

AIAA SciTech 2022 Call for Papers Supplemental Information

Special Sessions Sponsored by the Applied Aerodynamics Technical Committee

Special Session: University Leadership Initiative for Ultra-Efficient Aircraft

A NASA-funded University Leadership Initiative program targeted at ultra-efficient commercial aircraft has identified the slotted, natural-laminar-flow airfoil as an enabling technology to meet N+3 fuel/energy consumption goals. Developing and integrating this airfoil technology into an aircraft platform is a highly multidisciplinary undertaking, and papers in this session will describe progress on this effort.

Contact: Jim Coder (jcoder@utk.edu)

Special Session: CFD Transition Modeling and Prediction

This invited session is a follow-on from the 1st AIAA CFD Transition Modeling and Prediction Workshop. Participant papers and presentations aim to 1) Assess the current state of the art in laminar-turbulent transition prediction in an industrial CFD environment; 2) Determine and document best practices for transitional flow simulations; 3) Verify transition/turbulence model implementations; and 4) Encourage risk taking by participants and promote improvements to CFD prediction capabilities.

Contact: Jim Coder (jcoder@utk.edu)

Special Session: Vortex Interaction Aerodynamics: NATO/STO AVT-316 Sessions

A current NATO Science and Technology Organization (STO) Research Task Group has been studying vortex interaction aerodynamics that are relevant to military air vehicle performance. The Task Group, AVT-316, is comprised of over 40 scientists and engineers representing 24 institutions and 8 countries and has been performing focused aerodynamic assessments for 4 years on missile and aircraft geometries that are anchored in industry interests. The research has included numerical and experimental investigations and spans subsonic, transonic, and supersonic speeds.

Four special sessions have been organized to highlight the Task Group findings. These will include a program overview followed by results from the missile and aircraft studies. Task Group objectives, technical findings, and lessons learned will be presented for both. The technical findings will span numerical modeling and sensitivity assessments, new wind tunnel experimental findings, correlations between computational and experimental data, flow physics interpretations, and configuration aerodynamics observations. A total of 24 papers is anticipated.

Contact: Jim Luckring (jmluckring@cox.net, james.m.luckring@nasa.gov)

Special Session: HPC Multi-Physics CREATE Sessions

CREATE is part of the Defense Department's High Performance Computing Modernization Program. This set of special sessions focuses on large-scale multi-physics simulations of full-up air vehicles using high performance computing strategies. Simulations include fixed-wing and rotary-wing capability demonstration, verification/validations and applications to deployment scenarios.

Contact: Nathan Hariharan (nathan.hariharan.ctr@hpc.mil)

Special Session: Rotor-in-Hover Simulation Sessions

The AIAA Applied Aerodynamics Rotorcraft Simulation Discussion Group will be organizing multiple special sessions at SciTech 2021. Papers in these sessions will focus on hover simulations and most particularly blind predictions of the upcoming NASA HVAB rotor test in the NFAC test facility. Guidance on final test-article geometry, aero-elastic effects and test conditions will be provided in the HPW website (<https://aiaahover.wixsite.com/website-6>) by early summer. Participants are encouraged to show predictions of 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. Studies of elastic effects, facility impact, wake capturing, boundary layer and wake turbulence modeling are also encouraged. These sessions are a follow up to the special hover sessions from SciTech 2014 - SciTech 2020.

Contact: Nathan Hariharan (nathan.hariharan.ctr@hpc.mil)

Special Session: Supersonic Configurations and Low Speeds

The Low Boom discussion group is planning to have this special session during SciTech 2022 to disseminate the latest technology developments.

Contact: Elmiligi Alaa (alaa.a.elmiligi@nasa.gov)

Special Session: Aeroelastic Prediction Workshop (AePW) Sessions (joint APA/WE)

The Aeroelastic Prediction Workshop (AePW) community (<https://nescacademy.nasa.gov/workshops/AePW3/public>) is planning to organize three sessions during SciTech 2022. The purpose of these sessions is to document and to report on AePW latest progress and technology developments covering large deflection, high angle of attack and flight test.

Contact: Chwalowski Pawel (pawel.chwalowski@nasa.gov)

Special Session: Collaborative Experimental-Computational Efforts in High-Speed FSI

This special session will highlight recent collaborative computational-experimental efforts in high-speed fluid-thermal-structural interactions. This session is jointly sponsored by the Aerodynamic Measurement Technology, Applied Aerodynamics, Fluid Dynamics and Structural Dynamics Technical Committees (AMT-APA-FD-SD).

Contact: Bodony, Daniel J (bodony@illinois.edu)

Special Session: Results from the 1st AIAA Stability and Control Prediction Workshop

This special session will present the results from the 1st AIAA Stability and Control Prediction Workshop. The workshop objectives were to establish best practices for the prediction of S&C derivatives with RANS or hybrid RANS/LES CFD and to assess the limitations of these CFD methods when those best practices are applied; to provide an impartial forum for evaluating the effectiveness of existing computer codes and modeling techniques using RANS and DES solver; and to identify areas in need of additional research and development.

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