SSDM 2026

AEROSPACE STRUCTURES, STRUCTURAL DYNAMICS, AND MATERIALS

CONFERENCE
JUNE 8 - 10, 2026

HILTON LONG BEACH
LONG BEACH, CA

PROGRAM

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Dear Esteemed Attendees,

It gives us great pleasure to welcome you to the fourth edition of the Aerospace Structures, Structural Dynamics, and Materials (SSDM) Conference at the Hilton Long Beach, in Long Beach, California, 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. 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, invited session speakers, 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 2027.

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

ASME SSDM Organizing Committee,

Erasmo Carrera, Yongming Liu, Ibrahim Guven, Erkan Oterkus, Wenbin Yu,

Ali Najafi, Alexandru Stere, Mehmet Dorduncu , Wei Zhao, Navid Zobeiry,

Yunlan Zhang, Jinhui Yan, Mohammad Naraghi, Marco Petrolo, Tieny Ye,

Zafer Kazanci, Weihua Su, Yi Wang, Ellen Gillespie, Amentum Zahra Sotoudeh,

Jacob Rome, Sergio Pellegrino, and Luciano Demasi

SSDM 2026 ORGANIZING COMMITTEE

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CONFERENCE INFORMATION

REGISTRATION INFORMATION

Ballroom Foyer, Second Floor

Registration Hours:

Sunday, June 7	2:00PM–5:00PM
Monday, June 8	7:00AM–5:00PM
Tuesday, June 9	7:00AM–5:00PM
Wednesday, June 10	7:00AM–12:00PM

BADGE REQUIRED FOR ADMISSION: All conference attendees must have an official ASME SSDM 2026 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 Ballroom Foyer, Second Floor, 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 have a copy of their presentation loaded onto a memory stick. It is recommended that authors/speakers bring all visual aids with them.

ASME EVENTS APP: SSDM will utilize a mobile event app 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
- And More!

*All features may not be available at all events.

Keep an eye on your email for more information on how to access and navigate the ASME Events App!

CONFERENCE MEALS:

The Awards Luncheon will be on Tuesday, June 9, from 11:45AM to 1:45PM in International 3-5, where we will celebrate a select group for their contributions and achievements in aerospace engineering.

OPENING RECEPTION:

Monday, June 8
6:00PM–7:00PM
Pool Terrace

BEVERAGE BREAKS: Morning and afternoon breaks will be provided in the Ballroom Foyer, Level 4. Come and meet our sponsors and join your fellow attendees for a few minutes of networking and discussion. The schedule is as follows:

Monday, June 8	7:00AM-7:45AM
	3:15PM–3:45PM
Tuesday, June 9	7:00AM-7:45AM
	4:00PM–4:30PM
Wednesday, June 10	7:00AM-7:45AM
	9:00AM-9:15AM

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LIMITATION OF LIABILITY: You agree to release and hold harmless ASME from any and 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 on 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 2026 TOPICS & TOPICS ORGANIZERS

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

STRUCTURES TOPICS	STRUCTURES TOPIC ORGANIZERS
General Topics of Aerospace Structures	Ibrahim Guven and Hailong Chen
Adaptive and Multifunctional Structures	Xing Ning and Zubaer Hossain
Advanced Manufacturing for Aerospace Structures	Yingtao Liu, Christopher Billings, and Alexandru I. Stere
Advances in Aerospace Structures	Luciano Demasi and Wei Zhao
Applications of Artificial Intelligence/Machine Learning for Aerospace Structures	Xin Liu and Fei Tao
Design Optimization of Aerospace Applications from a Systems Approach	Scully Fitzgibbons and Meysam Nazr Azadani
Impact, Fatigue, Damage and Fracture of Composite Structures	Mehmet Dordunc, Masaaki Nishikawa, and
In-Space Additive Manufacturing	Jacob I. Rome and Avin Vijay
Nondestructive Evaluation and Structural Health Monitoring	Erkan Oterkus, John Wertz, and Hasan Huseyin Camuz
Peridynamics and Its Applications	Erdogan Madenci, Selda Oterkus, and Ibrahim Guven

STRUCTURAL DYNAMICS TOPICS	STRUCTURAL DYNAMICS TOPIC ORGANIZERS
Aero-, Servo-, Thermo-Elasticity of Aircraft, Rotorcraft and Spacecraft	Vincenzo Gulizzi, Daning Huang, and Marco Petrolo
Rotordynamics	Matteo Filippi and Tianyi He
Aeroacoustics and Vibroacoustics	Zahra Sotoudeh and Marco Petrolo
Nonlinear Dynamics and Flexible Multibody Dynamics	Gabriele Dessena, Leixin Ma, Aykut Tamer, and Vincenzo Gulizzi
Dynamic Loads, Wave Propagations, Response, Vibration, Control, and Alleviation of Aerospace Structures and Vehicles	Wen Luo, Maya Pishvar, Matteo Filippi, and Tianyi He
Computational Methods and Modelling	Zafer Kazanci, Yi Wang, and Zhangxian Yuan
Experimental Studies in Structural Dynamics	Weihua Su, Gabriele Dessena and Aykut Tamer
Machine Learning in Structural Dynamics and Aeroelasticity	Zahra Sotoudeh and Leixin Ma
Model Uncertainties and Uncertainty Quantification in Structural Dynamics	Wen Luo and Yi Wang
General Topics of Structural Dynamics of Aircraft, Rotorcraft, and Spacecraft Structures	Zafer Kazanci and Weihua Su
Aero-, Servo-, Thermo-Elasticity of Aircraft, Rotorcraft and Spacecraft	Vincenzo Gulizzi, Daning Huang and Marco Petrolo
Rotordynamics	Matteo Filippi and Tianyi He

MATERIALS TOPICS	MATERIALS TOPIC ORGANIZERS
Advanced Manufacturing	Jinhui Yan and Tianyang Zhou
Applications of AI	Ibrahim Kaleel, Vikas Varshney, Shiyao Lin, and Jie Chen
Architected Materials/Metamaterials	Susmita Naskar, Tanmoy Mukhopadhyay, and Yanyu Chen
Bioinspired Materials	Vanessa Restrepo and Sung Hoon Kang
Damage, Fatigue, and Fracture	Paulina Diaz-Montiel and Shiyao Lin
Emerging Materials Technology	Navid Zobeiry
General Topics of Aerospace Materials	Alexandru Stere, Dragos Margineantu, and Vishnu Saseedran
Integrated Computational Materials Engineering (ICME)	Marco Salviato and Enrico Zappino
Materials for Extreme Environments	Yunlan Zhang, Yu Cheng, and Hailong Chen
Micromechanics and Multiscale Modeling	Ning Liu, Evan Pineda, and Haoyan Wei
Multifunctional Materials	Mohammad Naraghi, Jizhe Cai, and Shanmugam Kumar
Structural Bonding and Surface Modifications	Yao Qiao and Arief Yudhanto
Testing and Characterization	Rassel Raihan and Navid Zobeiry

SSDM 2026 SESSION ORGANIZERS

Session Title	Session Organizer
01-01-01: Advanced Structural Mechanics and Computational Methods for Aerospace Applications	Wei Zhao and Yongming Liu
01-01-03: Advanced Computational Methods and Multiphysics Analysis for Aerospace Structures	Erkan Oterkus and Linqi Zhuang
01-01-04: High-Fidelity and Emerging Computational Methods for Aerospace Structures	Erasmo Carrera and Ali Najafi
01-02-01: Adaptive and Multifunctional Aerospace Structures	Wei Zhao and Yongming Liu
01-03 -01: Advanced Manufacturing and Process–Structure Relationships in Aerospace Structures	Ali Najafi and Wei Zhao
01-05-01: Foundations of AI and Machine Learning for Aerospace Structural Analysis	Xin (Jeffrey) Liu and Fei Tao
01-05-02: AI-Driven Modeling and Simulation for Aerospace Structures	Xin (Jeffrey) Liu and Fei Tao
01-05-03: Data-Driven Design and Optimization of Aerospace Structures Using AI/ML	Fei Tao and Xin (Jeffrey) Liu
01-06-01: Damage, Fatigue, and Fracture in Composite Aerospace Structures I	Linqi Zhuang
01-06-02: Damage, Fatigue, and Fracture in Composite Aerospace Structures II	Linqi Zhuang and Wenbin Yu
01-06-03: Impact, Extreme Loading, and Damage Tolerance in Aerospace Structures	Ibrahim Guven and Ali Najafi
01-07-01: Nonlinear Structural Behavior and Stability in Aerospace Systems	Wei Zhao and Luciano Demasi
01-08-01: Structural Health Monitoring and Nondestructive Evaluation I	Erkan Oterkus, John Wertz and Hasan Huseyin Camuz
01-08-02: Structural Health Monitoring and Nondestructive Evaluation II	Erkan Oterkus and Hasan Huseyin Camuz
01-09-01: Peridynamics and Nonlocal Modeling for Aerospace Structures I	Ibrahim Guven, Erdogan Madenci and Selda Oterkus
01-09-02: Peridynamics and Nonlocal Modeling for Aerospace Structures II	Selda Oterkus and Erdogan Madenci
01-09-03: Advanced Applications of Peridynamics and Nonlocal Modeling in Aerospace Structures	Selda Oterkus
01-12-01: Structural Design and Analysis of Spacecraft Structures I	Kawai Kwok and Sergio Pellegrino
01-12-02: Structural Design and Analysis of Spacecraft Structures II	Sergio Pellegrino and Kawai Kwok
01-15-01: Special Session in Honor of Professor Liviu Librescu: Advances in Aeroelasticity and Structural Mechanics	Luciano Demasi and Wei Zhao
01-16-01: In-Space Servicing, Assembly, and Manufacturing (ISAM): Structural Design and Systems	Jacob Rome and Avin Vijay
02-01-01: Aero-, Servo-, Thermo-Elasticity of Aircraft, Rotorcraft and Spacecraft	Vincenzo Gulizzi and Weihua Su
02-01-02: Aero-, Servo-, Thermo-Elasticity of Aircraft, Rotorcraft and Spacecraft	Vincenzo Gulizzi and Tianyi He
02-02-01: Nonlinear Dynamics, Flexible Multibody Dynamics and Rotordynamics	Gabriele Dessena and Aykut Tamer
02-02-02: Nonlinear Dynamics, Flexible Multibody Dynamics and Rotordynamics	Matteo Filippi and Tianyi He
02-03-01: Aeroacoustics, Dynamic Loads, Wave Propagations, Response, Vibration, Control, and Alleviation of Aerospace Structures and Vehicles	Matteo Filippi and Zahra Sotoudeh
02-03-02: Aeroacoustics, Dynamic Loads, Wave Propagations, Response, Vibration, Control, and Alleviation of Aerospace Structures and Vehicles	Tianyi He and Aykut Tamer
02-04-01: Computational Methods and Modelling	Yi Wang and Zhangxian Yuan

02-04-02: Computational Methods and Modelling	Yi Wang and Zhangxian Yuan
02-05-01: Experimental Studies in Structural Dynamics	Weihua Su and Gabriele Dessena
02-05-02: Experimental Studies in Structural Dynamics	Wen Luo and Maya Pishvar
02-06-01: Machine Learning in Structural Dynamics and Aeroelasticity	Leixin Ma and Zahra Sotoudeh
02-07-01: Space Structures	Wen Luo and Weihua Su
03-01-01: Advanced Manufacturing	Jinhui Yan and Tianyang Zhou
03-01-02: Advanced Manufacturing	Jinhui Yan and Tianyang Zhou
03-01-03: Advanced Manufacturing	Jinhui Yan and Tianyang Zhou
03-02-01: Applications of AI	Vikas Varshney, Shiyao Lin and Jie Chen
03-02-02: Applications of AI	Vikas Varshney, Navid Zobeiry, Shiyao Lin and Jie Chen
03-02-03: Applications of AI	Vikas Varshney, Shiyao Lin and Jie Chen
03-03-01: Architected materials/metamaterials	Susmita Naskar, Tanmoy Mukhopadhyay and Yanyu Chen
03-03-02: Architected materials/metamaterials	Susmita Naskar, Tanmoy Mukhopadhyay and Yanyu Chen
03-05-01: Damage, Fatigue, and Fracture	Paulina Diaz-Montiel and Shiyao Lin
03-05-02: Damage, Fatigue, and Fracture	Paulina Diaz-Montiel and Shiyao Lin
03-06-01: Emerging Materials Technology	Shanmugam Kumar and Navid Zobeiry
03-08-01: Integrated Computational Materials Engineering	Enrico Zappino and Marco Salviato
03-09-01: Materials for Extreme Environments	Yunlan Zhang and Yu Cheng
03-09-02: Materials for Extreme Environments	Yunlan Zhang and Yu Cheng
03-10-01: Micromechanics and Multiscale Modeling	Evan Pineda and Ning Liu
03-10-02: Micromechanics and Multiscale Modeling	Evan Pineda and Ning Liu
03-11-01: Multifunctional Materials	Mohammad Naraghi, Jizhe Cai and Shanmugam Kumar
03-11-02: Multifunctional Materials	Mohammad Naraghi, Jizhe Cai and Shanmugam Kumar
03-12-01: Structural Bonding and Surface Modifications	Arief Yudhanto
03-13-01: Testing and Characterization	Rassel Raihan and Navid Zobeiry
03-13-02: Testing and Characterization	Rassel Raihan and Navid Zobeiry
Poster Session	Ellen Gillespie

SSDM 2026 SCHEDULE AT A GLANCE

Schedule Subject to Change

Pacific Time	Sunday – June 7, 2026
2:00PM–5:00PM	Registration

Pacific Time	Monday – June 8, 2026
7:00AM–5:00PM	Registration
7:00AM–7:45AM	Coffee
8:00AM–9:00AM	Plenary- Anthony M. Waas
9:15AM–10:05AM	Track Keynote
9:15AM–11:45AM	Technical Sessions
11:45AM–1:30PM	Lunch Break (on own)
1:15PM–3:15PM	Technical Sessions
1:15PM–3:15PM	Poster Session
3:15PM–3:45PM	Break
3:45PM–5:45PM	Technical Sessions
6:00PM–7:00PM	Evening Reception
7:00PM–9:00PM	Technical Committee Meetings

Pacific Time	Tuesday – June 9, 2026
7:00AM–5:00PM	Registration
7:00AM–7:45AM	Coffee
8:00AM–9:00AM	Plenary - Dr. Greg Reich
9:15AM–10:05AM	Track Keynote
9:15AM–11:45AM	Technical Sessions
11:45AM–1:45PM	Awards Luncheon
2:00PM–4:00PM	Technical Sessions
4:00PM–4:30PM	Break
4:30PM–6:00PM	Technical Sessions
6:00PM–8:00PM	Technical Committee Meetings

Pacific Time	Wednesday – June 10, 2026
7:00AM–12:00PM	Registration
7:00AM–7:45AM	Coffee
8:00AM–9:00AM	Plenary - Dr. Peter Matic
8:30AM–1:00PM	Tour
9:00AM–9:15AM	Break
9:15AM–10:05AM	Track Keynote
9:15AM–11:45AM	Technical Sessions

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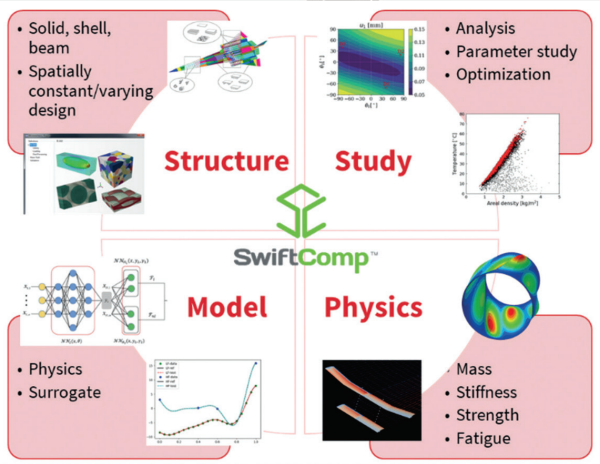
Simulation software for composites and other advanced materials that offers an unprecedented combination of efficiency and accuracy for multiscale, multiphysics modeling. Our tools enable computational design with the potential of significantly reduced physical tests and trial and errors, so you can consider more design options and arrive at the best solution more quickly.

SwiftComp™

SwiftComp™ is a general-purpose multiscale modeling code that enables users to perform efficient and accurate modeling of composites and other advanced materials (metamaterials, architected materials, porous materials, tailorable composites, etc.). SwiftComp provides efficient high-fidelity constitutive modeling for structural models including solids, plates/shells and beams. It can be used either independently as a tool for virtual testing of composites or as a plugin to power conventional FEA codes with high-fidelity multiscale modeling for composites.



DATC is a new framework centered on SwiftComp developed for the multiscale modeling, analysis, and design of advanced tailorable composites (tow-steered, variable thickness, etc.). DATC can handle multiscale parameterisation, spatially-varying design, and automated hierarchical (de)homogenisation of microstructures. Mechanical performance and coupled multi-physical analyses are available.

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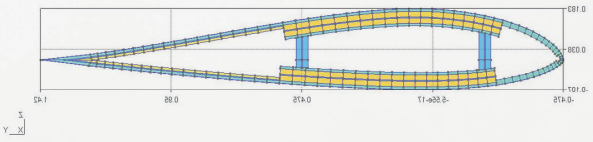
VABS™ is a general-purpose cross-sectional analysis tool for computing beam properties and stress/strains/strengths of slender composite structures. It is a powerful tool for modeling composite helicopter, air mobility/eVTOL, UAV/drone and wind turbine rotor blades, as well as other slender composite structures, such as propellers, landing gear, and high-aspect ratio wings. VABS can calculate ply-level details with the accuracy of 3D FEA in seconds on a typical laptop computer. iVABS, a new VABS-based design framework, enables VABS for design and optimization, parametric studies, uncertainty quantifications, etc., in a user-friendly way.

iVABS™



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SSDM 2026 PLENARY SESSIONS

WELCOME REMARKS
Monday, June 8 | 8:00AM

Erasmo Carrera
SSDM 2026 Conference Chair

PLENARY SESSION
Monday, June 8 | 8:00AM–9:00AM
International 3-5
Presentation Title: The Effects of Favorable Geometric Perturbations in Controlling the Collapse Response of Thin-Walled Shell Structures

Anthony M. Waas
Fulton Professor of Aerospace and Mechanical Engineering
Director, School for Engineering of Matter, Transport and Energy
Fulton School of Engineering
Arizona State University

Abstract: This work investigates how favorable geometric perturbations can be leveraged to control the collapse response of thin-walled shells—structural elements widely utilized in aerospace, civil, and naval engineering. The study considers thin-walled cylindrical shells under axial compression and spherical shells exposed to external pressure. It is well established that geometric imperfections—or unfavorable geometric perturbations—can dramatically reduce the collapse strength of these structures. Due to the inherent instability in their postbuckling response, structural designers traditionally resort to knock-down factors, limiting maximum allowable loads to ensure safety.

However, this conservative approach raises a pertinent design question: Can intentionally introduced favorable geometric perturbations yield shells with more predictable, controllable deformation paths and with less variability in their maximum collapse pressure? For spherical shells, our studies demonstrate that introducing outward-pointing (rather than inward) dimple perturbations can enhance collapse resistance under external pressure, designating these as favorable configurations. In the context of cylindrical shells, the postbuckling reserve capacity known from plate structural mechanics is exploited: polygonal prismatic shells (plate-shells) are proposed and analyzed, combining both plate-like and shell-like characteristics. The results show that these plate-shells exhibit relative insensitivity to geometric imperfections over a range of designs and sustain collapse loads that exceed those of conventional circular cylindrical shells.

These findings represent a significant shift from the commonly reported imperfection sensitivity dominating the collapse behavior of spherical shells under external pressure and axially compressed cylindrical shells. The research suggests a pathway toward designing shell structures with more robust, predictable collapse responses, which could influence future standards and safety margins in engineering practice.

Biography: Anthony M. Waas, Fulton Professor of Aerospace and Mechanical Engineering is the Director of the School of Engineering for Matter, Transport, and Energy (SEMTE) at Arizona State University. SEMTE encompasses the Aerospace, Mechanical, Materials, Bio, and Chemical Engineering programs. His current research robotically manufactured lightweight thin-walled structures—including in-space fabricated structures—computational modeling of composite aerostructures, damage tolerance of composites, affordable textile composites, hydrogen storage for mobility, and data science applications in materials and structural modeling.

Professor Waas served as the Felix Pawlowski Collegiate Chair and Department Chair, Professor of Aerospace Engineering, and Director of the Composite Structures Laboratory at the University of Michigan from 1988 to 2014. In January 2015, he joined the University of Washington as Chair of the Aeronautics Department and the William Boeing Endowed Professor. He is a Fellow of the American Institute of Aeronautics and Astronautics (AIAA), American Society of Mechanical Engineers (ASME), American Society for Composites (ASC), American Academy of Mechanics (AAM), and the Royal Aeronautical Society, UK.

He has received numerous awards including multiple best paper honors, the 2016 AIAA/ASME SDM National Award, the AAM Junior Research National Award, and the ASC Outstanding Researcher International Award. In 2017, he was honored with the AIAA-ASME-ASC James H. Starnes Jr. Award for seminal contributions to composite structures and materials, as well as for mentoring students and young professionals. Professor Waas was elected to the Washington State Academy of Sciences in 2017 and to the European Academy of Sciences and Arts in 2018.

Further distinctions include the AIAA ICME Prize (2020), ASME Warner T. Koiter Medal (2020), the AIAA Dryden Lecture in Research, and membership on the US National Academy of Engineering's Aeronautics and Space Engineering Board since 2021. Most recently, he received the CT Sun Medal from the American Society of Composites in September 2023 and the 2025 ASCE Raymond D. Mindlin Medal recognizing his lifelong contributions to aerospace composite structures.

PLENARY SESSION

Tuesday, June 9
8:00AM–9:00AM
International 3-5
Presentation Title:
Next Generation Structures and Structural Design

Dr. Greg Reich
Director of the Multidisciplinary Science & Technology Center
Air Force Research Laboratory

Abstract: Modern aircraft require unique, highly integrated structures to achieve their desired mission objectives. Multi-scale multi-physics models that capture complex behavior are necessary to correctly predict the performance of these structures in their operating environment. As design complexity goes up, numerical optimization techniques are required to help the designer determine feasible and then more advantageous designs in the design space. This talk will address some of the recent work in the Air Force Research Laboratory in these areas and hopefully motivate future research and innovation by the larger community.

Biography: Dr. Reich is currently the Director of the Multidisciplinary Science & Technology Center (MSTC) in the Aerospace Systems Directorate, Air Force Research Laboratory. He leads a team of government and contract researchers in fundamental and applied research in multi-fidelity design of aircraft systems, focusing on the use of system Measures of Effectiveness as objectives in the multidisciplinary analysis, design, and optimization process.

From 2020 to 2023, he served as the Principal Scientist of the Aerospace Vehicles Division, with responsibility for the overall health and strategic guidance of the division's basic and applied research competencies. From 2016 to 2020, Dr. Reich was Tech Area Lead in MSTC conducting fundamental and applied research in conception, design, system integration, and testing of adaptive structures and multidisciplinary technologies across a range of physical scales.

Dr. Reich is a Fellow of AFRL, AIAA, and ASME. He is Chair of the 2026 Gordon Research Conference on Multifunctional Materials and Structures and previously chaired the SPIE Smart Structures & NDE Conference and the AIAA Adaptive Structures Conference. Dr. Reich is a past Chair of the AIAA Adaptive Structures Technical Committee and served as an Associate Editor of the Journal of Intelligent Material Systems & Structures from 2010 to 2023. He has served on advisory boards for DoD research groups, academic departments and projects, and NASA.

Dr. Reich received a Bachelor's degree from Georgia Tech in 1992, a Master's degree from MIT in 1994, and a Ph.D. from the University of Colorado in 2000, all in Aerospace Engineering.

PLENARY SESSION

Wednesday, June 10
8:00AM–9:00AM
International 3-5
Presentation Title: The Naval Research Laboratory: Science and Engineering for Seapower and the Nation

Dr. Peter Matic
Associate Director of Research
Naval Research Laboratory

Abstract: The Naval Research Laboratory (NRL) is the corporate research laboratory of the U.S. Navy and Marine Corps. Its mission is to conduct a broad-based program of scientific research and advanced technology development that serve as a foundation for delivering new capabilities for national defense. NRL's 1700 scientists and engineers cover a wide range of disciplines pursuing long-term breakthroughs and near-term advances. NRL began its service to the nation in 1923. The 2023 centennial provided a unique opportunity to reflect on the evolution of a complex organization and its contributions. Its inaugural work focused on radio and underwater sound. As science, engineering, and world events evolved over the decades, NRL added new staff and research capabilities in emerging and important areas including materials, chemistry, and electronics. Recent thrusts have been established in biotechnology, nanoscience, autonomy, and quantum science.

This presentation will discuss NRL's organization, staffing and business model; its culture of multidisciplinary research and development; and the importance of collaboration with academia, industry, and government. It will highlight historical points of reference that shaped the laboratory and discuss examples of fundamental research and its impact on technology, the Naval services, and the nation.

Biography: Dr. Peter Matic is the Associate Director of Research for the Materials Science and Component Technology Directorate at the U.S. Naval Research Laboratory (NRL) in Washington, DC. His responsibilities include the technical direction, financial management, and administration of over 500 scientists, engineers, and staff conducting multidisciplinary research and technology development. The Directorate's work covers materials, chemistry, biomolecular sciences, plasma and laser physics, electronics, and fluid dynamics for the Navy, the Marine Corps, and other government agencies. He is also the Materials and Chemistry Focus Area Coordinator for the NRL Base Research Program.

He has led or conducted work on the biomechanics of blast and impact; body armor and infantry combat equipment; deformation, damage and fracture of materials and structures; mathematical and computational strategies to model complex materials and systems; integrated use of experimental data and computational simulations; multifunctional structure-energy composite materials and components; and submarine and surface ship structural integrity.

He received a B.S. in Mechanical Engineering from Illinois Institute of Technology and a Ph.D. in Applied Mechanics from Lehigh University. Early in his career, he worked at the Electric Boat Division of the General Dynamics Corporation. He has also taught undergraduate and graduate courses at George Washington University.

PANEL

Tuesday June 9th | 2pm – 4pm | Pacific 1

Panel Title: Understanding and Benchmarking Transverse Shear Stiffness Calculations Across FEM Solvers

Moderator: Zhenning Hu, Technical Fellow, Boeing

Panelists:
Wenbin Yu, Purdue University
Tony Waas, Arizona State University
Erasmo Carrera, Politecnico di Torino
Luciano Demasi, San Diego State University
Wenjie Xie/Ali Najafi, ANSYS
Olaf Weckner, Boeing
Rachel Lee, Boeing

Description: When calculating the deformation and stress of composite structures, Classical Laminate Plate Theory unambiguously defines the in-plane stiffness, bending stiffness and coupling stiffness of the shell element (e.g., Abaqus' S4 element and Nastran's QUAD4 element). However, there is no consensus on how to calculate transverse shear stiffness in academia and industry. Various shear correction factors are proposed in the literature for metals. For composites, the disagreement is even larger.

Even though transverse shear is typically a second order / small effect for solid laminates, the effect could become larger depending on the loading, geometry and material. It particularly causes frustration when smeared property, a common approach in industry, is applied to analyze thick composite structures.

The objective of this technical panel is to find a way to standardize the calculation of transverse shear stiffness. It will start with the background description and findings of discrepancies among various commercial analysis solvers. The panelists will share and discuss their perspective on latest theories, research and benchmark tests. After discussion, the panel moderator and panelists will down select the most promising theories and provide a list of recommendations for verification and validation. The benchmark plan could include a list of composite structures (layups), published test data, finite element models, etc.

SSDM 2026 TRACK KEYNOTES

STRUCTURES KEYNOTE

Monday, June 8
9:15AM–10:15AM
International 1
Presentation Title: Engineering: Art or Science?

Agnes Blom-Schieber
Technical Fellow, Boeing

Abstract: Practicing structural engineering without digital tools is now nearly unthinkable—from analysis and optimization to documentation and collaboration. With the rapid emergence of Artificial Intelligence and Machine Learning, our tools are becoming more capable, faster, and sometimes less transparent, reshaping how we generate solutions and how we justify them. In this keynote, she will share a few experiences where engineering decisions—especially modeling choices, assumptions, and gaps in good practice affected outcomes. These examples illuminate why engineering is neither purely art nor purely science: ultimately, engineering is the art of doing the right science and of doing the science right. She will close with a practical perspective on how AI/ML can support that balance, and what habits and safeguards we need as the engineering workflow evolves.

Biography: Agnes holds a B.Sc., M.Sc., and Ph.D. in Aerospace Engineering from Delft University of Technology in the Netherlands. She is a Technical Fellow in Mechanical and Structural Engineering at the Boeing Company. She is an expert in the design, analysis, and manufacturing of composite structures. Her current focus is on design for manufacturability, model-based engineering, multi-disciplinary analysis, and optimization; and AI/machine learning. She is also a Structures focal for thermoplastic primary structure. She is an Affiliate Professor at the University of Washington Mechanical Engineering department. Previous to joining Boeing, Agnes worked in the R&D department at Fokker Aerostructures. Agnes is an AIAA Associate Fellow, and she has been a member of the technical advisory board of the ThermoPlastic composite Research Center (TPRC) since 2011. Agnes holds 38 U.S. patents and 10 Boeing trade secrets.

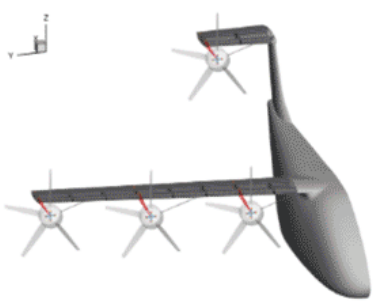
STRUCTURAL DYNAMICS KEYNOTE

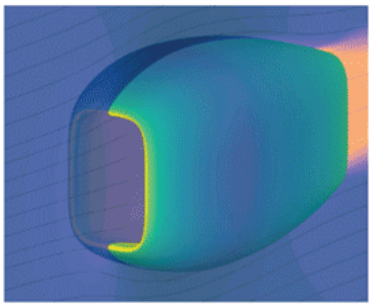
Tuesday, June 9
9:15AM–10:15 AM
International 1
Presentation Title: Shaping Next-Generation Aircraft with Multidisciplinary Design Optimization

Joaquim R.R.A. Martins
University of Michigan

Abstract: Air transportation's quest for efficiency requires groundbreaking advancements in aircraft design, particularly in the optimization of aircraft configurations, including aerodynamic shape, structural sizing, and propulsive performance. This talk will examine the latest developments in computational fluid dynamics (CFD)-based design optimization, addressing the critical challenges and innovative solutions in shaping aircraft components for enhanced efficiency and reduced emissions. We will explore the integration of CFD with structural mechanics to optimize wing aerodynamics, enhance lift-to-drag ratio, and reduce structural weight. The discussion will extend to the aerodynamic optimization of propellers and turbofans, highlighting how CFD facilitates the design of propulsion systems that integrate optimally with the airframe. By employing multidisciplinary optimization (MDO) approaches, we have advanced the design of these key aircraft components, considering complex interactions and design constraints. We will focus on the adjoint method for efficient gradient computation, which is essential for handling the large number of shape and sizing variables required in aircraft design. The talk will present case studies demonstrating the successful application of these methods in optimizing aircraft wings, along with innovative designs of propellers and turbofans. Finally, we will discuss our vision for using MDO to shape the future of sustainable aviation.

Biography: Joaquim R.R.A. Martins is the Pauline M. Sherman Collegiate Professor of Aerospace Engineering at the University of Michigan, where he heads the Multidisciplinary Design Optimization Laboratory. His research group develops MDO methods and applies them to the design of air and marine vehicles, as well as other engineering systems. He is a co-author of Engineering Design Optimization, a textbook published by Cambridge University Press. Prof. Martins is a Fellow of the American Institute of Aeronautics and Astronautics and a Fellow of the Royal Aeronautical Society. Before joining the University of Michigan faculty in 2009, he was an Associate Professor at the University of Toronto Institute for Aerospace Studies. From 2002, he held a Tier II Canada Research Chair in Multidisciplinary Optimization. He received his undergraduate degree in Aeronautical Engineering from Imperial College, London, with a British Aerospace Award. He obtained his M.Sc. and Ph.D. degrees from Stanford University, where he was awarded the Ballhaus prize for best thesis in the Department of Aeronautics and Astronautics. He has received the Best Paper Award at AIAA Conferences six times. He has served as Associate Editor for the AIAA Journal, Optimization and Engineering, and Structural and Multidisciplinary Optimization. He is currently an Associate Editor for the Journal of Aircraft.





MATERIALS KEYNOTE

Wednesday, June 10
9:15AM–10:15AM
International 1
Presentation Title: Atomistic Simulation of Damage in Carbon-Carbon Composites from Impact with Water Droplets at Hypersonic Velocity

Dr. Samit Roy
The University of Alabama

Abstract: Carbon-carbon (C-C) composites used in hypersonic airframes experience extreme thermomechanical stresses and environmental conditions that can lead to physical and chemical erosion of the material. The leading-edge of a hypersonic airframe may undergo erosion due to extreme aerodynamic heating and entrained moisture in the boundary layer. Such leading-edge erosion could adversely affect the accuracy of the terminal guidance to target of a hypersonic weapon. This study employs reactive molecular dynamics (RMD) to simulate the impact of water droplets on a novel C-C composite at hypersonic velocity transiting through a shockwave prior to impact. The composite consists of simulated carbon fibers embedded within a glassy carbon matrix derived from the pyrolysis of polyfurfuryl alcohol (PFA), modeled using ReaxFF potential. The polymerization and pyrolysis processes are precisely modeled using RMD simulations, closely matching experimental findings. To emulate the realistic flight environment, the simulation incorporates a preformed air shock-wave layer through which the water droplet travels before striking the heated composite surface at hypersonic velocity results in material degradation due to impact as well as chemical ablation due to high-temperature (2500 K) oxidation. This approach enables the evaluation of mechanical damage as well as chemical degradation in C-C composites, an aspect often neglected in purely mechanical simulations like finite element analysis or peridynamics. Figure 1 shows the RMD predicted damage on a simulated C-C composite due to water droplet impact normal to the surface and oblique to the surface. As shown in the figure, the depth of the crater due to oblique impact is less severe than the direct impact case. Furthermore, the flattening of the water droplet while transiting through the shockwave region prior to impact on the C-C composite results in less severe cratering. The insights gained here are critical for advancing predictive models of erosion on C-C composites and guiding the design of next-generation thermal protection materials for hypersonic aerospace applications.

Biography: Dr. Samit Roy received his Ph.D. in Engineering Science & Mechanics from Virginia Tech in Blacksburg, Virginia. He is currently the William D. Jordan Endowed Professor in the Department of Aerospace Engineering and Mechanics at University of Alabama (UA). Dr. Roy's research interest is directed toward multi-scale modeling and life-prediction of fiber reinforced polymer composites and structural adhesives subjected to aggressive environmental conditions. He is also actively involved in the application of nanostructured reinforcements in enhancing performance of composite materials and was awarded a patent for this work in 2023. He has developed structural health management concepts that include sensor placement optimization for structural weight and cost reduction, as well as smart materials for intelligent self-healing. This research has attracted keen interest from the U.S. Air Force and NASA, and he has filed for a provisional patent related to this work. He has authored over 200 peer-reviewed journal articles and book chapters and has monitored more than 25 graduate students at UA. He was elected Associate Fellow of the American Institute of Aeronautics and Astronautics in 2004, elected Fellow of ASME in 2010, and Fellow of American Society for Composites in 2022. He was elected Chairman of the ASME NanoEngineering for Energy and Sustainability steering committee in 2014 and is the current Division Chair, Emerging Composite Technologies Technical Division, of the American Society for Composites since 2022. He is the recipient of the ASC Outstanding Researcher Award in Composites in 2019 and again in 2023.

SSDM 2026 AWARDS

Tuesday, June 9 | 11:45AM–1:45PM | International 3-5

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.

Azad Madni, Ph.D.
University Professor
University of Southern California

Achievement: Pioneering contributions to model-based performance assessment of NASA Space Shuttle Navigation Filters, pivotal work in AI-Based planning and decision aiding of fighter aircraft aircrew, and visionary transformation and leadership in aerospace systems engineering education.

Biography: As lead GN&C engineer at Rockwell International on NASA's Space Shuttle Program, he made key contributions to the shuttle navigation performance analysis and Kalman filter design: a) a cost-effective probabilistic model-based testing approach to verify navigation system performance; b) stochastic models of external navigation aids for use in navigation filter; c) Kalman filter trade studies for navigation system; and d) evaluation of IMU redundancy management techniques. For these innovations, he received the IEEE AESS Judith A. Resnik Space Award.
As EVP for R&D and CTO of Perceptronics, he pioneered AI advances for fighter aircraft tactical decision aiding on Navy-, DARPA-, and Northrop-sponsored research. His tactical decision aid was adopted by the Navy to teach F-14 aircrew air intercept operations. For these innovations, he received the IEEE AESS Pioneer Award.
As founder and Chief Technologist of Intelligent Systems Technology, Inc., he transformed system modeling from an open-loop deterministic approach into a storytelling-enabled closed-loop learning approach. For this innovation, he received the INCOSE Pioneer Award and IEEE AESS Industrial Innovation Award.

Present Responsibilities: As University Professor (highest academic rank), and Executive Director of USC's Systems Architecting and Engineering aerospace program, he transformed the educational paradigm to become transdisciplinary. Currently expanding engineering to embrace concepts from AI, cognitive psychology, digital twinning and physics. For these successful innovations, he received the NAE's Gordon Prize and the IEEE Simon Ramo Medal.

DEDICATED SERVICE AWARD

In 1983, the ASME Board of Governors approved the establishment of the ASME Dedicated Service Award (DSA). It honors unusual dedicated voluntary service to the Society marked by outstanding performance, demonstrated effective leadership, and prolonged and committed service, devotion, enthusiasm, and faithfulness. The award may be presented to selected individuals who have served the Society for at least ten years in one or more of the following areas: Standards and Certification; Public Affairs & Outreach; Section Engagement; Technical & Engineering Communities; Student & Early Career Development; Board of Governors; ASME Foundation; and The ASME Auxiliary, Inc.

Erkan Oterkus
Faculty Member
Stony Brook University

Achievement: Professor Oterkus has provided exceptional leadership and service to ASME for 10+ years. He has made significant contributions to ASME activities as the General Chair of ASME SSDM Conference, ASME Europe Region Leader, and Member of ASME Section Engagement Council.

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. As a professional in industry, each recipient will have significantly contributed to aeronautics and astronautics, and the engineering community at large. Awardees will have demonstrated originality, forward-thinking, and a thirst for innovation. The recipient will have helped to revolutionize the industry and open the door for greater progress in the field.

Fuh-Gwo Yuan
Samuel P. Langley Distinguished Professor
NC State University

Achievement: Innovative computer vision and machine learning techniques for imaging barely-visible impact damage in composite structures in support of certification for structural health monitoring of aerospace structures.

Biography: Professor Yuan received his B.S. in Engineering Science, National Cheng Kung University, Taiwan. After receiving M.S. and Ph.D. from Department of Theoretical and Applied Mechanics, University of Illinois at Urbana-Champaign, Dr. Yuan has been teaching at Department of Mechanical and Aerospace Engineering, North Carolina State University, Raleigh, NC. He worked at Boeing Co. and the Air Force Research Laboratory. Since 2011, he has served as a Samuel P. Langley Distinguished Professor at National Institute of Aerospace (NIA), Hampton, Virginia. Prof. Yuan spent half of his career working at NASA Langley Research Center in the design and optimization of lightweight aerospace vehicles such as Boeing or Airbus commercial planes.

His research interests related to aerospace and defense industries include structural health monitoring/management, nondestructive evaluation, artificial intelligence or machine learning, multi-functional materials and composite structures design, nano-/mesoscale sensors, advanced computing tools with smart sensors, damage prognosis, and energy harvesting. He has authored or co-authored close to 400 publications and has mentored over 100 individuals ranging from Ph.D. students to visiting scholars.

Prof. Yuan's transformative innovations in structural health monitoring (SHM) have been recognized through many national and international honors and awards. Recently, he received the 2025 Life Achievement Award in SHM and the 2023 Lifetime Achievement Award in Nondestructive Evaluation from the International Society for Optics and Photonics (SPIE). In this SHM community, Yuan was also awarded the 2023 SHM Hans-Juergen Schmidt Award and the 2013 SHM Person of the Year Award. In 2023, he received R.J. Reynolds Tobacco Company Award, College of Engineering, North Carolina State University.

In addition to his research accomplishments, Yuan is a gifted educator beloved by all those he has advised over the years and his students have even spanned generations. He has had a father and son who both received their Ph.D. degrees under his advisory. Also, there is a family whose three brothers have all worked with him to earn the Ph.D. His dedication to training and advising many students who became civil servants at LaRC earned him a NASA Mentoring Award in 2018.

Prof. Yuan is a Fellow of three professional societies: the American Society of Mechanical Engineers, SPIE, and Royal Aeronautical Society. He serves as Manager Editor of the International Journal of Sustainable Materials and Structural Systems as well as serves as an Associated Editor of two journals and five Editorial Boards.

ASME/BOEING STRUCTURES AND MATERIALS AWARD

The ASME Aerospace Division Structures and Materials Technical Committee has reviewed the papers published at the 2025 ASME Aerospace Structures, Structural Dynamics, Materials Conference. On the basis of originality and significance to the field, the paper titled "Probabilistic Physics-Guided Machine Learning with Missing Data: Applications in Additive Manufacturing," has been identified as the winner of the Boeing Structures and Materials Award.

Congratulations to the Authors:
Jie Chen, Department of Mechanical Engineering, Virginia Tech, Blacksburg, VA; and Yongming Liu, School for Engineering of Matter, Transport and Energy, Arizona State University, Tempe, AZ

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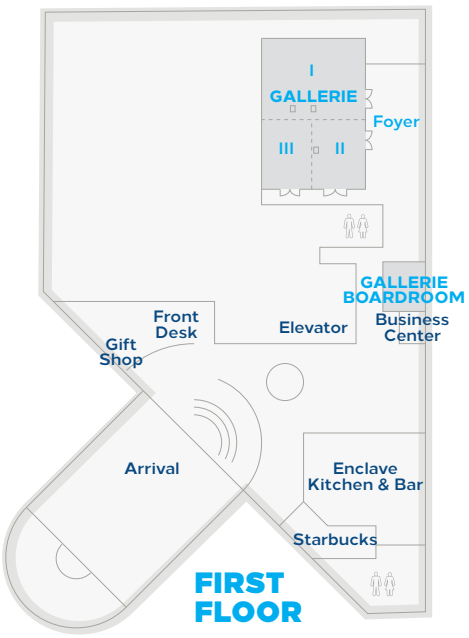

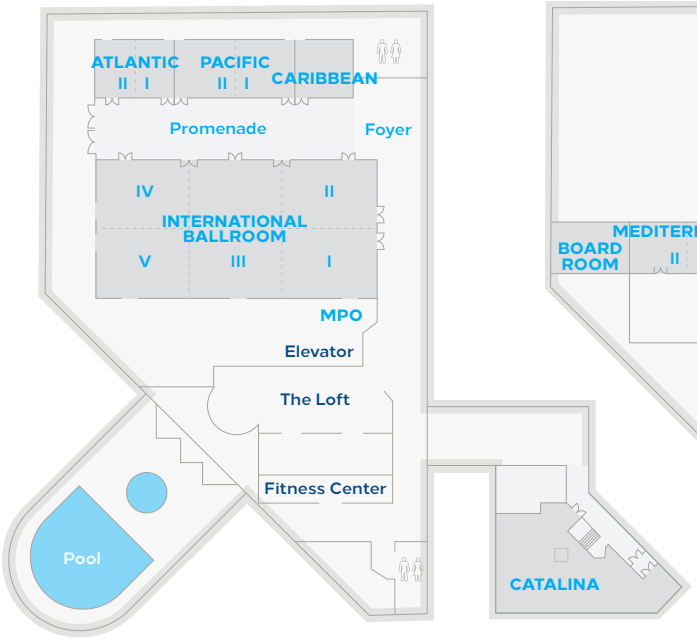

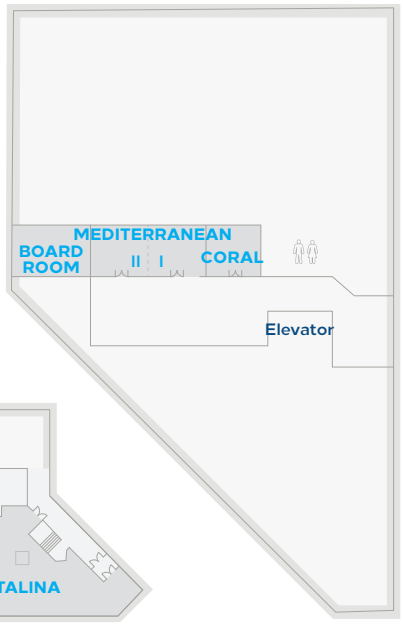

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