# Special/Joint Session Information

# Adaptive Aircraft Surfaces and Structures for Sonic Boom Mitigation

AIAA SciTech 2020 6-10 January
Orlando, FL, Hyatt Regency Orlando

The AIAA Adaptive Structures and Applied Aerodynamics Technical Committees are pleased to solicit papers for presentation in a special joint session on **Adaptive Aircraft Surfaces and Structures for Sonic Boom Mitigation**. There is a USA nationwide interest in low-boom supersonic aircraft, but it is not clear that required sonic boom signature levels can be met for changing flight and/or atmospheric conditions. This session considers multi-disciplinary efforts to explore the mitigation of sonic boom signatures by means of adapting the local geometric configuration of supersonic aircraft in a distributed manner. Content may contain studies on distributed structural morphing, active materials tuned to achieve such morphing given the specific flight conditions of supersonic platforms, experimental and computational assessments regarding the sensitivity of shock waves and propagated sonic booms to aircraft outer mold line, and the sensing needed to enable real-time aerostructural adaptivity.

**Paper Submission Timeline**

- Extended abstracts (>1,000 words) are due **11 June 2019**
- Select "**Special Sessions**" when submitting to Adaptive Structures
- Author notification of paper acceptance on **30 August 2019**
- Final manuscripts are due **2 December 2019**

For more information, please contact Darren Hartl (darren.hartl@tamu.edu) and Nathan Tichenor (ntichenor@tamu.edu)

# Adaptive Spacecraft Structures

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There has been an increasing interest in in-orbit control of spacecraft structures and systems using active materials. Examples include shape correction of space apertures and controlled deployment of solar arrays and sails, leading to the benefits of enhanced mass and packaging efficiency, lowered manufacturing complexity, and improved deployment reliability. This session invites research efforts on the integration of active material strategies in design of spacecraft structures. Topics of interest include, but are not limited to (1) sensor and active materials for use in space environments (e.g., lightweight, high actuation strain and/or stress, cryogenic temperatures), (2) integration schemes for sensing and active materials in spacecraft structures and systems, and (3) design, analysis, fabrication and testing of spacecraft structures with embedded active elements.

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# Adaptive Structures and Aircraft Design

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Papers are sought describing the aircraft design-level impacts of adaptive and morphing structures on fixed-wing and rotary-wing inhabited and uninhabited aircraft. Papers may describe past and/or new adaptive aerostructures concepts, how they function and the system and super-system level benefits to be had, and associated costs, penalties and operational issues. It is expected that the overall impacts on aircraft weights, weight fractions, power budgets, aeromechanics, lift-to-drag ratios, specific range, acquisition cost, direct operating costs, life-cycle costs, fatigue-life, certificability and maintenance, repair and overhaul will be considered. Papers describing promising approaches that should be considered will be welcomed. Papers describing concepts with challenging issues, suboptimal solutions or "show-stopping" problems will also be welcomed. Papers describing a single adaptive or morphing concept, multiple concepts or sweeping technology reviews are encouraged. Authors are asked to be ready to engage in lively and frank discussions. Audience members will be asked to be polite devil's advocates.

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# Morphing Rotor Blades

## AIAA SciTech 2020 6-10 January
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The design of rotor systems is highly constrained by the demanding and widely varying operating conditions they must endure. These constraints require significant compromise in the design of the blade geometry between competing flow conditions, for example, between hover and forward flight, or blades enduring various flow regimes during one revolution, resulting in blades that operate suboptimally over an entire revolution. The optimal aerofoil and blade shapes for these conditions are distinctly different. Therefore, this special session is soliciting papers that deal with proposing solutions to the aforementioned challenges. Modeling approaches, numerical solutions and hardware implementations are all suitable for this special session.

**Paper Submission Timeline**

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- Select "**Special Sessions**" when submitting to Adaptive Structures
- Author notification of paper acceptance on **30 August 2019**
- Final manuscripts are due **2 December 2019**

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