# AIAA SciTech 2025 Call for Papers Applied Aerodynamics (APA) 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, but work in related areas is also encouraged. Note that oral-only presentations (no paper publication) may only be accepted for special invited sessions. The only exception below is the subtopic "History and Evolution of Aircraft Designs and Design Methodologies (joint APA/HIS)".

# **APA Subtopics:**

- Aerodynamic Design: Analysis, Methodologies, and Optimization Techniques (joint APA/ACD/MDO)
- Aerodynamic Testing: Ground, Wind-Tunnel, and Flight Testing (joint APA/GT)
- Aerodynamics of Inlets and Nozzles (joint APA/INSPI)
- Aero-Propulsive Interactions and Aerodynamics of Integrated Propeller Systems
- Aero-Structural Interactions
- Airfoil/Wing/Configuration Aerodynamics
- Applied Aeroelasticity and Aerodynamic-Structural Dynamics Interaction
- Applied Computational Fluid Dynamics
- CFD on Large-Scale Meshes for Applied Aerodynamics (joint APA/CFD2030/MVCE)
- Environmentally Friendly / Efficient Aerodynamics
- Flow Control: Methods and Applications (joint APA/FD)
- History and Evolution of Aircraft Designs and Design Methodologies (Joint APA/HIS)
- Hypersonic Aerodynamics (joint APA/FD)
- Low Speed, Low Reynolds Number & Bio-Inspired Aerodynamics
- Missile/Projectile/Munition Aerodynamics, Carriage & Store Separation
- Propeller/Rotorcraft/Wind Turbine Aerodynamics
- Reduced Order Aerodynamic Modeling & System Identification
- Supersonic Aerodynamics (joint APA/SPSN)
- Transonic Aerodynamics
- Turbulence and Transition Modeling for Aerodynamic Applications
- Unsteady Aerodynamics
- Visualization and Knowledge Extraction of Large Data Sets (joint APA/CFD2030/MVCE)
- Other Topics in Applied Aerodynamics

# **APA Special Sessions:**

- Special Session: 2nd AIAA Stability and Control Prediction Workshop (Invited)
- Special Session: Active Flow Control, in Honor of Avi Siefert (Invited, Joint APA/FD)
- Special Session: Applied Aerodynamics: State of the Art (Invited)

- Special Session: Applied Surrogate Modeling (Invited)
- Special Session: HPC Multi-Physics CREATE (Invited)
- Special Session: NATO AVT-350: Novel Control Effectors: Advanced Concepts (Invited)
- Special Session: Rotor-in-Hover Simulations (Invited)

## **APA Special Session Details:**

### Special Session: 2nd AIAA Stability and Control Prediction Workshop (Invited)

Papers in these sessions will be presented by participants in the 2nd AIAA Stability and Control Workshop. The objectives of the AIAA Stability and Control Prediction Workshop (S&CPW) series are to establish best practices for the prediction of Stability and Control (S&C) derivatives with computational fluid dynamics (CFD) and assess the limitations of these CFD methods when those best practices are applied. The second S&CPW (S&CPW2) will focus on prediction of static and dynamic stability derivatives for the high-speed NASA/Boeing Common Research Model (CRM). NASA Langley Research Center collected static and force oscillation data for a 2.4% scale version of the CRM in the Langley 12-Foot Low-Speed Tunnel in Fall 2023. The wind-tunnel data will be used for a blind comparison to CFD predictions; the data will not be publicly released until CFD predictions for the workshop have been completed.

POC: Andrew Lofthouse, <u>Andrew.Lofthouse.2@us.af.mil</u>

### Special Session: Active Flow Control, in Honor of Avi Siefert (Invited, Joint APA/FD)

Please join us in celebrating the technical contributions and inspired mentoring over the years by our colleague and friend Dr. Avi Siefert. Consider submitting an overview of your work in cooperation with Avi in the area of Flow Control. Abstracts for written papers are preferred, however, abstracts for oral-only presentations may be accepted. *POC: Martigua Post, Martigua.Post@afacademy.af.edu* 

### Special Session: Applied Aerodynamics: State of the Art (Invited)

This session aims at providing an overview of applied aerodynamics with presentations from experts from within the APATC as well as other TCs. 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, <u>reza.djeddi@outlook.com</u>

### Special Session: Applied Surrogate Modeling (Invited)

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: HPC Multi-Physics CREATE (Invited)

The HPCMP CREATE<sup>™</sup> (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, <u>nathan.s.hariharan.ctr@mail.mil</u>

#### Special Session: NATO AVT-350: Novel Control Effectors: Advanced Concepts (Invited)

AVT-350 investigates the feasibility of fluidic actuation for aircraft control during takeoff and landing from an aerodynamic as well as systems engineering point of view. POC: Jürgen Seidel, jurgen.seidel@afacademy.af.edu

#### Special Session: Rotor-in-Hover Simulations (Invited)

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 2024.

POC: Nathan Hariharan, nathan.s.hariharan.ctr@mail.mil