AIAA Fluid Dynamics Technical Committee (FDTC)
Abstract Guidelines
AIAA Science and Technology Forum and Exposition (SciTech)

Note: Authors submitting abstracts are strongly encouraged to review the extended abstract guidelines below. Non-conforming abstracts will be rejected during the review process.

Guidelines for Submitting Extended Abstracts:
To ensure high-quality technical papers, extended abstracts must conform to the guidelines stated below. Submissions that do not comply with these requirements will be rejected during abstract review.

● Submitted extended abstracts must conform to the AIAA template for conference papers: https://www.aiaa.org/events-learning/events/Technical-Presenter-Resources
● Extended abstracts must have a minimum of 1,000 words but must not exceed 25 pages in length.
● Additionally, the extended abstract should be considered a preliminary draft of the conference paper and *should contain sufficient results such that it can be presented with little to no additional content.*
● Authors should follow the below guidelines regarding the contents of the extended abstract.
  ○ **Abstract:** The extended abstract must begin with a 100-200 word abstract.
  ○ **Introduction:** This must be followed by an introduction section that provides the background/context for the paper, a brief assessment of prior work by others, and an explanation of the paper's main contributions.
  ○ **Technical sections:** Appropriately titled technical sections should be included that provide sufficient details on the methodology or technical approach. ■ Authors should provide as much relevant information as possible/available to allow reviewers to make an informed evaluation of the extended abstract.
    ■ Relevant figures, diagrams, or flowcharts that aid in understanding the technical approach are strongly encouraged.
    ■ Preliminary results are expected in the extended abstract and should be of sufficient quality to be presented with little to no additional content.
    ■ Authors should describe what additional work is required to finalize the manuscript, and the timeline by which this work is anticipated to be completed.

○ **References:** A list of references used by the authors or relevant to the proposed work must be provided. All such references must be cited in the extended abstract.

FDTC Review Guidelines   6 March 2023

- Abstracts with scores in one or more red boxes will be rejected regardless of scores in any other major or sub-category

	Poor	Below Average	Average	Above Average	Excellent
Technical Quality *How strong/deep is the technical content of the abstract?*					
Accuracy (40%)	Multiple errors in the equations, claims, tables, or figures		Minor errors in equations, claims, tables, or figures		No obvious errors in equations, claims, tables, or figures
References (20%)	Pervasive lack of appropriate citations in the technical literature to support claims made in abstract		Majority of claims supported by data or cited literature		All claims supported by references cited or new data
Technical Challenges (40%)	Author does not demonstrate an understanding of the technical challenges		Obvious technical challenges are clearly identified and addressed		All technical challenges are clearly identified and addressed
Importance/Relevance to Field *How important is the (proposed) scientific advancement to science and the aerospace community?*					
Motivation (40%)	Abstract does not motivate work		Motivation present		Clear and well-articulated motivation
Interest (60%)	Little to no new or significant scientific content of interest to the field		Topic of interest to government, industry, or academia		Topic of wide interest to government, industry, AND academia
Originality *How novel is the (proposed) scientific advancement?*					
Knowledge Advancement (50%)	Abstract does not advance knowledge in the field		Abstract advances prior work by the authors		Abstract synthesizes work from multiple research groups to produce a novel advancement
Methodology/Analysis (50%)	Work conducted with standard methods without significant change in technical approach or interpretation		Non-trivial technical approach or interpretation of technical results		A clear paradigm shift with respect to new results or a novel method
Conciseness/Style/Clarity *How easy is it to extract information from the abstract?*					
Grammar/Spelling (40%)	Persistent grammar/spelling errors		Minor grammar/spelling errors		No grammar/spelling errors
Formatting/Narrative (60%)	No attempt to follow AIAA template. No coherent narrative.		Major template sections present. Readable abstract with occasional inconsistencies in evenness of writing.		No formatting issues. Results presented clearly and succinctly.
Potential to be a Good Paper *How complete is the abstract compared to the full paper?*					
Results (60%)	No new results		Preliminary results included		Completed results included
Work to Complete Manuscript (40%)	Work to complete manuscript not defined or not achievable in available timeframe		Clearly defined and achievable goals for final manuscript		Abstract nearly represents completed paper

AIAA Fluid Dynamics Technical Committee

Professor Kirti "Karman" Ghia Memorial Award

- **Name of the Award: Professor Kirti "Karman" Ghia Memorial Award**

- **Award Scope:** The Prof. Kirti "Karman" Ghia Memorial Award is presented to an international graduate student studying in the USA, for an innovative approach to computational fluid dynamics that leads to a greater understanding of the flow physics for a problem related to aeronautics or astronautics.

- **Background/History:**
  The Prof. Kirti "Karman" Ghia Memorial Award was established in 2022 to recognize and support international graduate students that make novel contributions to computational fluid dynamics (CFD), which result in a deeper knowledge of the flow physics for a topic in aeronautics or astronautics. The award provides funds for a student each year to present their research at the SciTech Forum and Exposition, to ensure their work reaches a wide audience, to recognize their achievements, and to encourage them in their future career. The award is in honor of the late Professor Kirti "Karman" Ghia, who was a faculty member in the Department of Aerospace Engineering and Engineering Mechanics at the University of Cincinnati for 47 years; Prof. Ghia passed away in 2017. Prof. Ghia was strongly focused on student mentoring and teaching, and made several lasting contributions to the field of CFD. The latter include creating benchmark cases used widely by the community, and innovations in high-performance computing including parallelization, always with an aim toward providing a better understanding of the flow physics.

- **Selection Committee:**
  The Award Subcommittee of the AIAA Fluid Dynamics Technical Committee (FDTC) is responsible for selection of the Prof. Kirti "Karman" Ghia Memorial Award winner. The Fluid Dynamics Award Subcommittee consists of the Award Subcommittee Chair and four (4) additional members of the FDTC as designated by the FDTC Chair. Nominees may not be involved in the evaluation of the nominees or the selection of the award recipient. After review, the Awards Subcommittee Chair presents the nominee selected by the

subcommittee to the FDTC Chair, and after approval submits the nomination via the AIAA Open Water website.

- **Constituency:**
The Award is for international students studying in the USA who are presenting papers at the SciTech Forum and Exposition, specifically in Fluid Dynamics and with CFD as a part of their research. The winner must show some written proof, potentially from their departmental graduate office, that they are an international graduate student studying in the USA. *The size of this group annually is unknown at the start of this award. Over the first few years, data will be gathered and then a reprsentative number will be reported.*

- **Administration:**
The administration of the Prof. Kirti "Karman" Ghia Memorial Award resides at both the FDTC and the AIAA Foundation.

- **Frequency:**
The Prof. Kirti "Karman" Ghia Memorial Award is conferred annually.

- **Candidate Qualifications:**
AIAA membership is strongly encouraged but not required. Nominees must be international graduate students, meaning that they do not have USA citizenship or permanent residency, who are working toward a graduate degree in the USA. Nominees are only allowed to win the Prof. Kirti "Karman" Ghia Memorial Award once and cannot be considered again. Nominees must self-identify by checking a box to be considered for this award, as part of the SciTech paper submission process (this check-box option will be incorporated into the SciTech 2024 submission process, with extended abstracts due June 1, 2023). Only nominees who choose a topic area under Fluid Dynamics at the time of submission will be considered for the award, and further only those who have a substantial CFD component as part of their submitted paper.

- **Type of Accomplishment:**
The Prof. Kirti "Karman" Ghia Memorial Award is based on a review of the nominee's extended abstract (first review round) then a review of their full conference paper (second review round) submitted to the SciTech Forum and Exposition, as detailed below.

- **Cash Prize or Endowment:**
  $1,500 is provided annually for the winner's conference costs, including airfare, registration, lodging, food, and other transportation, to present a paper at the AIAA SciTech Forum and Exposition. This amount will be provided as a check to the winner *before* the conference to help them plan and pay for their travel. The winner is required to make their own travel and conference arrangements. An initial $50,000 donation to the AIAA Foundation ensures the continuation of the award. The FDTC will have no involvement in the financial aspects of the award.

- ## Judging Nominations

  As described above, nominees self-identify to be considered for the Prof. Kirti "Karman" Ghia Memorial Award by checking a box upon submitting their SciTech paper. The Award Subcommittee Chair will work with AIAA and the FDTC SciTech organizers to obtain the nominations and their extended abstracts.

  The Award Subcommittee Chair will distribute the nominations and extended abstracts to the other members of the subcommittee for review (first review round). If the number of extended abstracts is large, the Award Subcommittee can solicit other reviewers from the FDTC as needed. The nominated extended abstracts will then be scored based on the criteria below. From this first down-selection stage, a subset of nominees will be asked to submit full papers to be considered for the award, to be submitted well before the official SciTech paper deadline to allow time for judging (second review round). This second review stage, using the same judging criteria, will result in a single winner being chosen for the Prof. Kirti "Karman" Ghia Memorial Award. The outcome from the scoring of the nominated papers, along with the paper of the winner, will be sent to the FDTC Chair for approval. If and once approval is given, the Award Subcommittee Chair will submit the winner's information to the AIAA Open Water website. AIAA staff will then inform the award winner via e-mail with the FDTC Chair cc'd. The FDTC Chair will send a congratulatory e-mail, including the details of the award as described above. The timeline and deadlines for this overall process are given below.

  If the award winner does not accept for whatever reason, the next qualified student will be presented with the award, and so on. As discussed below, to ensure the integrity of the award, a winning nominee must achieve a score above the minimum; otherwise, no award is presented that year.

  The Chair of the Fluid Dynamics Award Subcommittee will keep a history of the results of the Subcommittee's evaluation and selections from year to year.

- **Deadlines:**
  - Nomination Deadline: Approximately June 1, students self-nominate when submitting a SciTech paper.
  - First round Awards Subcommittee Review Period: June 1 to July 31 to down-select from submitted abstracts, approximately 6-10 chosen, depending on scores.
  - *The Awards Subcommittee must wait until the FDTC SciTech organizers make paper acceptance decisions based on the extended abstracts (before Aug. 31).* The Awards Subcommittee must inform the SciTech organizers that the acceptance information is needed as early as possible. Then, the Awards Subcommittee Chair communicates with the first-round winners—whose extended abstracts were accepted to move on to full papers—that their submitted papers are due early (Oct. 24) to allow time for judging.
  - Second round Awards Subcommittee Review Period: Oct. 25 to the week before Thanksgiving week (typically 3rd week of Nov.), to choose 1 winner from the selected first-round group.
  - Results from the review and a copy of the winner's paper are sent electronically to the FDTC Chair: 3rd week of Nov.
  - The FDTC Award Subcommittee Chair submits the winner's information to the AIAA Open Water website immediately after the FDTC Chair's approval.
  - AIAA staff informs the award winner: 3rd week of Nov.
  - The FDTC Chair, cc'ing the appropriate AIAA staff, e-mails the winner with the award details.

- **Award Presentation Venue:**
  The Prof. Kirti "Karman" Ghia Memorial Award is presented at the AIAA SciTech Forum and Exposition. The winner will be invited to the FDTC plenary meeting to be recognized and provided with a certificate. The award will also be acknowledged at the Student Breakfast, in coordination with AIAA staff.

- **Criteria:**
  The following criteria form the basis for evaluating nominated papers for this award:
  - Innovative approach to CFD, e.g., a new methodology, speed increase, higher accuracy, new validation framework, post-processing strategy, etc. (weight: 35%).
  - A greater understanding of the flow physics of a given problem, as a result of the CFD innovation (weight: 35%).
  - Clarity and prose (weight: 15%).
  - Graphical content (weight: 15%).

The grading in each category will range from 1 to 5 (5: highest).

Any qualified package must have a total score of at least 3.0. This requirement of a minimum quantitative score associated with the award criteria establishes a merit-worthy threshold to ensure and maintain award technical and "audit trail" integrity. If the minimum score is not obtained by any nominee, then the award will not be given out during that particular award cycle. Allowing for a non-recipient demonstrates the intended significance and persistent quality of the award such that it is not given out to just the best of the non-qualified nominees.

If there is a non-winner, the winning amount for that year can be added to the principle of the donation.

The evaluation criteria must be documented in the FDTC Guidebook.

The qualified package with the highest score will identify the recipient of the Prof. Kirti "Karman" Ghia Memorial Award. The winner's information should also be communicated to Prof. Urmila Ghia or, later in the future, to her next of kin, to let them know the impact the award is having.

Prof. Kirti "Karman" Ghia Memorial Award

- **Award Scope and Qualifications**
  - Commemorating Prof. Ghia's lifelong contribution and education
  - <u>For international graduate students</u> (non-U.S. citizenship) enrolled <u>in U.S. institutions</u>
    - For announcements and additional information, visit the site below (early June)
      - SciTech Website: Call for Content >> Student Paper Competitions >> 'Fluid Dynamics' topic
    - Students must self-nominate when submitting SciTech paper.

- **Selection of the Winner**
  - Two-stage evaluation process: (1) extended abstract, (2) final paper
  - In perspectives of CFD innovation and/or computational analysis of flow physics

- **Prize and Endowment**
  - Award is annually presented at the AIAA SciTech Forum.
  - Up to $1,500 of conference expense is supported.

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POCs

Fluid Dynamics Awards SC
- Dr. Charles E. Tinney (SC chair)
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AIAA Manager
- Ms. Angie Lander
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The late Prof. Ghia

Call for Papers

The AIAA Fluid Dynamics Technical Committee is sponsoring a Special Session on:

Utility of Large Language Models for Fluids (LLM4F)

AIAA SciTech 2027

January 11-15, 2027
Hyatt Regency
Orlando, FL

Large language models (LLMs) and multimodal foundation models are enabling new workflows for fluids and CFD, but questions remain about reliability, evaluation, and best practices. This special session welcomes invited papers on LLM-enabled or agentic pipelines for pre-processing and meshing, solver setup and debugging, post-processing and data reduction, literature and knowledge mining, and integration with verification and validation (V&V) and uncertainty quantification (UQ). We especially encourage submissions that go beyond automation to enable new knowledge discovery—e.g., hypothesis generation, synthesis of multi-source evidence, interpretation of high-fidelity datasets, extraction of governing relationships or reduced-order representations, and identification of gaps in existing physical understanding. We also encourage contributions on reproducible benchmarks and guardrails for trustworthy use, as well as case studies demonstrating measurable impact on productivity or scientific insight.

This is an invited, invitation-only special session. Submissions are by invitation.

Invited speakers: please select the "Utility of Large Language Models for Fluids" topic option under "Fluid Dynamics" during submission.

For more information, please contact the session organizer:

Xiang Yang
xzy48@psu.edu
The Pennsylvania State University

Call for Papers

The AIAA Fluid Dynamics Technical Committee is sponsoring a Special Session on:

Quantum Computing for Fluid Dynamics and Turbulence Modeling (QC4FD)

AIAA SciTech 2027

January 11-15, 2027
Hyatt Regency
Orlando, FL

Quantum computing is emerging as a new paradigm for scientific computing, prompting growing interest in its potential impact on CFD and turbulence modeling. This special session solicits contributions on quantum and hybrid quantum-classical approaches relevant to fluid dynamics, including algorithms for discretized PDEs and linear systems, quantum-enhanced optimization and uncertainty quantification, error mitigation and verification, software toolchains, and benchmarking studies that quantify accuracy and scaling. We also encourage topics at the intersection of quantum computing and turbulence modeling, such as closure calibration and uncertainty quantification, data-driven model discovery, and turbulence modeling. Application-oriented papers that connect quantum methods to meaningful CFD problems (incompressible, compressible, and multiphysics) are especially encouraged.

This is an invited, invitation-only special session. Submissions are by invitation.

Invited speakers: please select the "Quantum Computing for Fluid Dynamics" topic option under "Fluid Dynamics" during submission.

For more information, please contact the session organizer:

Xiang Yang
xzy48@psu.edu
The Pennsylvania State University

Call for Papers

The AIAA Structural Dynamics and Fluid Dynamics Technical Committees are jointly sponsoring a Special Session on:

Advances in High-Speed Fluid-Thermo-Structural Interaction (FTSI)

AIAA SciTech 2027

January 11-15, 2027
Hyatt Regency
Orlando, FL

Intensive work on High-Speed FTSI modeling and experimentation has been underway by the structural dynamics' international community, leading to collaborative and multidisciplinary research in the area. New research provides insight into the challenges of modeling and capturing FTSI instability mechanisms in different configurations and sparks the discussion on advances in the field and practical applications. This session will highlight recent efforts on investigating the fundamental physics of FTSI in the supersonic and hypersonic flow regimes using computational modeling and experimental tests to support the design of high-speed aerospace vehicles. The committee welcomes submissions from industry, government, academia, and small businesses.

Make sure to select the "Advances in High-Speed Fluid-Thermo-Structural Interaction" topic option under "Structural Dynamics" or "Fluid Dynamics" during submission.

For more information, please contact the session organizer:

Luisa Piccolo Serafim
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ATA Engineering

Call for Papers

The AIAA Fluid Dynamics Technical Committee is sponsoring a Special Session on:

Computational Electromagnetics for Aerospace Applications (Oral Only, Joint MVCE/FD)

AIAA SciTech 2027

January 11-15, 2027
Hyatt Regency Orlando
Orlando, FL

The numerical simulation of electromagnetics phenomena has become increasingly relevant for aerospace applications, such as antenna design, radar cross sections, electromagnetic compatibility, and component design. These simulations employ finite differences, finite elements, boundary elements, spectral methods, and other techniques. Topics of interest for this session include, but are not limited to, advances in computational electromagnetics algorithms, credibility (verification, validation, and uncertainty quantification) of electromagnetics simulations, and novel applications of computational electromagnetics.

For more information, please contact the session organizers: Daniel Faircloth (daniel.faircloth@nullspaceinc.com), Masha Petrova (masha.petrova@nullspaceinc.com), and Brian Freno (bafreno@sandia.gov).

Please select the "Computational Electromagnetics for Aerospace Applications (Oral Only, Joint MVCE/FD)" sub-topic under "Meshing, Visualization, and Computational Environments" or "Fluid Dynamics" during submission.

Call for Papers

The AIAA Fluid Dynamics Technical Committee is sponsoring a Special Session on:

Verification Techniques in Computational Physics
(Oral Only, FD/MVCE/NDA)

AIAA SciTech 2027

January 11-15, 2027
Hyatt Regency Orlando
Orlando, FL

In computational physics codes, verification and validation of the implementation and suitability of the governing equations are necessary to develop confidence in the credibility of the simulations. Verification assesses the accuracy of the numerical solutions the code produces, relative to the assumptions and expectations associated with the numerical methods.

Verification can be divided into code verification and solution verification. Code verification focuses on the correctness of the numerical-method implementation in the code (numerical-error evaluation), whereas solution verification focuses on numerical-error estimation for simulations that do not have an exact solution available. Spatial and temporal discretization are often the primary focus of code verification and are typically checked using manufactured and/or exact solutions and grid/time-refinement studies. On the other hand, grid/time-refinement studies are not the only techniques proposed in the literature to address error estimation. However, most (if not all) of the proposed techniques require data in the so-called 'asymptotic range'. Such a requirement makes solution verification troublesome in practical calculations.

Topics of interest include manufactured solutions, exact solutions, and other code-verification techniques, as well as error-estimation (solution-verification) techniques, for computational physics codes. Physics disciplines are not limited to fluid dynamics.

Please select the "Verification Techniques in Computational Physics" sub-topic under "Meshing, Visualization, and Computational Environments" or "Fluid Dynamics" during submission.

For more information, please contact the session organizer:

Brian Freno
bafreno@sandia.gov
Fluid Dynamics Technical Committee

Call for Papers

The AIAA Fluid Dynamics Technical Committee is sponsoring two Special Sessions on:

Flow Control and Flight Dynamics in Unsteady Flows – Celebrating David Williams' Retirement

AIAA SciTech 2027

January 11-15, 2027
Hyatt Regency Orlando
Orlando, FL

The thrust toward integrating flow control, flight dynamics, aircraft design, and unsteady aerodynamics is driving new actuation technologies, design strategies, and in-depth explorations of wing-gust interactions coupled with controls. Experiments, computational simulations, modeling, and flight tests currently underway by these communities are fostering discussions and cultivating collaborations across multiple disciplines. These special sessions will highlight recent experimental, computational, and modeling efforts on the fundamental physics and novel applications of flow and flight control for vehicles subject to complex dynamics or unsteady environments. The invited sessions will also celebrate David Williams' retirement from the Illinois Institute of Technology and recognize his pioneering and longstanding contribution to the flow control community. The committee welcomes both paper and oral-only submissions from industry, government, academia, and small businesses.

Make sure to select the "Flow Control and Flight Dynamics in Unsteady Flows" topic option under "Applied Aerodynamics" or "Fluid Dynamics" during submission.

For more information, please contact the session organizers:

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University of Utah