Atmospheric and Space Environments

Call for Papers: Additional Details

Subtopic Descriptions

Sponsored by the Atmospheric and Space Environments Technical Committee

Aircraft Icing/Deicing

- Swept wing icing and simulation: This session will target results from the SUNSET II swept wing program.
- Engine and air-data system ice-crystal icing test results, facilities, and simulations including fundamental studies.
- Aircraft (including rotorcraft, UAVs, and UAMs) in-flight icing, simulation and performance effects.
- Certification and regulatory policies and procedures.
- Ground deicing/anti-icing fluids, effects, facilities.
- Ice accretion physics, scaling and simulation.
- Ice protection and detection systems.
- Supercooled large-droplet icing simulation, facilities and test methods.
- Icing education and training including material development.
- Icing environment characterization including in-situ measurements, remote sensing, and forecasting.
- Wind turbine icing and ice protection.
- Ice adhesion measurement and modeling

Contact: Stephen McClain, Baylor University

Wake Turbulence, and other Atmospheric Hazards to Aviation Operations

- Fundamental aviation hazards such as aircraft wake vortices, severe and convective weather, atmospheric turbulence (CIT and CAT), wind shear, low ceilings, low visibility, obscurations or other obstructions to vision, such as volcanic ash and forest fires.
- Aviation safety and operations factors including weather accident prevention and improved concepts for measurement, prediction, and display of wake and weather hazards.
- Improved short-term forecasting of aviation hazards using numerical weather prediction models and observations for developing avoidance and mitigation procedures.
- Space weather.

Contact: Z. Charlie Zheng, The University of Kansas

Observations and Modeling of the Atmospheric Environment

- Observations and characterization of the Earth's atmosphere using ground-based, airborne (manned and unmanned), and space-borne remote and in situ instruments.
- Design and testing of advanced instruments (satellite, airborne (manned and unmanned), and ground-based systems) including performance verification, validation and calibration of remote sensing instruments.
- Numerical weather prediction including meso- to micro-scale modeling and large eddy simulations of atmospheric processes. Topics include the development of new advanced modeling techniques as well as characterization of the atmospheric environment, especially for emerging aviation applications like unmanned aerial systems and urban air mobility.
- Environmental standards such as reference and standard atmosphere and other environmental models and their applications.

Contact: Fred Proctor, NASA Langley Research Center

Environmental Impacts to the National Airspace System

- Impact of weather on the efficiency and capacity of the National Airspace System (terminal area and en-route environment).
- Decision support tools with integrated weather information for aviation operations.
- Communication of weather information to the flight deck, air traffic controllers, and the airline operators.
- Integration and use of environmental data in real or simulated operations.
- Atmospheric environment and UAS operations, including weather-related challenges for integration of UAS into the National Airspace System.
- Green aviation, including the assessment of the impacts of aviation on climate and air quality, atmospheric radiation studies, chemistry and contrail studies.

Contact: Matthew Pruis, Sage Data Science

Additional Topics

Additional topics will be considered as appropriate for this conference. Please direct any questions to the Atmospheric and Space Environments Technical Discipline Chairs:

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Student Paper Competition

Atmospheric and Space Environments Student Paper Competition

Undergraduate and graduate students are encouraged to submit papers for consideration in the Atmospheric and Space Environments Student Paper Competition. Entries to the Student Paper Competition will be presented in regular technical sessions with other papers in their topic area and archived as AIAA papers.

Eligibility

To be eligible for this award, the student must be an AIAA member or student member, the primary author of the paper, and in attendance at the conference to present the paper. In addition, all work must have been performed while the author was a student.

Judging Criteria

The written papers will be judged based on the following criteria: (1) originality (is the work original, or is it something that has been addressed in the past); (2) technical quality (appropriate level of technicality and free of errors); (3) organization, completeness, grammar and usage (style and clarity); (4) literature review/acknowledgement of prior work and explanation of the relevance to the work presented in the paper; (5) accuracy of experimental or numerical results (ref. AIAA standards for journals); (6) importance/contribution to field. The student author of the best paper will receive a certificate and a cash award after the conference.

Contact: Z. Charlie Zheng, The University of Kansas and Stephen McClain, Baylor University