Call For Papers

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

Adaptive Spacecraft Structures and Systems

AIAA SciTech 2027
January 11-15, 2027
Hyatt Regency Orlando
Orlando, FL

The AIAA (American Institute of Aeronautics and Astronautics) Adaptive Structures Committee, Spacecraft Structures Committee are soliciting papers with recent research, technological advancements, and systems-level perspectives on **Adaptive Spacecraft Structures and Systems.** This includes the full range of intelligent spacecraft structures developments including, but not limited to:

- Morphing space structures for packaging and deployment.
- Spacecraft structures featuring active materials for reconfiguration.
- Active apertures for antennas and sensing systems.
- Reconfigurable structures for in-space assembly.
- Programmable mechanical properties in lightweight 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 21st, 2026.**
Author notification of paper acceptance on or about **August 24th, 2026**
Final manuscript due **December 1st, 2026**

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 "Adaptive Spacecraft Structures and Systems" topic option under "Adaptive Structures" or "Spacecraft Structures" technical discipline when prompted during submission.

For more information, contact one of the following organizers:

Fabien Royer	Cornell University	fabienr@cornell.edu
Marcias Martinez	Clarkson University	mmartine@clarkson.edu

Call For Papers

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

Special Session: Aircraft Load Alleviation and Control

AIAA SciTech 2027
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Overview

The AIAA Structural Dynamics Technical Committee and the AIAA Adaptive Structures Technical Committee invite submissions to the **Special Session: Aircraft Load Alleviation and Control** at the **AIAA SciTech 2027 Forum**. As modern aircraft designs, including eVTOL and hybrid-electric concepts, are tending towards lighter and more flexible designs, the need for improved gusts, maneuvers and ground loads alleviation becomes increasingly important to meet structural efficiency, performance, and certification requirements. This session focuses on innovative concepts, control strategies, experimental demonstrations, and integrated design approaches aimed at reducing structural loads and improving aeroelastic performance.

Topics of Interest

Authors are invited to submit papers in areas including, but not limited to:

Active and Passive Load Alleviation Techniques

- Gust load alleviation
- Maneuver load control
- Wing load reduction concepts
- Passive, semi-active, and hybrid load mitigation solutions

Aeroelastic Modeling and Simulation

- High-fidelity and reduced-order aeroelastic models
- Nonlinear aeroelastic behavior
- Integrated aerodynamic–structural modeling frameworks
- Verification and validation of load-alleviation simulation tools

Flight Control Approaches for Load Reduction

- Integrated flight and structural control
- Robust, adaptive, and optimal controllers
- Model-predictive control for load management
- Handling qualities with load-alleviating control laws

Morphing and Adaptive Structures

- Morphing wings and adaptive surfaces
- Distributed actuation concepts

- Smart material-based load control
- Folding wing tips
- Pop up spoilers
- Structural adaptation for performance enhancement

Aeroelastic Tailoring and Structural Optimization

- Composite tailoring for passive load alleviation
- Anisotropic stiffness distribution and fiber-orientation optimization
- Twist and bending tailoring for load and flutter control
- Integrated aerodynamic–structural optimization
- Tailored wings for high-aspect-ratio and flexible aircraft

Data-Driven and AI-Enabled Load Alleviation Methods

- Machine-learning–based gust and load prediction
- AI-assisted load estimation and sensor fusion
- Reinforcement learning for active load control
- Surrogate modeling for rapid aeroelastic analysis
- Digital twins for real-time structural loads management
- AI-accelerated design exploration for load-optimized structures

Experimental and Flight Demonstrations

- Wind-tunnel tests and subscale demonstrators
- Full-scale flight test results
- Experimental validation of active and passive load-alleviation concepts
- Sensing devices including LIDAR
- Sensing strategies and real-time estimation techniques

Applications to Next-Generation Aircraft Architectures

- High-aspect-ratio transport wings
- Hybrid-electric, hydrogen, and distributed-propulsion aircraft
- eVTOL and advanced air mobility vehicles
- Flexible, lightweight future aircraft concepts

Session Organizers

- **Dr. Jonathan Cooper**, Structural Dynamics TC j.e.cooper@bristol.ac.uk
- **Dr. Roeland De Breuker**, Adaptive Structures TC r.debreuker@tudelft.nl

Extended abstracts of no less than 1,000 words are due
Author notification of paper acceptance on or about
Final manuscript due

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 "TITLE" topic option under "Adaptive Structures" or Structural Dynamics technical discipline when prompted during submission.

The AIAA Structures Technical Committee and the Adaptive Structures Technical Committee is sponsoring a Special Session on

Physically and Mechanical Embodied Computing in Aerospace Systems

AIAA SciTech 2027

January 11-15, 2027
Hyatt Regency Orlando
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The AIAA (American Institute of Aeronautics and Astronautics) Adaptive Structures Technical Committee solicits papers with recent research, technological advancements, and systems-level perspectives on the emerging field of mechanical intelligence and embodied physical computation in material systems and adaptive structures. Recently, physically embodied and mechanical computing has emerged as an alternative paradigm that departs from the transistor and binary logic paradigm, embracing a biologically inspired approach in which memory and computation occur concurrently and physically collocated. This paradigm offers concrete paths for merging standard functions of adaptive structures, such as sensing and shape reconfiguration, with computational substrates that leverage multi-physics couplings to realize autonomous systems capable of displaying highly integrated sense, compute, and react loops. This special session aims to provide a forum that crosses the borders of adaptive structures and embodied intelligent matter communities to motivate synergies and idea exchange, resulting in novel pathways to achieving intelligent structural systems with learning, memory, and decision-making capabilities embedded in the mechanical domain**.** Potential topics could include the following:

- Physical reservoir computers for flow sensing and computation
- Mechanical signal processing and memory formation in adaptive structures
- Embodied shape control from mechanical instabilities
- Fluid dynamics-based physical reservoirs
- Fluid-structure interactions for physical computation
- Neuromorphic computing for aerospace structures
- Bioinspired mechanisms for sensing and memory formation
- Mechanical computing for morphing applications

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 26, 2026** Author notification of paper acceptance on or about **August 24, 2026** Final manuscript due **December 1, 2026**

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 "Physically and Mechanical Embodied Computing in Aerospace Systems" topic option under "Adaptive Structures" technical discipline when prompted during submission.

For more information, contact one of the following organizers:

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