AIAA SciTech 2024 Call for Papers
Applied Aerodynamics Technical Discipline

Papers are solicited in the areas of theoretical, experimental, and computational approaches to aerodynamics applications. Relevant areas of interest include, but are not limited to, flight or ground vehicle aerodynamic design, analysis of wing/rotor/vehicle aerodynamic performance, methods for modeling aerodynamic bodies, and novel studies or technological applications related to aerodynamic applications. Specific areas of interest are listed below.

Applied Aerodynamics Subtopics:

Aerodynamic Testing: Ground, Wind-Tunnel, and Flight Testing
Aero-Propulsive Interactions and Aerodynamics of Integrated Propellers
Aero-Structural Interactions
Aerodynamic Design: Analysis, Methodologies, and Optimization Techniques (joint APA/ACD)
Aerodynamics of Inlets and Nozzles (joint APA/INSPI)
Airfoil/Wing/Configuration Aerodynamics
Applied Aeroelasticity and Aerodynamic-Structural Dynamics Interaction
Applied Computational Fluid Dynamics
Environmentally Friendly / Efficient Aerodynamics
Flow Control: Methods and Applications (joint APA/FD)
Hypersonic Aerodynamics (joint APA/FD)
Low Speed & Low Reynolds Number Aerodynamics
Meshing, Geometry Modeling, and Visualization for Applied Aerodynamics (joint APA/MVCE)
Other Topics in Applied Aerodynamics
Reduced Order Aerodynamic Modeling & System Identification
Supersonic Aerodynamics (joint APA/SPSN)
Transonic Aerodynamics
Turbulence and Transition Modeling
Unmanned, Bio-Inspired, Solar Powered Aerial Vehicle Design
Unsteady Aerodynamics

Applied Aerodynamics Special Sessions:

Special Session: Applied Aerodynamics: State of the Art (Invited)
Special Session: Applied Surrogate Modeling
Special Session: Artemis I Aerosciences Flight Data Analysis (Invited)
Special Session: Certification of Advanced Air Mobility Aircraft
Special Session: Drag Reducing Surfaces
Special Session: HPC Multi-Physics CREATE
Special Session: North Atlantic Treaty Organization Science and Technology Organization
Special Session: Rotor-in-Hover Simulation
Special Session: Sailplane Aerodynamics and Design

Special Session: University Consortium for Applied Hypersonics (UCAH) (joint GNC/AA/APA)
Special Session: Updates to the NASA SUSAN Electrofan Trade Study (Invited)

Additional detail on Applied Aerodynamics Special Sessions:

Special Session: Applied Aerodynamics: State of the Art (Invited)
This invited session aims at providing an overview of applied aerodynamics with presentations from experts who lead various discussion groups within the AIAA APATC. The goal is to foster cross-fertilization of research methods & technical collaborations for non-subdiscipline experts as well as across the aerospace community.
POC: Reza Djeddi, reza.djeddi@outlook.com or rezadj@cadence.com

Special Session: Applied Surrogate Modeling
Papers in this session will focus on applied surrogate modeling. Surrogate modeling is a technique applied by many individuals in different fields throughout the aerospace community. This DG aims to provide a collaborative environment for these individuals to discuss best practices and future directions.
POC: Nathan Hariharan, nathan.s.hariharan.ctr@mail.mil

Special Session: Artemis I Aerosciences Flight Data Analysis (Invited)
This invited technical session will focus upon post-flight data from the Artemis I Space Launch System flight as well as comparisons to both experiments and computations.
POC: Brent Pomeroy, brent.w.pomeroy@nasa.gov

Special Session: Certification of Advanced Air Mobility Aircraft
One of the key steps to realizing the full potential of Advanced Air Mobility (AAM) is to ensure the aircraft are safe, reliable, and quiet. The Federal Aviation Administration (FAA) and other agencies around the world are working to establish requirements and standards for certifying the air vehicle design, training and qualifying operators and maintenance technicians, and developing the infrastructure needed to support the movement of passengers and cargo in areas that were previously not served or underserved by aviation. These systems encompass a wide variety of designs, including electrically-powered vertical takeoff and landing (eVTOL) aircraft that are self-flying or autonomous. We are seeking papers that discuss development of requirements, standards, and methods of compliance for certifying AAM aircraft. Specific topics include, but are not limited to the following:

- Air Vehicle Design
- Autonomous Flight
- Collision Avoidance Systems
- Degraded Visual Environments
- Electric Propulsion
- Exterior and Interior Noise Levels
- Flight Control Systems
- Health Awareness Systems
- Maintenance Technician Training

- Operator Training
- System Safety Analyses
- Vertiport Design

POC: Thomas L. Thompson, thomas.l.thompson3.civ@army.mil

Special Session: Drag Reducing Surfaces
Drag reduction on aircraft continues to receive attention for several reasons including increased fuel costs, concern for environmental impacts, and a desire for increased performance. Over the past decade, interest about drag reducing surfaces has re-emerged, and recently such surfaces have been deployed on operational aircraft. This special session on drag reducing surfaces seeks to generate a dialogue among those working in this area with topics such as new and optimized surfaces, manufacturing processes, computational and experimental studies of interest.
POC: Monica Kracy, monica.kracy@ngc.com

Special Session: HPC Multi-Physics CREATE
The HPCMP CREATETM (Computational Research and Engineering Acquisition Tools and Environments) program provides state-of-the-art software tools to support the DoD acquisition process. These multi-physics tools cover a broad range of applications to support the simulation of air vehicles, RF antennas, ships, and ground vehicles.
POC: Nathan Hariharan, nathan.s.hariharan.ctr@mail.mil

Special Session: North Atlantic Treaty Organization Science and Technology Organization
This special session is organized to provide a collaborative platform between AIAA and NATO STO communities. All NATO STO members are welcomed to contribute by submitting a technical paper or put together an oral presentation.
POC: Mehdi Ghoreyshi, mehdi.ghoreyshi.crt@sfacademy.af.edu

Special Session: Rotor-in-Hover Simulation
Papers in these sessions will focus on hover simulations and particularly blind predictions of the upcoming NASA/U.S. Army Hover Validation and Acoustic Baseline (HVAB) rotor test in the National Full-Scale Aerodynamics Complex (NFAC) 80- by 120-Foot Wind Tunnel at NASA Ames. Participants are encouraged to show predictions for rotor performance, blade loads, tip-vortex trajectories, elastic deformations, and boundary-layer transition locations using their best practices. Papers should detail the analysis approach including grid and solution convergence. Also encouraged are studies of aeroelastic effects, facility impact, wake capturing, boundary-layer modeling and wake-turbulence modeling. These sessions are a continuation to the previous SciTech special hover sessions that were held from 2014 to 2023.
POC: Nathan Hariharan, nathan.s.hariharan.ctr@mail.mil

Special Session: Sailplane Aerodynamics and Design
This joint session explores research topics relevant to sailplanes and other ultra-efficient subsonic aircraft. Papers are solicited that address low-drag aerodynamics; design optimization; flight mechanics and trajectory optimization for efficient use of the atmosphere; variable geometry concepts; structural optimization, and aeroelasticity of high aspect-ratio wings. Both analysis and experiment are of interest, as are topics involving the interaction of multiple disciplines. The session will be organized cooperatively by the Applied Aerodynamics TC and

OSTIV (Organisation Scientifique et Technique Internationale du Vol `a Voile – the International Scientific and Technical Soaring Organization).
POC: Goetz Bramesfeld, bramesfeld@torontomu.ca and Rolf Radespiel, r.radespiel@tu-braunschweig.de

Special Session: University Consortium for Applied Hypersonics (UCAH) (joint GNC/AA/APA)
This joint track, co-hosted by the GNC and Applied Aerodynamics Technical Committees invites papers on all topics under the purview of the University Consortium for Applied Hypersonics (UCAH; https://hypersonics.tamu.edu/) including guidance, navigation and control methods for hypersonic systems. Note that GNC submissions to this joint track require adherence to the GNC requirement of a full draft manuscript, which must include sufficient detail to allow informed evaluation by the assigned reviewers. Extended abstracts will be returned without review. Full draft manuscripts must not exceed a total length of 25 pages, formatted in accordance with the AIAA SciTech manuscript template. Examples of specific topics for this area include, but are not limited to, the following:

- Materials, Structure and Thermal Protection Systems
- Guidance Navigation and Control
- Air Breathing Propulsion
- Applied Aerodynamics
- Phenomenology
- Energetics (solid fuel, ordnance, etc.)
- Ground and Flight Testing
- Modeling and Simulation

POC: Michael Niestroy, michael.a.niestroy@lmco.com

Special Session: Updates to the NASA SUSAN Electrofan Trade Study (Invited)
This invited special session will provide an update on the NASA SUSAN Electrofan trade study. Papers will relate to the ongoing development and analysis of the SUSAN 180 PAX hybrid electric aircraft concept, as well as the development of requirements, operational concept, risk reduction work for SUSAN 25% flight research vehicle.
POC: Ralph Jansen, ralph.h.jansen@nasa.gov