



## CALL FOR PAPERS

### Space Flight Mechanics Meeting

Manchester Grand Hyatt, San Diego, CA

**ABSTRACT DEADLINE: 01 June 2021**

The conference is organized by the American Institute of Aeronautics and Astronautics (AIAA) Astrodynamics Technical Committee and co-sponsored by the American Astronautical Society (AAS) Space Flight Mechanics Committee. Manuscripts are solicited on topics related to space flight mechanics and astrodynamics, including but not limited to:

- Artificial intelligence and machine learning for astrodynamics
- Attitude dynamics, determination, and control
- Dynamical systems theory, perturbations, and stability
- Dynamics and control of large space structures and tethers
- Earth and non-Earth space missions
- Large-scale astrodynamics, design, analysis, and optimization of very large constellations
- Orbit determination and space surveillance tracking
- Rendezvous, relative motion, proximity missions, and formation flying
- Space Situational Awareness, Conjunction Analysis, and collision avoidance (**Joint Track with GN&C**)
- Trajectory design and optimization

Manuscripts will be accepted based on the quality, originality, and anticipated interest in the proposed subject. Submissions highlighting novel high-performance computing techniques and submissions reporting experimental results, current data, or ongoing missions are especially encouraged. Complete manuscripts are required before the conference. English is the working language for the conference. Up-to-date information can be found at the conference website <https://www.aiaa.org/scitech/>, where abstracts and manuscripts can be submitted via the *Presentations & Papers* link.

### SPECIAL SESSIONS

Proposals are being considered for suitable special sessions, such as topical panel discussions, invited sessions, workshops, mini-symposia, and technology demonstrations. Prospective special session organizers should submit their proposals to the Technical Chairs well before the abstract deadline.

### SPACE SITUATIONAL AWARENESS JOINT TRACK WITH GN&C

This joint track, co-hosted by the GN&C and Astrodynamics Technical Committees, invites papers on guidance, navigation and control methods for Space Situational Awareness (SSA). In particular, papers that address machine learning techniques for SSA, low observability scenarios, novel sensing architectures and techniques are encouraged. Also sought are papers pertaining to advancements in uncertainty quantification methods for conjunction assessment, and controlled debris removal. **Submission to the joint track requires adherence to the GN&C requirement of a full draft manuscript, which must include sufficient detail to allow informed evaluation by the assigned reviewers.** Extended abstracts will be returned without review. Full draft manuscripts must not exceed a total length of 15 pages, formatted in accordance with the AIAA SciTech manuscript template.

Examples of specific topics for this joint track include the following:

- Machine Learning Applications for SSA: Data-driven learning methods for orbit determination, association, object detection and intent characterization in high noise/low observability situations
- Novel Tracking algorithms: Forecasting, information fusion and novel sensor integration. Advancements in electro-optical sensing techniques, object detection and recognition, material characterization, event-based sensing

- Resource allocation: Collaborative sensing, scalable sensor tasking, data-driven/learning/deep-learning methods for autonomous dynamic sensor tasking, scalable integration with classical techniques such as Markov decision processes
- Conjunction assessment, threat mitigation: Novel methods for trustworthy uncertainty forecasting and computation of probability of collision, metrics for safety and risk assessment
- Novel deorbiting techniques and debris removal: Controlled removal of orbital debris, non-propulsive techniques for removal, end of life satellite disposal, debris proximity operations, evasive maneuvers

## INFORMATION FOR AUTHORS

The submission deadline of 01 June 2021 has been fully extended for the convenience of contributors and there are no plans to defer it. Notification of acceptance and detailed author instructions will be sent via email by 12 July 2021. The author affirms that any submissions have not been previously presented or published elsewhere.

Authors may access the web-based submittal system using the link available via the official website <https://www.aiaa.org/scitech/>. Unless submitting to the SSA Joint Track with GN&C (in which case authors must submit a full draft manuscript, as explained above) authors are expected to provide:

1. Paper title, name, affiliation, address, telephone number, and email of the corresponding author and each co-author
2. Extended abstract in Portable Document Format (PDF) containing at least 1,000 words (including title and authors) and providing a concise problem statement, proposed method of solution, expected or obtained result, and assessment of the significance to astrodynamics and space-flight mechanics. Pertinent references and supporting tables and figures should be included as necessary
3. Condensed, 100-word abstract directly typed into the text box provided on the web page

Foreign contributors requiring an official letter of acceptance for a visa application should contact the Technical Chairs by email at their earliest opportunity.

**Technology Transfer Notice** - Technology transfer guidelines substantially extend the time required to review abstracts and manuscripts by private enterprises and government agencies. To preclude late submissions and withdrawals, it is the responsibility of the authors to determine the extent of necessary approvals prior to submitting an abstract.

**No-Paper/No-Podium Policy** – A complete manuscript must be electronically uploaded to the web site prior to the conference in PDF format, be no more than twenty pages in length and conform to the AIAA SciTech manuscript template. If a complete manuscript is not received on time, its presentation at the conference shall be forfeited. If a presentation is not made by an author at the conference, the manuscript shall be omitted from published proceedings.

Questions concerning the submission of manuscripts should be addressed to the technical chairs:

### AIAA Technical Chair

Dr. Juan Arrieta  
Nabla Zero Labs  
535 Old Mill Rd.  
San Marino, CA 91108  
[scitech@nablazerolabs.com](mailto:scitech@nablazerolabs.com)

### AAS Technical Chair

Dr. Kamesh Subbarao  
The University of Texas at Arlington  
500 W. First St. ELB 254  
Arlington, TX 76019  
[subbarao@uta.edu](mailto:subbarao@uta.edu)

All other questions should be directed to the General Chairs:

### AIAA General Chair

Dr. Renato Zanetti  
The University of Texas at Austin  
1 University Station, C0600  
Austin, TX 78712  
[renato@utexas.edu](mailto:renato@utexas.edu)

### AAS General Chair

Dr. Puneet Singla  
The Pennsylvania State University  
234A Hammond Building  
University Park, PA 16802  
[psingla@psu.edu](mailto:psingla@psu.edu)