AIAA Aviation 2027 CFP
Design Engineering Technical Discipline

Technical Discipline Chair

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Topic Description

Technical papers are solicited on design processes/methods, lifecycle design tools, human & organizational aspects of systems design, and design education in aerospace/related industries. Process-oriented papers focus on methods, architecture, and approaches from exploratory design through detailed design, manufacturing, and service. Education-oriented papers emphasize design in curriculum development, class content, or student design/build activities. Product-oriented papers capture innovative/distinctive concepts or demonstrate design efficiency improvement. Emerging technologies for collaborative design within global digital environments, mission effectiveness design, knowledge-based approaches, multidisciplinary, multifidelity design optimization, trustworthiness, decision making under uncertainty, innovative design processes, tools, and technologies applicable to aeronautics and astronautics are desired. Novel coverage of more traditional disciplines of structural design, mechanical design, geometric design, aerodynamic/flight performance design, and aircraft/spacecraft design are welcome. Cutting-edge approaches employing computational intelligence/creativity, human-machine teaming, cognitive aspects of design, AI/ML beyond surrogate modeling, model-based engineering, multifunctional or adaptive structures, leveraging novel energy sources, etc. are strongly encouraged.

Subtopics

- Human, cognitive, team, and organizational aspects of the design process across the full lifecycle
- Integrating new technologies and emerging capabilities in systems design
- Novel systems, system of systems, and mission designs
- Emerging design methods, tools, or processes, including model-based eng. & MBSE (joint DE/DGE/MST)
- Computational intelligence, AI/ML assisted design, and physics informed methods (joint DE/DGE/IS)
- Knowledge representation and knowledge-based approaches (joint DE/DGE/IS)
- Design for system lifecycle needs including -ilities & effectiveness-based design
- Creative design, emerging trends, new processes, novel aerospace applications (joint DE/HMT/SAT)
- Designing collaborative autonomous sys, multi-vehicle, swarming, & operator needs (joint DE/HMT)
- Trustworthiness & reliance in adopted intelligence/automation tools & processes (joint DE/IS/SAT)
- Multidisciplinary holistic design and decision-making under uncertainty (ACD/DE/MDO)
- Societal implications of applied AI, autonomy, and human-machine decision-making (joint DE/SAT)
- V&V and uncertainty quantification in digital twins/threads and digital eng. (joint DE/DGE)
- Advanced manufacturing, composites, adaptive structure design, topology opt., and rapid prototyping
- Multifunctional and multipurpose air and space systems design (joint ACD/DE)
- Advances in design education, K-12 STEAM initiatives, extended university curricula (joint ACD/DE)
- Special Session: Vision for next generation design methods, processes, tools, and technologies
- Other topics, methods, processes, tools, or technologies related to design engineering

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Abstract Submission Guidelines

To promote high quality technical papers, extended abstracts conforming to the following guidelines are highly encouraged:

- AIAA provides templates for conference papers that can help organize and format both your abstract and technical paper. Following these templates is not mandatory for the abstract, but must be followed for your final paper submission once accepted https://www.aiaa.org/events-learning/events/Technical-Presenter-Resources
- Authors are required to submit an extended abstract that clearly outlines the objectives and purpose of their paper, relevant background, preliminary results to date, and anticipated conclusions and advancements to the state of the art. There is no minimum required abstract length, but nearly complete or draft papers tend to score higher.
- The following content guidelines are helpful when preparing your extended abstract submission:

  Abstract: The submitted extended abstract should begin with a concise abstract summarizing the purpose and anticipated key points of the completed paper

  Introduction: The introduction provides background and context, a brief assessment of prior work, and the paper's expected key contributions

  Technical Sections: These sections should provide sufficient detail on the methodology, technical approach, and anticipated results to allow paper reviewers to appropriately assess technical merit and importance of the authors' contributions to the state of the art, including
    - Relevant figures, diagrams, and flowcharts to aid in developing the technical approach
    - Preliminary results that support important contributions or impact
    - Other evidence demonstrating intended paper scope and current status of the effort to indicate likelihood of completing technical paper on time

  References: As utilized and relevant to the proposed work and to provide provenance of concepts further developed or research proposed – do not list references not cited in the submitted manuscript

Note that draft theses, dissertations, journal articles, book chapters, and similar material do not fit the intent and typically do not score well. These types of submissions most often result in rejection.