AIAA SciTech 2025 Structures Technical Committee

AIAA SciTech 2025 January 6-10, 2025 Orlando, FL

The Structures Technical Discipline covers any aircraft and/or spacecraft (e.g., launch vehicles) related science and technology in design, analysis, computer modeling, optimization, manufacturing, and testing. Its topics include the latest development in both traditional structures and innovative concepts, ranging from coupons and components to vehicles and comprising metallic, composite, and/or hybrid materials. It also covers refinement, improvement and development of current approaches, and exploration in structural repair, damage, fatigue, fracture, stability, and manufacturing. Papers on advancements in durability, damage tolerance, aging, fail-safe and/or safe life are also encouraged. We welcome papers on best practices, historical lessons learned, and advances in structural applications. Papers on other topics in structures not explicitly mentioned above are also strongly encouraged.

AIAA Structures Technical Discipline at SciTech 2025 will include joint sessions in 3D Woven Composite Materials and Structures, AI/ML in Structures and Materials, Fatigue Loads and Spectrum Generation, In-Space Servicing, Assembly and Manufacturing (ISAM), Integrated Computational Materials Engineering (ICME), Multifunctional Air and Space Structures, Structural Joints and Repairs, Structural Optimization Application for Air and Space, Structures and Materials in Extreme Environments, and Thermoplastic Composites.

The Structures Technical Discipline at SciTech 2025 will include special sessions in Additive Structures, Crashworthiness of eVTOL/UAM Vehicles, Stitched Composite Structures, and Structural Health Monitoring & Non-Destructive Evaluation. There will also be Special Sessions in Memory of Dr. Frank Abdi.

We invite you to submit a paper for the AIAA Structures Technical Discipline at SciTech 2025. The major deadlines are as follows:

Extended abstracts of no less than 1,000 words are due May 23, 2024 Author notification of paper acceptance on or about August 26, 2024 Final manuscript due December 2, 2024

For more information, contact the AIAA Technical Discipline Chair for SciTech 2025:

Philip Knoth Air Force Research Laboratory philip.knoth@us.af.mil (937) 656-8819 Examples of session topics are listed below; however, this list is not exclusive. Other topics in structures not explicitly listed below are also welcomed.

Traditional Session Topics:

Typical sessions over the last 5 years:

- Air and Space Structural Design, Analysis, Test
- Buckling and Stability of Air and Space Structures
- Composite Structural Analysis, Design, Testing, and Manufacturing
- Fatigue, Fracture, and Impact Damage of Structures
- Other Topics in Structures

Joint Sessions with other TCs:

- 3D Woven Composite Materials and Structures
- AI/ML in Structures and Materials
- Fatigue Loads and Spectrum Generation
- In-Space Servicing, Assembly and Manufacturing (ISAM)
- Integrated Computational Materials Engineering (ICME)
- Multifunctional Air and Space Structures
- Structural Joints and Repairs
- Structural Optimization Application for Air and Space
- Structures and Materials in Extreme Environments
- Thermoplastic Composites

Special Sessions for SciTech 2025:

- Additive Structures
- Crashworthiness of eVTOL/UAM Vehicles
- Stitched Composite Structures
- Structural Health Monitoring & Non-Destructive Evaluation

"In Honor/Memory of" Sessions:

• Special Session in Memory of Dr. Frank Adbi

Other Topics in Structures:

This list of session topics is not exclusive. Papers on other topics in structures are strongly encouraged. Additional information on joint special sessions is attached.

The AIAA Structures Technical Committee is sponsoring a Session on

Air and Space Structural Design, Analysis, Test

AIAA SciTech 2025

January 6-10, 2025 Orlando, FL

The AIAA (American Institute of Aeronautics and Astronautics) Structures Committee solicits papers with recent research, technological advancements, and systems-level perspectives in **Air and Space Structural Design**, **Analysis**, **Test** within the AIAA SciTech conference. The topic covers a wide range of topics related to the advancement of aircraft and spacecraft structures by disseminating theoretical, experimental, and computational techniques. Typical, but not limited to, topics could include:

- Analysis of structural design, analysis, and experimentation for improving or predict strength, stiffness, dynamic modes, fatigue, flutter, crash/impact tolerance, etc.
- New design concepts to reduce weight-to-strength ratios.
- Computational techniques mapping multiscale analysis.

The committee welcomes submissions from government, industry, academic, and small businesses. All abstracts are peer-reviewed.

Extended abstracts of no less than 1,000 words are due May 23, 2024 Author notification of paper acceptance on or about August 26, 2024 Final manuscript due December 2, 2024

Detailed deadline information, abstract preparation instructions, and policies can be found at: <u>https://www.aiaa.org/SciTech/call-for-content/call-for-papers</u>

Make sure to select "Air and Space Structural Design, Analysis, Test" topic option under "Structures" technical discipline when prompted during submission.

For more information, contact one of the following organizers:

Jeff Chambers	Aurora Flight Sciences	<u>ch</u>
Pu Wang	The Boeing Company	քւ

chambers.jeffrey@aurora.aero pu.wang3@boeing.com

The AIAA Structures Technical Committee is sponsoring a Session on

Buckling and Stability of Air and Space Structures

AIAA SciTech 2025

January 6-10, 2025 Orlando, FL

The AIAA (American Institute of Aeronautics and Astronautics) Structures Committee solicits papers with recent research, technological advancements, and systems-level perspectives on Buckling and Stability of Air and Space Structures within the AIAA SciTech conference. Aerospace structures, including aircraft, launch vehicles, and space satellites, are lightweight structures, aimed at carrying the flight loads efficiently. Under compression, shear, or other forces, these structures are subject to buckling, which changes their load-carrying capability. These structures can be built from basic components, like beams (columns), plates, shells (cylindrical, conical, spherical), and panels. Other advanced components would include stiffened panels and stiffened shells that have increased load-carrying capacity with a relatively low addition of mass. While plates have stable post-buckling behavior, shells generally have unstable post-buckling behavior, often with a relatively large difference between the calculated and experimental buckling loads. Aerospace structures, laminated composite and/or sandwich-based structures, can add complexity to the solution. The proposed topic addresses a broad range of topics: (i) analytical and computational stability of aerospace structures, (ii) experimental results and procedures to increase the accuracy of the predicted buckling loads, (iii) numerical and experimental results of composite structures, (iv) stability of lightweight structures in the presence of cutouts; and (v) behavior of aerospace structures under combined loadings. Any other related topics will also be most welcomed.

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Make sure to select "Buckling and Stability of Air and Space Structures" topic option under "Structures" technical discipline when prompted during submission.

Prof. Chiara Bisagni	Politecnico di Milano	<u>chiara.bisagni@polimi.it</u>
Vijay Goyal	Lockheed Martin Aeronautics	vijay.k.goyal@lmco.com

The AIAA Structures Technical Committee is sponsoring a Session on

Composite Structural Analysis, Design, Testing, and Manufacturing

AIAA SciTech 2025

January 6-10, 2025 Orlando, FL

The AIAA (American Institute of Aeronautics and Astronautics) Structures Committee solicits papers with recent research, technological advancements, and systems-level perspectives on Composite Structural Analysis, Design, Testing and Manufacturing within the AIAA SciTech conference. This session is focused on traditional and new design concepts, disseminated through analysis, testing, and manufacturing. Looking for original research papers, review articles, case studies from a broad aspect of the science and technology of composite materials, including fibrous and particulate reinforcements in polymeric, metallic and ceramic matrices, and other composites. Typical, but not limited to, topics could include the properties, design and manufacture of reinforcing fibers and particles, novel architectures and concepts, multifunctional composites, advances in fabrication and processing of composite materials and structures, computational, experimental mechanics, interfaces in composites, new approaches to prediction and measurement of mechanical, physical behavior, and performance of composites in service. Applications to all aero-structures, aircraft and spacecraft (such as launch vehicles), are welcome.

The committee welcomes submissions from government, industry, academic, and small businesses. All abstracts are peer-reviewed.

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Make sure to select "Composite Structural Analysis, Design, Testing, and Manufacturing" topic option under "Structures" technical discipline when prompted during submission.

Jeff Chambers	Aurora Flight Sciences	chambers.jeffrey@aurora.aero
Wei Zhao	Oklahoma State University	wzhao@okstate.edu

The AIAA Structures Technical Committee is sponsoring a Session on

Fatigue, Fracture, and Impact Damage of Structures

AIAA SciTech 2025

January 6-10, 2025 Orlando, FL

The AIAA (American Institute of Aeronautics and Astronautics) Structures Committee solicits papers with recent research, technological advancements, and systems-level perspectives on Fatigue, Fracture, and Impact Damage of Structures within the AIAA SciTech conference. This session focuses on the broad topic of structural integrity that is concerned with the reliability and effectiveness of various materials and structural components of any scale or geometry. Damage could also include damage tolerance, fail-safe, or safe-life approaches. Typical, but not limited to, topics include: novel testing and characterization methods, multiaxial and complex loading effects of materials and structures, computational and experimental techniques, models for early stages of crack formation and growth, prognosis and damage state awareness, applications of technologies associated with fatigue and their implications for structural integrity and reliability, fatigue of devices and structures at small scales, including effects of process route and surfaces/interfaces, and thermal effect. Applications to all aero-structures, aircraft and spacecraft (such as launch vehicles), are welcome.

The committee welcomes submissions from government, industry, academic, and small businesses. All abstracts are peer-reviewed.

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Detailed deadline information, abstract preparation instructions, and policies can be found at: <u>https://www.aiaa.org/SciTech/call-for-content/call-for-papers</u>

Make sure to select "Fatigue, Fracture, and Impact Damage of Structures" topic option under "Structures" technical discipline when prompted during submission.

For more information, contact one of the following organizers:

Vijay Goyal	Lockheed Martin Aeronautics
James Min	NASA Glenn Research Center

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The AIAA Structures Technical Committee and the Materials Technical Committee are sponsoring a Joint Session on

3D Woven Composite Materials and Structures

AIAA SciTech 2025

January 6-10, 2025 Orlando, FL

The AIAA (American Institute of Aeronautics and Astronautics) Structures and the Materials Technical Committees solicits papers with recent research, technological advancements, and systems-level perspectives on **3D Woven Composites for Materials and Structures** within the AIAA SciTech conference. It is the intention to examine advances relevant to aerospace materials and structures including:

- Design, analysis, and characterization of 3D woven materials and structures
- Novel manufacturing techniques for 3D woven preforms and composite structures
- New analysis methods for 3D woven material and structural design and evaluation
- Imaging and microstructural evaluation of 3D woven materials and structures
- Novel observations of material and structural response characteristics resulting from mechanical and/or thermal loading
- Process modeling of 3D woven materials and structural components, including weaving, compaction, infusion, and/or cure of 3D woven preforms
- Integration of process and performance predictions of 3D woven composites
- Qualification/certification approaches and challenges for 3D woven materials and structures

The committee welcomes submissions from government, industry, academic, and small businesses. All abstracts are peer-reviewed.

Extended abstracts of no less than 1,000 words are due **May 23, 2024** Author notification of paper acceptance on or about **August 26, 2024** Final manuscript due **December 2, 2024**

Detailed deadline information, abstract preparation instructions, and policies can be found at: https://www.aiaa.org/SciTech/call-for-content/call-for-papers

Make sure to select the "3D Woven Composite Materials and Structures" topic option under "Materials" or "Structures" technical discipline when prompted during submission.

Prof. Hülya Cebeci	İstanbul Technical University	hulya.cebeci@itu.edu.tr
Prof. Dianyun Zhang	Purdue University	dianyun@purdue.edu

The AIAA Structures Technical Committee and the Materials Technical Committee are sponsoring a Joint Session on

AI/ML for Materials and Structures

AIAA SciTech 2025

January 6-10, 2025 Orlando, FL

The AIAA (American Institute of Aeronautics and Astronautics) Structures and Materials Technical Committees solicit papers with recent research, technological advancements, and systems-level perspectives in Artificial Intelligence and Machine Learning for Problems in Structures and Materials within the AIAA SciTech conference. Artificial Intelligence and machine learning (deep learning included) technologies offer the potential to revolutionize and streamline current processes to develop and qualify materials and improve our design process for aerospace structures. These sessions will examine applications of various artificial intelligence and machine learning technologies to develop new material further and structural applications and their application to design and qualification/certification. Applications to all aero-structures, aircraft and spacecraft (such as launch vehicles), are welcome.

The committee welcomes submissions from government, industry, academic, and small businesses. All abstracts are peer-reviewed.

Extended abstracts of no less than 1,000 words are due May 23, 2024 Author notification of paper acceptance on or about August 26, 2024 Final manuscript due December 2, 2024

Detailed deadline information, abstract preparation instructions, and policies can be found at: <u>https://www.aiaa.org/SciTech/call-for-content/call-for-papers</u>

Make sure to select the "AI/ML for Materials and Structures" topic option under "Materials" or "Structures" technical discipline when prompted during submission.

For more information, contact one of the following organizers:

Yumeng Li Steven Wanthal Brandon Hearley Pu Wang University of Illinois The Boeing Company NASA Glenn Research Center The Boeing Company yumengl@illinois.edu steven.wanthal@boeing.com brandon.l.hearley@nasa.gov pu.wang3@boeing.com

The AIAA Structures Technical Committee and Structural Dynamics Technical Committee are sponsoring a Joint Session on

Fatigue Loads and Spectrum Generation

AIAA SciTech 2025

January 6-10, 2025 Orlando, FL

The AIAA (American Institute of Aeronautics and Astronautics) Structures Technical and Structural Dynamics Technical Committees solicits papers with recent research, technological advancements, and systems-level perspectives on Fatigue Loads and Spectrum Generation for the AIAA SciTech conference. Applications to all aero-structures, aircraft and spacecraft (such as launch vehicles), are welcome. Potential topics could include but are not limited to:

- Air load determination (statistical, discrete nz, measured strains and loads for gust and maneuver abrupt and balanced)
- Ground handling load determination (landing impact, taxi., thrust reverse events)
- Spectrum generation (load generation, handling load-to-stress conversion, spectrum event load time history representation)
- Test spectra (analytic loads, clipping and truncating of spectra)

The committee welcomes submissions from government, industry, academic, and small businesses. All abstracts are peer-reviewed.

Extended abstracts of no less than 1,000 words are due May 23, 2024 Author notification of paper acceptance on or about August 26, 2024 Final manuscript due December 2, 2024

Detailed deadline information, abstract preparation instructions, and policies can be found at: <u>https://www.aiaa.org/SciTech/call-for-content/call-for-papers</u>

Make sure to select the "Fatigue Loads and Spectrum Generation" topic option under "Structures" or "Structural Dynamics" technical discipline when prompted during submission.

For more information, contact one of the following organizers:

Rich Manwell Darin Haudrich Textron Aviation The Boeing Company rmanwell@txtav.com darin.p.haudrich@boeing.com

The AIAA Structures Technical Committee and Spacecraft Structures Technical Committee are sponsoring a Joint Session on

In-Space Servicing, Assembly and Manufacturing (ISAM)

AIAA SciTech 2025

January 6-10, 2025 Orlando, FL

The AIAA (American Institute of Aeronautics and Astronautics) Structures Committee, Spacecraft Structures Committee and TBD Committee are soliciting papers with recent research, technological advancements, and systems-level perspectives on **In-Space Servicing**, Assembly and Manufacturing (ISAM). This includes the full-range of ISAM developments including:

- Servicing
- Orbital refueling
- Mission life extension
- Orbital debris removal
- In-situ resource utilization
- In-space joining operations
- Orbital assembly technology
- In-space additive manufacturing
- In-space inspection technologies
- Architecting an ISAM ecosystem
- Rendezvous, proximity and docking operations

- Orbital manufacturing of spacecraft components
- Manufacturing on the Lunar and Martian surfaces
- In-space manufacturing of items for terrestrial use
- Development of automated technologies to enable ISAM
- Economic and business case assessments of the future ISAM enterprise
- Space robotics for applications such as docking, manufacturing, assembly, and inspection

The committee welcomes submissions from government, industry, academic, and small businesses. All abstracts are peer-reviewed.

Extended abstracts of no less than 1,000 words are due May 23, 2024 Author notification of paper acceptance on or about August 26, 2024 Final manuscript due December 2, 2024

Detailed deadline information, abstract preparation instructions, and policies can be found at: <u>https://www.aiaa.org/SciTech/call-for-content/call-for-papers</u>

Make sure to select the "In-Space Servicing, Assembly and Manufacturing (ISAM)" topic option under "Structures" or "Spacecraft Structures" technical discipline when prompted during submission.

Jacob Rome	Aerospace Corporation	jacob.rome@aero.org
Francisco Lopez Jimenez	University of Colorado	francisco.lopezjimenez@colorado.edu

The AIAA Structures, Multidisciplinary Design Optimization, and Materials Technical Committees are sponsoring a Joint Session on

Integrated Computational Materials Engineering (ICME)

AIAA SciTech 2025

January 6-10, 2025 Orlando, FL

This session will focus on technology advances in **Integrated Computational Materials Engineering (ICME)** and its applications in air and space structures.

Topics of interest include but are not limited to:

- Multiscale modeling and simulation techniques
- Material characterization and property prediction
- Integrated Process-Performance modeling and optimization
- Data management & process integration for ICME projects
- Design methodologies enabled by ICME
- Data-driven approaches and machine learning in ICME
- Validation and verification of ICME models
- Applications of ICME in air and space structures

The committee welcomes submissions from government, industry, academic, and small businesses. All abstracts are peer-reviewed.

Extended abstracts of no less than 1,000 words are due May 23, 2024 Author notification of paper acceptance on or about August 26, 2024 Final manuscript due December 2, 2024

Detailed deadline information, abstract preparation instructions, and policies can be found at: <u>https://www.aiaa.org/SciTech/call-for-content/call-for-papers</u>

Make sure to select the "Integrated Computational Materials Engineering (ICME)" topic option under "Structures", "Multidisciplinary Design Optimization", or "Materials" technical discipline when prompted during submission.

For more information, contact one of the following organizers:

Ali Najafi Kai James Steven M. Arnold

ANSYS Georgia Tech NASA Glenn Research Center ali.najafi@ansys.com kai.james@gatech.edu steven.m.arnold@nasa.gov

The AIAA Structures, Aircraft Design, and Design Engineering Technical Committees are sponsoring a Joint Session on

Multifunctional Air and Space Structures

AIAA SciTech 2025

January 6-10, 2025 Orlando, FL

The AIAA (American Institute of Aeronautics and Astronautics) Structures Technical Committee Multifunctional Structures Subcommittee is very pleased to announce a call for papers to be presented in sessions on Multifunctional Air and Space Structures within the AIAA SciTech conference. These sessions will examine advances in materials, components, or systems that are designed to perform multiple functions beyond their traditional structural role. These structures integrate functionalities such as sensing, actuation, energy harvesting, and adaptive capabilities, along with their primary load-bearing function. The goal is to enhance the overall performance, efficiency, and versatility of aerospace systems. Here are some key aspects of multifunctional structures in the aerospace context: multifunctional structures maintain their primary role of providing structural support and integrity within an aircraft or spacecraft. They are designed to withstand mechanical loads, vibrations, and other stresses associated with aerospace applications; these structures often incorporate sensors and monitoring systems to assess and report on the structural health of the aircraft, including detecting structural damage, monitoring stress levels, and providing real-time feedback to operators; multifunctional materials, allowing them to change their characteristics in response to external stimuli or enhance the overall efficiency of the aerospace system; multifunctional structures designed to capture and convert ambient energy, such as vibrations or thermal gradients, into usable electrical power, enabling them to contribute to the overall energy efficiency of aircraft and spacecraft; these structures integrate multiple functions into a single structure, enabling weight and space savings; and the use of smart materials, such as piezoelectric materials, shape memory alloys, and others, allow for active control and actuation within the structure. Any structures-related aspect of multifunctional air and space structures that is relevant to aerospace is acceptable for papers.

The committee welcomes submissions from government, industry, academic, and small businesses. All abstracts are peer-reviewed.

Extended abstracts of no less than 1,000 words are due May 23, 2024 Author notification of paper acceptance on or about August 26, 2024 Final manuscript due December 2, 2024

Detailed deadline information, abstract preparation instructions, and policies can be found at: https://www.aiaa.org/SciTech/call-for-content/call-for-papers

Make sure to select the "Multifunctional Air and Space Structures" topic option under "Structures", "Aircraft Design", or "Design Engineering" technical discipline when prompted during submission.

For more information, contact one of the following organizers:

NASA Glenn Research Center	james.
NASA Langley Research Center	andrew
University of Kansas	earnol
Clarkson University	mmart
	NASA Glenn Research Center NASA Langley Research Center University of Kansas Clarkson University

james.b.min@nasa.gov andrew.e.lovejoy@nasa.gov earnold@ku.edu mmartine@clarkson.edu

The AIAA Structures Technical Committee and Materials Technical Committee are sponsoring a Joint Session on

Structural Joints and Repairs

AIAA SciTech 2025

January 6-10, 2025 Orlando, FL

This session will focus on technology advances in the areas of design, analysis, manufacturing, inspection, testing, and performance evaluation of Structural Joints and Repairs for aerospace vehicles. Structural joints may include bonded, bolted, or new innovative joining methods. Structural repairs may include innovative design concepts, new material combinations, and/or manufacturing processes. Topics of interest may include but are not limited to: analysis & design for predicting strength and durability, structural health monitoring for assessing integrity, material selection and processing, 3D printing, non-destructive testing for damage assessment, automated joining and repair processes for repeatability and reliability. The committee welcomes submissions from government, industry, academia, and small businesses.

The committee welcomes submissions from government, industry, academic, and small businesses. All abstracts are peer-reviewed.

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Detailed deadline information, abstract preparation instructions, and policies can be found at: <u>https://www.aiaa.org/SciTech/call-for-content/call-for-papers</u>

Make sure to select "Structural Joints and Repairs" topic option under "Structures" or "Materials" technical discipline when prompted during submission.

For more information, contact one of the following organizers:

Dr. Stephanie TerMaath Dr. Scott Norwood Dr. Richard Li University of Tennessee Lockheed Martin Aurora Flight Sciences scott.norwood@lmco.com li.richard@aurora.aero

The AIAA Structures Technical Committee and Multidisciplinary Design Optimization Technical Committee are sponsoring a Joint Session on

Structural Optimization Application for Air and Space

AIAA SciTech 2025

January 6-10, 2025 Orlando, FL

The AIAA Structures Technical Committee and Multidisciplinary Design Optimization Technical Committee solicits papers with recent research and application on Structural Optimization at the component level as well as vehicle level. Structural optimization plays a critical role in aircraft and spacecraft design throughout a life cycle. It revolutionizes design, analysis and manufacturing of structural components and assemblies resulting in lighter and stronger multifunctional structures that not only meet challenging requirement in aeronautics and astronautics, but also reduce cost and shorten the development timeline. Tremendous opportunities exist in industry to leverage machine learning, data science, design of experiments, optimization methods, tools and processes for structural improvement for new and existing aircraft configurations, innovative component designs, aging fleet part replacements, extreme environment adaptation, etc.

Potential paper topics for this special session include but are not limited to **development and application** of the following technologies at **aircraft and spacecraft component and vehicle level**:

- Topology Optimization
- Topography Optimization
- Lattice Structure Design
- Size Optimization
- Shape Optimization
- Design of Experiments

- Machining Learning/Artificial Intelligence
- Manufacturing Optimization and Manufacturing of Optimized Structures
- Test and/or Certification of Optimized Structures
- Parametric Studies

The committee welcomes submissions from government, industry, academic, and small businesses. All abstracts are peer-reviewed.

Extended abstracts of no less than 1,000 words are due May 23, 2024 Author notification of paper acceptance on or about August 26, 2024 Final manuscript due December 2, 2024

Detailed deadline information, abstract preparation instructions, and policies can be found at: <u>https://www.aiaa.org/SciTech/call-for-content/call-for-papers</u>

Make sure to select the "Structural Optimization Application for Aircraft and Spacecraft" topic option under "Structures" or "Multidisciplinary Design Optimization" technical discipline when prompted during submission.

Zhenning Hu	The Boeing Company	zhenning.hu@boeing.com
Vladimir Balabanov	The Boeing Company	vladimir.balabanov@boeing.com

The AIAA Structures Technical Committee and the Materials Technical Committee are sponsoring a Joint Session on

Structures and Materials in Extreme Environments

AIAA SciTech 2025

January 6-10, 2025 Orlando, FL

The AIAA (American Institute of Aeronautics and Astronautics) Structures Technical Committee and the Materials Technical Committee are soliciting papers with recent research, technological advancements, and systems-level perspectives on Structures and Materials within Extreme Environments within the AIAA SciTech conference. It is the intention to examine advances including:

- Special considerations for materials, design, analysis, and testing of structures in extreme environments (e.g. hypersonic; entry descent, and landing; aircraft and rocket engine; space/planetary exploration; and cryogenic applications)
- Design, analysis, and test methods for materials in extreme environments (e.g. additive structures, lattice structures, high temperature composites)
- Design and analysis methods for combined and/or coupled loads, including modeling, design optimization, and multi-disciplinary analysis (fluid, thermal, and structural interactions; optics; deployable structures)

The committee welcomes submissions from government, industry, academic, and small businesses. All abstracts are peer-reviewed.

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Make sure to select the "Structures and Materials in Extreme Environments" topic option under "Structures" or "Materials" technical discipline when prompted during submission.

Marlana Goldsmith	Jet Propulsion Laboratory	marlana.b.goldsmith@jpl.nasa.gov
Ellen McIsaac	Lockheed Martin	ellen.b.mcisaac@lmco.com

The AIAA Structures Technical Committee and the Materials Technical Committee are sponsoring a Special Session on

Thermoplastic Composites

AIAA SciTech 2025

January 6-10, 2025 Orlando, FL

The American Institute of Aeronautics and Astronautics (AIAA) Structures and Materials Technical Committees solicit papers with recent research and technological advancements on **Thermoplastic Composites** at the AIAA SciTech 2025 conference. Thermoplastic composites offer potential performance, cost, and manufacturing rate benefits to aircraft structures, but several challenges remain.

Topics of interest include, but are not limited to:

- Materials
- Structures
- Design
- Manufacturing
- Degradation

- Modeling
- Testing
- Joining
- Painting
- Repair

The committee welcomes submissions from government, industry, academic, and small businesses. All abstracts are peer-reviewed.

Extended abstracts of no less than 1,000 words are due **May 23, 2024** Author notification of paper acceptance on or about **August 26, 2024** Final manuscript due **December 2, 2024**

Detailed deadline information, abstract preparation instructions, and policies can be found at: <u>https://www.aiaa.org/SciTech/call-for-content/call-for-papers</u>

Make sure to select the "Thermoplastic Composites" topic option under "Structures" or "Materials" technical discipline when prompted during submission.

Dr. Stephen Clay	Air Force Research Lab	stephen.clay.2@us.af.mil
Dr. Evan Pineda	NASA Glenn Research Center	evan.j.pineda@nasa.gov
Dr. Navid Zobeiry	University of Washington	navidz@uw.edu

The AIAA Structures Technical Committee is sponsoring a Special Session on

Additive Structures

AIAA SciTech 2025

January 6-10, 2025 Orlando, FL

Additive manufacturing (AM) using 3D printing has the potential to revolutionize design of many types of structural components if the challenge of designing and fabricating components with reliability sufficient for certification can be met. Opportunities to leverage AM processes for structural improvement include low volume production, aging component replacement, piece part reduction and assembly simplification, material savings, multi-functionality, increased complexity, and weight and performance improvement through generative design optimization free from many conventional manufacturing constraints. Despite these opportunities, formidable challenges remain in manufacturing process reliability, design and analysis methodology, printed part inspection, and certification. The AIAA Structures Technical Committee seeks papers of development and application addressing these challenges at the structural or component level.

Potential topics could include the following:

- AM-informed design, analysis, and optimization methods
- Generative design optimization for AM
- Lattice structure design and application
- Process-structure-property-performance relationships, sensitivities, and models
- Predictive design tools
- Multiscale approaches
- Reliability-based approaches

- Qualification/certification approaches
- Traditional building block approach
- Rapid qualification framework
- Inspection methods—in-situ and postprocess, destructive and non-destructive
- Build simulation, heat treatment, and correlation
- Structures designed for all types of AM processes, including metals and composites

The committee welcomes submissions from government, industry, academic, and small businesses. All abstracts are peer-reviewed.

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Make sure to select "Additive Structures" topic option under "Structures" technical discipline when prompted during submission.

Rob Taylor	University of Texas at Arlington	<u>taylorrm@uta.edu</u>
Zhenning Hu	The Boeing Company	zhenning.hu@boeing.com

The AIAA Structures Technical Committee is sponsoring a Special Session on

Crashworthiness of eVTOL/UAM Vehicles

AIAA SciTech 2025

January 6-10, 2025 Orlando, FL

The AIAA (American Institute of Aeronautics and Astronautics) Structures Committee solicits papers with recent research, technological advancements, and systems-level perspectives on **Crashworthiness of eVTOL/UAM Vehicles** for the AIAA SciTech conference. Aircraft crashworthiness is one fundamental element of assuring the overall safety of eVTOL/UAM operations and must be designed into the vehicle from an early stage. Crashworthiness is the ability of a structure to protect its occupants during an impact. A crashworthy aircraft/rotorcraft can limit the loads transmitted to the occupants to survivable and/or non-injurious, humanly tolerable levels (for a "survivable" impact). Papers are solicited for topics that emphasize crashworthiness due to structural design, rather than counting on the safety benefits of add-on features such as airbags and parachutes.

Potential topics could include but are not limited to the requirements, design, analysis, and testing of:

- Crushable, energy absorbing airframes and/or airframe load attenuation systems
- · Protective passenger cabin structures which provide a survivable volume for the occupants
- Occupant restraint systems and seat track attachments to the airframe
- Next-generation energy-absorbing seats
- Occupant protection
 - Secondary impact due to headstrike/flail in the cabin
 - o Restraint of items of mass such as batteries/powerplants/cargo
 - Ensuring egress capability features after crash/deformation

The committee welcomes submissions from government, industry, academic, and small businesses. All abstracts are peer-reviewed.

Extended abstracts of no less than 1,000 words are due May 23, 2024 Author notification of paper acceptance on or about August 26, 2024 Final manuscript due December 2, 2024

Detailed deadline information, abstract preparation instructions, and policies can be found at: <u>https://www.aiaa.org/SciTech/call-for-content/call-for-papers</u>

Make sure to select "Crashworthiness of eVTOL/UAM Vehicles" topic option under "Structures" technical discipline when prompted during submission.

For more information, contact one of the following organizers:

Rich Manwell

Textron Aviation

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The AIAA Structures Technical Committee is sponsoring a Special Session on

Stitched Composite Structures

AIAA SciTech 2025

January 6-10, 2025 Orlando, FL

The AIAA (American Institute of Aeronautics and Astronautics) Structures Committee solicits papers with recent research, technological advancements, and systems-level perspectives that have been performed for **Stitched Composite Structures** within the AIAA SciTech conference to examine advances relevant to aerospace structures including:

- Manufacturing processes to produce stitched composite structures
- Design approaches to incorporate stitching into composite structures
- Analysis procedures and methods for stitched composite structures for both basic performance and detailed progressive damage assessment
- Testing related to the characterization and/or performance of stitched composite structures at the coupon, subcomponent, or full-scale levels

The committee welcomes submissions from government, industry, academic, and small businesses. All abstracts are peer-reviewed.

Extended abstracts of no less than 1,000 words are due May 23, 2024 Author notification of paper acceptance on or about August 26, 2024 Final manuscript due December 2, 2024

Detailed deadline information, abstract preparation instructions, and policies can be found at: <u>https://www.aiaa.org/SciTech/call-for-content/call-for-papers</u>

Make sure to select "Stitched Composite Structures" topic option under "Structures" technical discipline when prompted during submission.

For more information, contact the following organizer:

Andrew Lovejoy NASA Langley Research Center <u>Andrew.E.Lovejoy@nasa.gov</u>

The AIAA Structures Technical Committee is sponsoring a Special Session on

Structural Health Monitoring & Non-Destructive Evaluation

AIAA SciTech 2025

January 6-10, 2025 Orlando, FL

The AIAA (American Institute of Aeronautics and Astronautics) Structures Technical Committee solicits papers with recent research, technological advancements, and systems-level perspectives on **Structural Health Monitoring (SHM)** as a means to evaluate the integrity of structure by acquiring and analyzing data from sensors and then processing the data to determine the presence of structural damage. As the technology and reliability of SHM sensors mature, the industry will be able to implement SHM systems as an alternative to conventional non-destructive inspections (NDI) such as visual, eddy current, ultrasonic and X-ray inspection methods. An advantage of SHM systems is the ability to assess structure without direct physical access. The introduction of composite materials into the aerospace industry has required many in the **Non-Destructive Evaluation (NDE)** community to re-evaluate their well-established techniques on composite and hybrid material systems. This has led to the development of In-Situ NDI systems. As novel monitoring systems are developed, they must be designed to meet the current standards established by the civil and military aviation authorities.

Potential topics could include the following:

- Probability of Detection for SHM
- Novel SHM systems for Metallic and Composite Structures
- Computational approaches for SHM
- SHM Reliability and Durability
- Novel sensing for damage detection
- Ultrasonics

- Non-Destructive Inspection Techniques
- Fiber optics, Thermography, Eddy Current and X-Ray techniques
- Prognostic and Health Management
- Condition Based Maintenance
- Certification of SHM systems

The committee welcomes submissions from government, industry, academic, and small businesses. All abstracts are peer-reviewed.

Extended abstracts of no less than 1,000 words are due **May 23, 2024** Author notification of paper acceptance on or about **August 26, 2024** Final manuscript due **December 2, 2024**

Detailed deadline information, abstract preparation instructions, and policies can be found at: <u>https://www.aiaa.org/SciTech/call-for-content/call-for-papers</u>

Make sure to select "Structural Health Monitoring & Non-Destructive Evaluation" topic option under "Structures" technical discipline when prompted during submission.

For more information, contact one of the following organizers:

Zeb Tidwell

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The AIAA Adaptive Structures, Structures, and Structural Dynamics Technical Committees are sponsoring a Session

In Honor of Dr. Frank Abdi

AIAA SciTech 2025

January 6-10, 2025 Orlando, FL

Dr. Frank Abdi, the esteemed Founder and Chief Technical Officer of AlphaSTAR Corporation, has been a pivotal figure in pushing the boundaries of computational engineering in aerospace structures through his instrumental work in four key areas: computational damage and fracture modeling, nano-mechanics, virtual simulation of additive manufacturing processes, and structural health monitoring. His groundbreaking contributions in these domains, among others, have not only addressed some of the most significant challenges in the aerospace community but have also gained heightened importance considering emerging trends. These include the development of next-generation aerospace systems, the exploration of alternative energy and propulsion systems, and the drive towards sustainable aerospace solutions.

In recognition of Dr. Abdi's remarkable legacy and the profound impact he has had on the field, we cordially invite researchers to contribute their work to a special session dedicated to celebrating his achievements and enduring influence. This session aims to honor Dr. Abdi's memory by gathering and showcasing research that continues to build upon and be inspired by his visionary work. Join us in paying tribute to a true pioneer whose contributions have indelibly shaped the future of aerospace engineering.

The committee welcomes submissions from government, industry, academic, and small businesses. All abstracts are peer-reviewed.

Extended abstracts of no less than 1,000 words are due May 23, 2024 Author notification of paper acceptance on or about August 26, 2024 Final manuscript due December 2, 2024

Detailed deadline information, abstract preparation instructions, and policies can be found at: <u>https://www.aiaa.org/SciTech/call-for-content/call-for-papers</u>

Make sure to select the "In Honor of Dr. Frank Abdi" topic option under "Adaptive Structures", "Structures", or "Structural Dynamics" technical disciplines when prompted during submission.

For more information, contact one of the following organizers:

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