- Rohit Sankrityayan - Indian Institute of Technology Delhi
- Vivek Kumar - Indian Institute of Technology Delhi, New Delhi
- Praveen Verma - Indian Institute of Technology Delhi, New Delhi
- Anoop Chawla - Indian Institute of Technology Delhi, New Delhi
- Sudipto Mukherjee - Indian Institute of Technology Delhi, New Delhi
- Devendra Dubey - Indian Institute of Technology Delhi

Predicting Charring Behavior of Carbon-Carbon Composites, {SSDM2024-139114}
Technical Presentation Only
- Jacob Gissinger - Stevens Institute of Technology

03-04-02
Emerging Materials Technology
4/30/2024 4:30 PM to 6:00 PM - Rainier

Chair: **Shanmugam Kumar - University of Glasgow**
Chair: **Aniruddh Vashisth - University of Washington**

Presentations:

Nanomechanical Characterization of the Interface Properties of Hybrid Carbon Fibers for Multifunctional Applications, {SSDM2024-121636}
Technical Presentation Only
- Sriraj Srihari - Embry-Riddle Aeronautical University
- Rahul Sathyanath - Indian Institute of Technology Madras
- Marwan Alhaik - Kennesaw State University
- Sreeram Kalpathy - Indian Institute of Technology Madras
- Sirish Namilae - Embry-Riddle Aeronautical University

Aerogel Applications in Aerospace, {SSDM2024-121657}
Technical Presentation Only
- Haiquan Guo - Universities Space Research Association
- Stephanie Vivod - NASA Glenn Research center
- Jamesa Stokes - NASA Glenn Research center

Reinforced I-Beam Lattices With Enhanced Strength and Energy Absorption, {SSDM2024-137752}
Technical Presentation Only
- Xin Liu - University of Texas at Arlington
- Twinkle Kothari - The University of Texas at Arlington

03-11-03
NASA Thermoplastics Development for Exploration Applications (TDEA)
4/30/2024 4:30 PM to 6:00 PM - Seattle

Chair: **William Mulhearn - NASA Goddard Space Flight Center**
Chair: **Brett Bednarcyk - NASA Glenn Research Center**

Presentations:

Manufacture, Characterization, and Fusion Welding of Thermoplastic Composites for Space Applications, {SSDM2024-137639}
Technical Presentation Only
Sandi Miller - NASA
Andrew Bergan - NASA Langley Research Center
Robert Bryant - NASA Langley Research Center
Kenneth Segal - NASA Goddard Space Flight Center
Paula Heimann - NASA Glenn Research Center

Finite Element Thermal Model for Ultrasonic Welding of Thermoplastic Composites, {SSDM2024-137887}
Technical Presentation Only
Josh Fody - NASA

Multiscale Modeling of Crystallization Kinetics in Thermoplastic Polymers, {SSDM2024-134455}
Technical Presentation Only
Jamal Husseini - University of Massachusetts, Lowell
Evan Pineda - National Aeronautics and Space Administration
Scott Stapleton - University of Massachusetts, Lowell

01-09-03
Peridynamics and Its Applications
4/30/2024 4:30 PM to 6:00 PM - Bellevue II

Chair: **Erkan Oterkus - University of Strathclyde**
Chair: **Konstantin Naumenko - OVGU**
Chair: **Ibrahim Guven - Virginia Commonwealth University**

Presentations:

Refined Form of Peridynamic Equilibrium Equations, {SSDM2024-138400}
Technical Presentation Only
Erdogan Madenci - University of Arizona
Yanan Zhang - The University of Arizona
Sundaram Vinod K. Anicode - The University of Arizona

Multi-Scale Multi-Physics Modeling of Complex Materials in Extreme Environments, {SSDM2024-139355}
Technical Presentation Only
Rae Waxman - CFD Research Corporation
David Newsome - CFD Research Corporation
Andreas Hoffie - CFD Research Corporation
Jared Magnusson - CFD Research Corporation

Weak Form of Bond-associated Peridynamic Differential Operator for Failure Analysis of Anisotropic Materials, {SSDM2024-122062}
Technical Presentation Only
Qizheng Wang - Shanghai Jiao Tong University
Yile Hu - Shanghai Jiao Tong University
Yin Yu - Shanghai Jiao Tong University
Dan Wu - Shanghai Jiao Tong University
Zhiyang Yao - Shanghai Jiao Tong University

01-03-02
Advanced Manufacturing for Aerospace Structures
4/30/2024 **4:30 PM to 6:00 PM - Bellevue I**

Chair: **Yingtao Liu - University of Oklahoma**
Chair: **Dong Lin - Oregon State University**
Chair: **Christopher Billings - University of Oklahoma**

Presentations:

Modeling Flow of Long Discontinuous Fiber Reinforced Polymer Pellets in a Single Screw Extruder, {SSDM2024-121645}
Technical Presentation Only
Vasudha Kapre - Purdue University
Eduardo Barocio - Purdue University
Byron Pipes - Purdue University

Enhancing Carbon Fiber Reinforced Polymer Composites by 3d Printing Optimization, {SSDM2024-121870}
Technical Paper Publication
Xingyu Liu - Oklahoma School of Science and Mathematics
Christopher Billings - University of Oklahoma
Benjamin Sherwood - University of Oklahoma
Joshua Hall - University of Oklahoma
Caylin Nimmo - University of Oklahoma
Yingtao Liu - University of Oklahoma

Modeling Fracture Propagation in Hyperelastic Materials by Using the Non-Ordinary State-Based Peridynamics, {SSDM2024-121311}
Technical Presentation Only
Yu Jie Chen - Southern University of Science and Technology
Yang Yang - Lomonosov Moscow State University
Yijun Liu - Southern University of Science of Technology

WEDNESDAY, 5/1/2024

01-06-01
Impact, Fatigue, Damage and Fracture of Composite Structures
5/1/2024 **9:15 AM to 11:45 AM - Bellevue I**

Chair: **Weiyi Lu - Michigan State University**
Chair: **Mehmet Dorduncu - Erciyes University**
Chair: **Masaaki Nishikawa - Kyoto University**

Presentations:

Semi-Empirical Approach for the Residual Strength Prediction of Multi-Stringer Panels Subjected to Oml Bvid, {SSDM2024-138874}
Technical Presentation Only
Fernando Cuenca - The Boeing Company
Vimala Shekar - The Boeing Company
Madhavadas Ramnath - The Boeing Company

Low Velocity Impact Response of Hat-Stiffened Composite Coupons, {SSDM2024-132250}
Technical Presentation Only
Andrew Seamone - University of Michigan
Siddhant Devaru - University of Michigan
Anthony Waas - University of Michigan
Vipul Ranatunga - Air Force Research Laboratory

A Parametric Study for Low-Velocity Impact Modeling of Fiber-Reinforced Composites Using Shell Elements: Guidelines for Finite Element Analysis, {SSDM2024-125324}
Technical Presentation Only
Amir Baharvand - University of Maine
Amrit Shankar Verma - University of Maine

Advanced Energy Mitigation Mechanism of Liquid Suspension of Hollow Glass Microsphere Reinforced Thin-Walled Tube, {SSDM2024-137407}
Technical Presentation Only
Fuming Yang - Michigan State University
Mingzhe Li - Georgia Institute of Technology
Robert Mccoy - Ford Motor Company
Weiyi Lu - Michigan State University

Digital Volume Correlation Analysis of Progressive Failure in a Laminated Composite Structure, {SSDM2024-138366}
Technical Presentation Only
Chaeyoung Hong - Ulsan National Institute of Science and Technology
Wooseok Ji - Ulsan National Institute of Science and Technology

01-08-01
Nondestructive Evaluation and Structural Health Monitoring,

01-11-01
Wind Energy
5/1/2024 **9:15 AM to 11:45 AM - Rainier**

Chair: **Erkan Oterkus - University of Strathclyde**
Chair: **Kaan Ozenc - Ansys Inc.**
Chair: **Xiaowei Deng - University of Hong Kong**

Presentations:

Force Stiffness Technique for Non-Destructive Evaluation of Buckling Load of Oblate Ellipsoidal Shells, {SSDM2024-120842}
Technical Paper Publication
Gopikrishna Rangarajan - IIT Hyderabad & DRDL
Ramkrishna Dinavahi - Defence Research & Development Laboratory
Gangadharan Raju - Indian Institute of Technology, Hyderabad
Prakash Chand Jain - Defence Research & Development Laboratory

A Global-Local Modeling Approach for Wave Propagation, SHM and Damage Detection in Reinforced Panels Using Integrated Piezoelectric Sensors, {SSDM2024-121613}
Technical Paper Publication
Enrico Zappino - Politecnico di Torino
Jamal Najd - Université de Technologie de Compiègne
Erasmo Carrera - Politecnico di Torino
Walid Harizi - Université de Technologie de Compiègne
Zoheir Aboura - Université de Technologie de Compiègne

Defect Parameters Effects on Ultrasonic Guided Waves Scattering by Hybrid Global-Local Method for Damage Characterization, {SSDM2024-137896}
Technical Presentation Only
Margherita Capriotti - San Diego State University
Mingyue Zhang - San Diego State University
Antonino Spada - University of Palermo

Numerical Modeling and Analysis of Breathing-Induced Displacements in a Wind Turbine Blade Trailing-Edge Panel: A Parametric Study, {SSDM2024-121390}
Technical Paper Publication
Patrick Moroney - University of Maine
Amrit Verma - University of Maine

Effect of Hybrid Lay-Up on Tensile Properties of Interlayer Hybrid Glass/carbon Non-Crimp Fabric Composites, {SSDM2024-137779}
Technical Presentation Only
Amir Baharvand - University of Maine
Amrit Shankar Verma - University of Maine
Julie Teuwen - Delft University of Technology

01-10-01
Structures in Extreme Environments
5/1/2024 **9:15 AM to 11:45 AM - Bellevue II**

Chair: **Ibrahim Guven - Virginia Commonwealth University**
Chair: **Zafer Kazanci - Queen's University Belfast**

Presentations:

A Comparative Analysis of the Absorption Characteristics of an Aramid Honeycomb and Re-Entrant Auxetic Core Under Bird-Strike on the Leading Edge of an Evtol Composite Wing, {SSDM2024-125852}
Technical Presentation Only
Eray Kayar - Queens University Belfast
Zafer Kazanci - Queens University Belfast
Gasser Abdelal - Queens University Belfast
Martin Gillen - Spirit AeroSystems
Stephen Mcburney - Spirit AeroSystems

Jonathan Moore - Spirit AeroSystems
Michael Rooney - Spirit AeroSystems

Investigation of Deformation and Damage on Metallic Targets Due to High-Speed Particle Impacts, {SSDM2024-137453}
Technical Presentation Only
Riza Kaan Gonuleri - Virginia Commonwealth University
Ibrahim Guven - Virginia Commonwealth University

Exploring Fluid-Thermal Coupling and Modeling Strategies in the Gap Region of High-Speed All-Moveable Control Surfaces, {SSDM2024-137497}
Technical Presentation Only
Jon Willems Jr. - The Ohio State University
Jack Mcnamara - The Ohio State University
Daniel Reasor - Air Force Research Laboratory

Design and Evaluation of Deployable Perovskite Solar Arrays Aboard Small Spacecraft, {SSDM2024-121330}
Technical Paper Publication
So Yeon Suk - Tokyo Institute of Technology
Motoki Moritani - Tokyo Institute of Technology
Hiraku Sakamoto - Tokyo Institute of Technology
Tamotsu Horiuchi - EneCoat Technologies Co., Ltd.
Ryota Takabe - EneCoat Technologies Co., Ltd.
Yuko Hisada - EneCoat Technologies Co., Ltd.
Rie Tokuda - EneCoat Technologies Co., Ltd.
Osamu Mori - Japan Aerospace Exploration Agency
Hiroyuki Toyota - Japan Aerospace Exploration Agency
Yu Miyazawa - Japan Aerospace Exploration Agency
Masanori Matsushita - The University of Tokyo
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Atsuki Ochi - Tokyo Institute of Technology
Delburg Mitchao - Tokyo Institute of Technology
Yuki Takeda - Tokyo Institute of Technology
Mitsuhiko Yasuhara - Tokyo Institute of Technology
Soma Saito - Tokyo Institute of Technology
Takashi Tomura - Tokyo Institute of Technology

Dynamic Wind Farm Cooperative Control Under Heterogeneous and Changing Inflow Conditions, {SSDM2024-138410}
Technical Presentation Only
Xiaowei Deng - The University of Hong Kong
Shanghui Yang - The University of Hong Kong

02-07-01
Nonlinear Dynamics, Flexible Multibody and Structures
5/1/2024 9:15 AM to 11:45 AM - Renton

Chair: **Weihua Su - The University of Alabama**
Chair: **Matteo Filippi - Politecnico di Torino**

Presentations:

Adaptive Aeroelastic Wing – Enabling Sustainable Aviation
Structural Dynamics Track Keynote
Dr. Nhan Nguyen- NASA Ames Research Center

Multidimensional Finite Element Models for Geometrically Nonlinear Dynamic Analyses of Rotating Blades, {SSDM2024-121460}
Technical Paper Publication
Rodolfo Azzara - Politecnico di Torino
Matteo Filippi - Politecnico Di Torino
Erasmo Carrera - Politecnico di Torino

The Vibration Analysis of Timoshenko Beams With the Arbitrary Initial Deformation, {SSDM2024-137592}
Technical Presentation Only
Ji Wang - Ningbo University
Tianzhe Zheng - Ningbo University
Huimin Jing - Ningbo University
Hui Chen - Ningbo University

Reducing Peak Water Entry Forces Without Loss in Efficiency, {SSDM2024-137900}
Technical Presentation Only
Bart Boom - University of Washington
Ed Habtour - University of Washington
Tadd Truscott - King Abdullah University of Science and Technology
Frank Fish - West Chester University
Adam Summers - University of Washington

03-08-01
Micromechanics and Multiscale Modeling
5/1/2024 9:15 AM to 11:45 AM - Baker

Chair: **Gregory Odegard - Michigan Tech University**
Chair: **Haoyan Wei - Ansys Inc.**

Presentations:

Variational Asymptotic Analysis of Beam-Like Cord-Rubber Composites, {SSDM2024-121578}
Technical Paper Publication
Fang Jiang - Envision Energy
Wenbin Yu - Purdue University

Process Modeling of a Bismaleimide Thermoset Using Molecular Dynamics Simulation, {SSDM2024-124118}
Technical Presentation Only
Trevor Wavrunek - Michigan Technological University
Sagar Patil - Michigan Technological University
Swapnil Bamane - Michigan Technological University
Joshua Kemppainen - Michigan Technological University
Marianna Maiarru - University of Massachusetts Lowell
Gregory Odegard - Michigan Technological University

Failure Prediction in Functionalized Cnt-Polymer Composite Materials Using Molecular Dynamics, {SSDM2024-134323}
Technical Presentation Only
Swapnil Bamane - Michigan Technological University
Prathamesh Deshpande - San Jose State University
Prashik Gaikwad - Michigan Technological University
Josh Kemppainen - Michigan Technological University
Gregory Odegard - Michigan Technological University

Calibration of Advanced Composite Materials in a Multiscale Framework, {SSDM2024-136303}
Technical Presentation Only
Deepak Kumar Patel - Dassault Systemes Americas Corp

Protocols for the Estimation of the Extreme Value Distributions of Stresses Driving Damage Initiation in Polymer Matrix Composites, {SSDM2024-137515}
Technical Presentation Only
Jihye Hur - Georgia Institute of Technology

03-10-01
Nanomaterials
5/1/2024 9:15 AM to 11:45 AM - Seattle

Chair: **Jingyao Dai - Massachusetts Institute of Technology**
Chair: **Samit Roy - University of Alabama**

Presentations:

Predicting Fracture Toughness in Polymers Using a Novel Atomistic-Continuum Concurrent Coupling Technique, {SSDM2024-121577}
Technical Paper Publication
Sankha Aditya - University of Alabama
Samit Roy - University of Alabama

The Influence of Nanofillers and Surface Treatment on Mechanical Properties of Ceramic Composite, {SSDM2024-121468}
Technical Presentation Only
Laxmi Sai Viswanadha - Texas A&M University
Mohammad Naraghi - Texas A&M University

Mechanical Response of Nanoarchitected Composites at Quasi-Static and High Strain-Rates, {SSDM2024-121602}
Technical Presentation Only
Kevin Nakahara - Caltech
Matias Kagais - Lund
Barry Lawlor - Caltech
Julia Greer - Caltech

Fabrication and Characterization of Ceramic Matrix Nanocomposites With Aligned Nanofibers of Ultrahigh Packing Density, {SSDM2024-136915}
Technical Presentation Only
Jingyao Dai - Massachusetts Institute of Technology
Shaan Jagani - Massachusetts Institute of

Technology
Cameron Hilman - Massachusetts Institute of Technology
Luiz Acauan - Massachusetts Institute of Technology
Palak Patel - Massachusetts Institute of Technology
Brian L. Wardle - Massachusetts Institute of Technology

In-Situ Observation of Resin Infusion and Void Evolution During Nanoporous Network Enabled Out-of-Autoclave Manufacturing of Aerospace-Grade Composite Using X-Ray Micro-Ct, {SSDM2024-137788}
Technical Presentation Only
Jingyao Dai - Massachusetts Institute of Technology
Alisa Webb - Massachusetts Institute of Technology
Brian L. Wardle - Massachusetts Institute of Technology

03-02-02
Advanced Manufacturing
5/1/2024 9:15 AM to 11:45 AM - West Seattle

Chair: **Pavana Prabhakar - University of Wisconsin-Madison**
Chair: **Yeqing Wang - Syracuse University**

Presentations:

Contribution of Build Interrupts in Laser Powder Bed Fusion to the Resistance to Fracture of Ti6al4v, {SSDM2024-120672}
Technical Presentation Only
Conall Wisdom - University of Washington
Ruben Sun - University of Washington
Cole Nouwens - University of Washington
Aaron Abeyta - University of Washington
Cade Greseth - University of Washington
Mamidala Ramulu - University of Washington
Dwayne Arola - University of Washington

Analysis of the Gas Flow Distribution in Laser Powder Bed Fusion Utilizing Particle Image Velocimetry, {SSDM2024-121479}
Technical Presentation Only
Aaron Abeyta - University of Washington
Jack Hardy - University of Washington
Marco Iacoviello - University of Washington
Aaron Maschhoff - University of Washington
Yuliya Pruzhanskaya - University of Washington
Mamidala Ramulu - University of Washington
Dwayne Arola - University of Washington

Obliteration of Semi-Porous Construction Lattices for Ti6al4v Laser Powder Bed Fusion Structure With the Cavitation Abrasive Surface Finishing Method, {SSDM2024-121607}
Technical Presentation Only
Daniel Sanders - Sugino Machine Ltd
Dwayne Arola - University of Washington
Melody Mojib - University of Washington
Cole Nouwens - University of Washington
Mamidala Ramulu - University of Washington
Alex Montelione - University of Washington
Rohin Petram - University of Washington
Conall Wisdom - University of Washington

Nanocrystal Functionalized Natural Fiber-Reinforced Green Composites: Interfacial Modification and Additive Manufacturing, {SSDM2024-121634}
Technical Presentation Only
Yuxuan Wu - Embry-Riddle Aeronautical University
Zhouyan Yang - Embry-Riddle Aeronautical University
Yizhou Jiang - Embry-Riddle Aeronautical University
Sirish Namilae - Embry-Riddle Aeronautical University

Characterization of Microstructural Defects in Upcycled Tow-Based Discontinuous Composites, {SSDM2024-137907}
Technical Presentation Only
Yasmeen Shahin - University of San Diego
Luca Sacchetto - University of San Diego
Rodrigo Martinez - University of San Diego
Alejandra Castellanos - The University of Texas at El Paso
Paulina Diaz-Montiel - University of San Diego

02-06-01
Structural Dynamics and Control of Aerospace Structures
5/1/2024 1:15 PM to 3:45 PM - Renton

Chair: **Weihua Su - The University of Alabama**
Chair: **Zhangxian Yuan - Worcester Polytechnic Institute**

Presentations:

Biomimetic Scaled Structures - Exploring Symmetries and Nonlinearity in Structural Damping, {SSDM2024-121653}
Technical Paper Publication
- Md Shahjahan Hossain - University of Central Florida, Orlando FL
- Omid Bateniparvar - University of Central Florida, Orlando
- Pranta Rahman Sarkar - University of Central Florida, Orlando
- Ranajay Ghosh - University of Central Florida

Heterogeneous Stiffness in Stingray Fins for Simplified Undulatory Propulsion, {SSDM2024-137916}
Technical Presentation Only
- John Michael Racy - University of Washington
- Ed Habtour - University of Washington
- Adam Summers - University of Washington

Optimal Cable-Stayed Configurations for Pretensioned Space Structures, {SSDM2024-121579}
Technical Paper Publication
- Jacob Daye - North Carolina State University
- Andrew Lee - North Carolina State University
- Cody Griffee - Redwire Space
- Niccoli Scalice - Air Force Research Laboratory

A Consistent and Conservative Modular Aeroelastic Coupling Methodology for Multidisciplinary Design Optimization, {SSDM2024-137946}
Technical Presentation Only
- Sebastiaan Van Schie - University of California San Diego
- John Hwang - University of California San Diego

Modal Sensitivity Analysis of Self-Deployable Tape-Spring Booms for Cubesats, {SSDM2024-138370}
Technical Presentation Only
- Deven Mhadgut - Virginia Tech
- Austin Phoenix - Virginia Tech
- Jonathan Black - Virginia Tech

03-01
General Topics of Aerospace Materials
5/1/2024 1:15 PM to 3:45 PM - Rainier

Chair: **Navid Zobeiry - University of Washington**
Chair: **Yongming Liu - Arizona State University**

Presentations:

Laser Powder Bed Fusion of Ti-6al-4v: Control and Mitigation of Process Waste By-Products, {SSDM2024-120955}
Technical Presentation Only
- Alex Montelione - University of Washington
- Rick Schleusener - University of Washington
- Dwayne Arola - University of Washington
- Mamidala Ramulu - University of Washington

Fused Filament Fabrication With Ultem 9085: An Assessment of Degradation in Marine Environments, {SSDM2024-137172}
Technical Presentation Only
- Xirong Wang - University of Washington
- Mark Sorna - Naval Undersea Warfare Center: Keyport Division
- Dwayne Arola - University of Washington

Optimizing Uavs Material Viability Through Machine Learning and Digital Twins: A Review, {SSDM2024-137576}
Technical Presentation Only
- Aadit Kannan - New Mexico Institute of Mining and Technology
- Daniel Ticau - New Mexico Institute of Mining and Technology
- Sidak Sandhu - New Mexico Institute of Mining and Technology

Investigating Collapse Resistant Mechanisms Exhibited in Fire Ant Nest Geometries, {SSDM2024-137912}
Technical Presentation Only
- Tyler Felgenhauer - San Diego State University
- Satchi Venkataraman - San Diego State University

Data-Driven Modeling of Actuation and Pseudoelasticity in Shape Memory Alloys, {SSDM2024-138885}
Technical Presentation Only
- Haoyi Tian - Texas A&M University
- Jobin Joy - Texas A&M University
- Dimitris Lagoudas - Texas A&M University

03-02-01
Advanced Manufacturing
5/1/2024 **1:15 PM to 3:45 PM - West Seattle**

Chair: **Dwayne Arola - University of Washington**
Chair: **Xiangyang Dong -**

Presentations:

A Comprehensive Study on Optimizing 3D Printing Parameters for Improved Mechanical Properties of PLA and ABS Polymer, {SSDM2024-121323}
Technical Paper Publication
- Habeeb Talha Shahan - Tuskegee University
- Shaik Zainuddin - Tuskegee University
- G. M. Sayeed Ahmed - Adama Science and Technology University
- Richard Harry - Tuskegee University

Thermal Characterization of Xenon Flash Lamp System for Automated Fiber Placement, {SSDM2024-121589}
Technical Paper Publication
- Devang Tavkari - University of Texas at Arlington
- Paul Davidson - University of Texas at Arlington

Advancing Environmental Sustainability Through Development of Wood Fiber Reinforced Polymer Composites, {SSDM2024-121871}
Technical Paper Publication
- Ridwan Siddique - University of Oklahoma
- Christopher Billings - University of Oklahoma
- Benjamin Sherwood - University of Oklahoma
- Joshua Hall - University of Oklahoma
- Yingtao Liu - University of Oklahoma

Efficient Manufacturing of Carbon Fiber Epoxy Resin Composite Laminates Using Uv-Induced Frontal Polymerization, {SSDM2024-137317}
Technical Presentation Only
- Yeqing Wang - Syracuse University
- Amirreza Tarafdar - Syracuse University

In-Space Assembly of Large Mesh Reflector Antennas, {SSDM2024-137740}
Technical Presentation Only
- Jong-Eun Suh - California Institute of Technology
- Sahangi Dassanayake - California Institute of Technology
- Mark Thomson - Tendeg
- Sergio Pellegrino - California Institute of Technology

03-03-01
Damage, Fatigue, and Fracture
5/1/2024 **1:15 PM to 3:45 PM - Baker**

Chair: **Evan Pineda - NASA Glenn Research Center**
Chair: **Rassel Raihan - University of Texas at Arlington**

Presentations:

Method Development Towards Strength and Flaw Characterization of Single Carbon Fibers, {SSDM2024-121474}
Technical Paper Publication
- Andrew Dockter - Montana State University
- Ryan Decker - Montana State University
- David Forslof - Montana State University
- Matthew Egloff - Montana State University
- Douglas Cairns - Montana State University
- Dilpreet Bajwa - Montana State University
- Christopher Ridgard - Montana State University
- Jared Nelson - Keene State College
- Roberta Amendola - Montana State University
- Cecily Ryan - Montana State University

Progressive Damage Analysis of Curved Composite Laminates Incorporating Effects of Manufacturing Using a Semi-Discrete Damage Model, {SSDM2024-121556}
Technical Paper Publication
- Sai Krishna Meka - Purdue University
- Ryan Enos - Purdue University
- James Roach - University of Connecticut
- Dianyun Zhang - Purdue University

Determination of Cohesive Traction Separation Curve for Z-Pinned Interface Using Two Scale Homogenization, {SSDM2024-121575}
Technical Paper Publication
- Paul Davidson - UTA

Helicopter Spindle Separation in Erie, Co, {SSDM2024-120972}
Technical Presentation Only
- Adrienne Lamm - National Transportation Safety Board (NTSB)

Self-Healing of High Performance Vitrimer Carbon Fiber Reinforced Polymer Composites, {SSDM2024-121319}
Technical Presentation Only
- Tanaya Mandal - Texas A&M University
- Jacob Meyer - ATSP Innovations
- Mohammad Naraghi - Texas A&M University

03-09-01
Multifunctional Materials
5/1/2024 **1:15 PM to 3:45 PM - Bellevue II**

Chair: **Ajit K Roy - Air Force Research Lab**
Chair: **Aniruddh Vashisth - University of Washington**

Presentations:

Wear Resistant MoS2 Thin Films Enabled by Chromium Underlayer, {SSDM2024-121410}
Technical Paper Publication
- Nihal Ahmed - University of Arkansas at Little Rock
- Sujan Ghosh - University of Arkansas at Little Rock

Novel Polyetheretherketone/Polytetrafluoroethylene Composites Reinforced With Titanium Silicon Carbide for Conveyor Chute, {SSDM2024-121599}
Technical Paper Publication
- Nihal Ahmed - University of Arkansas at Little Rock
- Nzubechukwu Okolie - University of Arkansas at Little Rock
- Sujan Ghosh - University of Arkansas at Little Rock

Fatigue Delamination Damage Sensing and Self-Healing in Thermoset Composites Using Thermoplastic Healants, {SSDM2024-121605}
Technical Paper Publication
- Nilesh Vishe - The University of Alabama
- Sankha Aditya - The University of Alabama
- Sameer Mulani - The University of Alabama
- Samit Roy - The University of Alabama

Analytical and Numerical Modeling of a Thermal Switch via Shape Changing Stimuli-Responsive Material, {SSDM2024-121609}
Technical Paper Publication
- Charles Abdol-Hamid Owens - University of California, Irvine
- Shiva Farzinazar - University of California, Irvine
- Jaeho Lee - University of California, Irvine

Self-Healing and Thermal Transport Behavior in Vitrimer-Graphene Composite, {SSDM2024-121644}
Technical Presentation Only
- Md Sherajul Islam - Air Force Research Laboratory
- Dhriti Nepal - Air Force Research Laboratory
- Vikas Varshney - Air Force Research Laboratory
- Ajit K Roy - Air Force Research Laboratory

01-06-02
Impact, Fatigue, Damage and Fracture of Composite Structures
5/1/2024 **1:15 PM to 3:45 PM - Bellevue I**

Chair: **Weiyi Lu - Michigan State University**
Chair: **Mehmet Dorduncu - Erciyes University**
Chair: **Masaaki Nishikawa - Kyoto University**

Presentations:

Fastdm4c: A Fast and Efficient Discrete Model for Composites, {SSDM2024-137763}
Technical Presentation Only
- Antonio Alessandro Deleo - ES3
- Sean Phenisee - ES3
- Daniele Pelessone - ES3
- Mark Flores - Air Force Research Laboratory
- Marco Salviato - University of Washington

A Novel Discrete, Mesoscale Modeling Framework for the Simulation of the Damaging and Fracturing Behavior of Composites, {SSDM2024-137794}
Technical Presentation Only
- Marco Salviato - Department of Civil and Environmental Engineering
- Antonio Deleo - ES3 inc
- Sean Phenisee - ES3 Inc
- Mark Flores - Air Force Research Laboratory
- Daniele Pelessone - ES3 Inc

Understanding the Kinematics and Mechanical Behavior of Architected Composite Structures via Mechanical Tests Instrumented With Optical Cameras, {SSDM2024-121295}
Technical Presentation Only
- Juan Manuel García - ONERA
- Jules Luco - ONERA
- Grégoire Morel - ONERA
- François-Henri Leroy - ONERA
- Cédric Huchette - ONERA
- Cédric Julien - ONERA
- François-Xavier Irisarri - ONERA

Representation, Fidelity, Accuracy and Computational Cost Trade-Offs in Bearing Failure Response Prediction of Fiber Metal Laminate Bolted Joints, {SSDM2024-135265}
Technical Presentation Only
- Eric Maravilla - San Diego State University

Rohit Madke - San Diego State University
Satchi Venkataraman - San Diego State University

Influence of Stacking Sequence on Bearing Performance of Cfrp/steel Fiber Metal Laminate Bolted Joints, {SSDM2024-137810}
Technical Presentation Only
Rohit Madke - San Diego State University
Jeron Rollins - San Diego State University
Eric Maravilla - San Diego State University
Satchi Venkataraman - San Diego State University

03-09-02
Multifunctional Materials
5/1/2024 **1:15 PM to 3:45 PM - Seattle**

Chair: **Shanmugam Kumar - University of Glasgow**
Chair: **Ajit K Roy - Air Force Research Lab**

Presentations:

Multifunctional Mechano-Luminescence-Optoelectronic Fibers for Improving Self-Sustainability of Aerospace Structures, {SSDM2024-123742}
Technical Presentation Only
Donghyeon Ryu - New Mexico Tech
Geronimo Macias - New Mexico Tech
Derek Plummer - New Mexico Tech
William Fawcett - New Mexico Tech

Impact-Resistant Architected Instability-Based Metamaterials (Aims), {SSDM2024-137171}
Technical Presentation Only
Yunlan Zhang - University of Texas - Austin
Li Wan - University of Texas at Austin

Multifunctional Coating Development for Oxygen Generation in Built Space Environments, {SSDM2024-137735}
Technical Presentation Only
Maggie Nelson - Auburn University
Diego Gomez-Maldonado - Northeastern University
Maria Soledad Peresin - Auburn University
Russell Mailen - Auburn University

PAPER REVIEWERS

Reviewer Name	Reviewer Name	Reviewer Name
Alexandru Stere	Kailong Jin	Samuel Ambosta
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Palak Patel	136915	03-10-01
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Paul Davidson	121575	03-03-01
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Xirong Wang	137172	03-01
Yakubu Kasimu Galadima	131192	01-09-01
Yanan Zhang	138396	01-09-01
Yanan Zhang	138400	01-09-03
Yang Yang	121311	01-03-02
Yao Qiao	120848	03-13-01
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Yao Qiao	121669	03-13-01
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Yao Sun	137861	03-02-03
Yasmeen Shahin	137907	03-02-02
Yeqing Wang	137317	03-02-01
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Yijun Liu	121311	01-03-02
Yile Hu	122062	01-09-03
Yile Hu	122321	03-07-01
Yin Yu	122062	01-09-03
Yin Yu	122321	03-07-01
Yingtao Liu	121490	01-03-01
Yingtao Liu	121870	01-03-02
Yingtao Liu	121871	03-02-01
Yiwen Zheng	121400	03-06
Yizhou Jiang	121634	03-02-02
Yongming Liu	137673	03-03-02
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Yongsoon Shin	121222	03-13-01
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Yuko Hisada	121330	01-10-01
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Yunlan Zhang	137171	03-09-02
Yuxuan Wu	121634	03-02-02
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Zachary Riley	133498	02-04-01
Zachary Riley	133511	02-04-01
Zafer Kazanci	125852	01-10-01
Zahed Siddique	121490	01-03-01
Zahra Sotoudeh	137560	02-05-01
Zahra Sotoudeh	137570	02-05-01
Zhangxian Yuan	137214	01-01-02
Zhiqing Zhang	121245	03-05-02
Ernian Pan	121245	03-05-02
Zhiyang Yao	122062	01-09-03
Zhouyan Yang	121634	03-02-02
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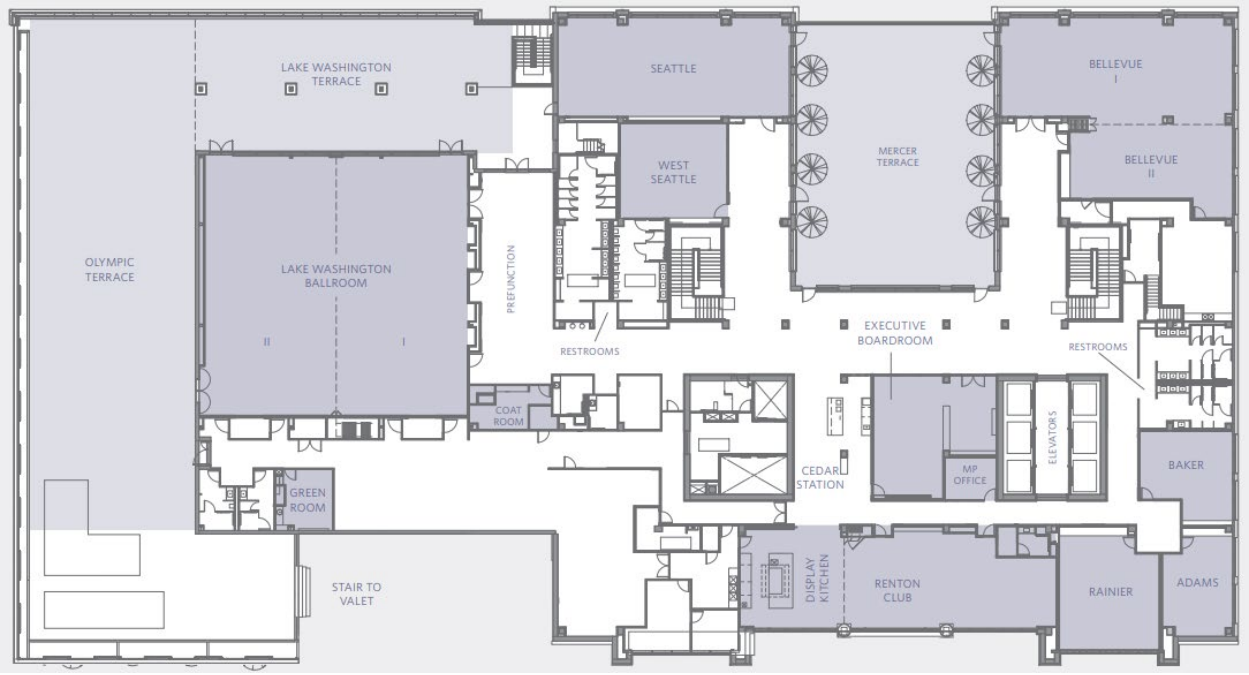
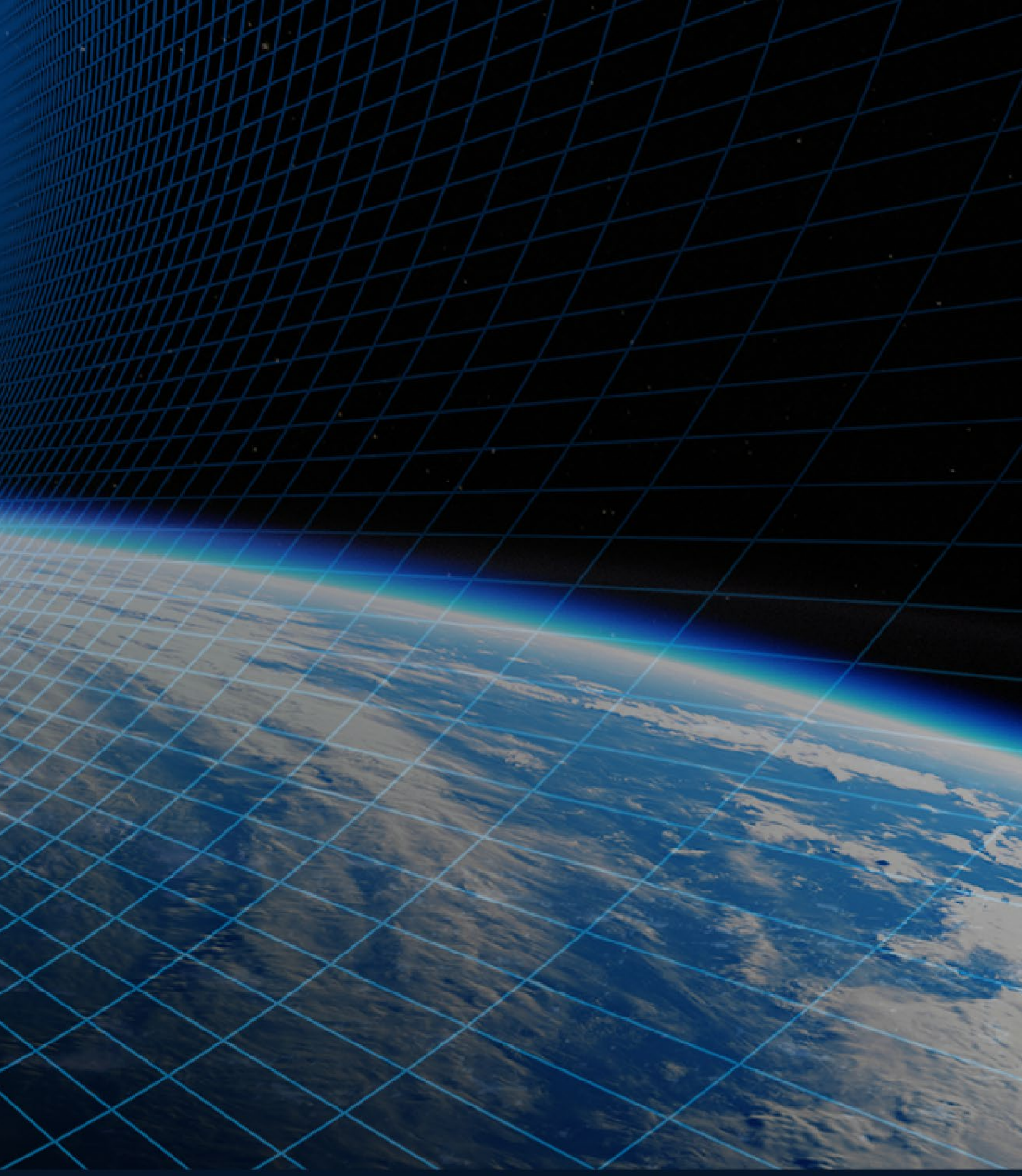
HOTEL FLOOR PLAN

THIRD FLOOR:

All ASME SSDM programing will take place within the third-floor meeting space at the hotel.





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