48th ANNUAL AAS GUIDANCE & CONTROL CONFERENCE

<div style="background:blue;color:white;text-align:center;">

January 30 – February 4, 2026
Sponsored by the American Astronautical Society
Rocky Mountain Section

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Please see our website: http://aas-rocky-mountain-section.org/ *to submit an abstract or to obtain additional information about the Conference*

For additional questions, please contact the Conference Chairperson:
Stephen Lutgring, BAE Systems, Inc., stephen.lutgring@baesystems.us

**Paper and Poster Abstracts are due September 8, 2025
(Submit through the AAS GN&C Conference website)**

TENTATIVE CONFERENCE AGENDA

Registration
Room check-available at the Beaver Run Resort front lobby.
Conference registration 6:30 AM to 10:00 AM and 4:00 PM to 6:00 PM daily at the Conference Center.

Buffet Breakfast Daily from 6:00AM – 9:00AM (Saturday Jan. 31st – Wed. Feb. 4th)

Thursday January 29, 2026
8:30 AM – 4:30 PM   Classified Session (Raytheon Facility, Aurora, CO)

Friday January 30, 2026
8:30 AM – 12:30 PM   Classified Session (Raytheon Facility, Aurora, CO)
6:00 PM – 9:00 PM   Conference Opening Reception (Beaver Run Resort, Breckenridge, CO)

Saturday January 31, 2026
7:00 AM – 10:00 AM   Technical Sessions
10:30 AM – 4:30 PM   STEMScape Educational Event
5:00 PM – 8:00 PM   Technical Exhibits

Sunday February 1, 2026
7:00 AM – 10:00 AM   Technical Sessions
8:30 AM – 9:00 AM   Focused Poster Session
11:00 AM – 3:30 PM   Tutorial Session
4:00 PM – 7:00 PM   Technical Sessions
7:30 PM – 9:30 PM   Social Hour/Casino Night

Monday February 2, 2026
7:00 AM – 10:00 AM   Technical Sessions
8:30 AM – 9:00 AM   Focused Poster Session
10:30 AM – 3:30 PM   Tutorial Session
4:00 PM – 6:00 PM   Technical Sessions
6:15 PM – 7:30 PM   Industry Panel Discussion & Cocktail Hour

Tuesday February 3, 2026
7:00 AM – 10:00 AM   Technical Sessions
10:30 AM – 3:30 PM   Tutorial Session
4:00 PM – 7:00 PM   Technical Sessions

Wednesday February 4, 2026
7:00 AM – 10:00 AM   Technical Sessions

MAIN CONFERENCE SESSION INFORMATION

Conference Registration and Welcome Reception

Friday January 30, 2026 from 6:00-9:00 PM
Beaver Run Conference Center, Breckenridge, CO

The Conference Welcome Reception will be held in the Imperial Ballroom at the Beaver Run Resort in Breckenridge on Friday evening. This will be an opportunity to learn more details about the specifics of the planned program, meet new colleagues and renew connections with old friends. Early conference registration will be available from 6:00 PM to 9:00 PM in the Conference Center.

Conference Technical Session Topics

Saturday January 31 – Wednesday February 4, 2026
Beaver Run Conference Center, Breckenridge, CO

(Session Schedule To Be Announced)

The conference sessions will be scheduled from Saturday, January 31st at 7:00 AM to Wednesday, February 4th at 10:00 AM. The final agenda will be available in the Fall of 2025. Tutorial sessions will be scheduled in between the technical sessions on Sunday, Monday and Tuesday. The following technical sessions are being planned for the 2026 conference.

CLASSIFIED SESSION INFORMATION

Thursday January 29 – Friday January 30, 2026
Raytheon, Aurora, CO

The classified sessions will be held at Raytheon facility located in Aurora, Colorado on January 29-30, 2026. All eligible conference participants may attend the classified presentations.

Attendees must be US-citizens and must possess the necessary clearances prior to registration.
Registration deadline (specific to the classified session) of January 22nd to allow processing time

Pre-registration is required and will be controlled (walk-ins will NOT be admitted). Questions on clearance requirements or steps on submitting an abstract should be directed to:
aas_special_session@lists.aerospace.org

Location of Classified Session: Raytheon, Aurora, CO

Technical Exhibits

THEME: The Technical Exhibits Session is a unique opportunity to observe displays and demonstrations of state-of-the-art hardware, design and analysis tools, and services applicable to advancement of guidance, navigation, and control technology. The latest commercial tools for GN&C simulations, analysis, and graphical displays are demonstrated in a hands-on interactive environment, and include lessons learned and undocumented features. Associated papers not presented in other sessions are also provided and can be discussed with the author. Come enjoy and excellent complimentary buffet and interact with the technical representatives and authors. This session takes place in a social setting and family members are welcome!

Organizers
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Kristina Forystek, Innovation RM, kristina@innovationrm.com

Advances in GN&C Hardware

THEME: Many programs depend on heritage hardware, but the future is advanced by those willing to design and implement new and novel architectures, technologies, and algorithms to solve GN&C problems. This session is open to papers with topics ranging from theoretical technologies to innovative solutions using existing hardware technologies. These hardware technologies typically involve GN&C sensors or actuators that will advance the state of the art, reduce the cost of applications, and speed the convergence to hardware, numerical or design trade solutions.

Organizers
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National Chairpersons
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Advances in Navigation

THEME: Advances in Position, Navigation, and Timing (PNT) seek to push the boundaries of spacecraft navigation and timing technology. Proliferation of large-scale constellation deployments in Earth orbit and the need for maintaining a safe orbital environment for all operators require new PNT techniques and robust architectures to complement the existing ground based and GNSS systems. Lunar, interplanetary, and interstellar mission concepts require novel ways for collecting and processing observations from non-traditional sources. In this session, we explore novel and advanced ground-based, space-based, and autonomous spacecraft PNT approaches. Of particular interest are methods for inter-satellite navigation, lost-in-space scenarios, and new filtering techniques for processing radio and optical observations, pulsar observations, and other deep space signals of opportunity. Expanded lunar exploration and long term habitation requires new techniques, algorithms, and technology to enable in-situ autonomous navigation in cislunar space. Proposals for deployment of a lunar-centric time reference are driven by a need to understand how this timing implementation will impact navigation design in terms of time transfers, stability characterization, and development of timing standards that enable an integrated PNT capability. It also remains important to understand how these approaches and solutions scale or evolve to support more complex Mars missions, including transit, landing, and surface operations.

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Advances in Propulsion

THEME: The development of advanced propulsion technologies is critical for enabling spacecraft platforms ranging from CubeSats to ambitious human and robotic space exploration missions. Innovative developments in chemical, electric, nuclear, and propellantless propulsion will provide higher performance and greater operability, enabling new approaches ranging from launch to interstellar travel. This session will highlight advanced propulsion technologies and enabling subsystems matured by NASA, DOD, industry, and academia.

Organizers
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National Chairpersons
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Advances in GN&C Software

THEME: Successful GN&C system performance is often dependent on innovative algorithms and software. This session is open to all development processes and systems ranging from vehicle code used to operate the spacecraft system, novel algorithms, ground software used for operations/analysis, or simulations/frameworks used to test, validate, or develop GN&C systems. The intent is to include current best practices as well as challenges in future software development.

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Autonomy in GN&C

THEME: Satellite constellations are nothing new, but the sizes, scales, and configurations of modern Distributed Satellite Systems (DSS) are reaching unprecedented levels of scope and complexity. These configurations include constellations, swarms, and various fractionated architectures. Recent demonstrations of these DSS systems show that handling the planning, coordination and operations associated with large-scale constellations is a critical logistical problem that must be addressed for continued effective application of these systems. In addition to the logistical challenges, large and small multi-spacecraft systems must also work through autonomous operational complexities such as formation flying, fractionation, docking, structural assembly, tethering, station keeping for sparse aperture configurations and on-orbit servicing and reconfiguration. Some key system and subsystem challenges for autonomous operations include resource management, health management, task management and decision making, formation control, rendezvous management, expanded autonomous control, on-orbit calibration, station keeping, space traffic management, and human-interfaces. All these topics have a direct impact on GN&C and must be considered when architecting the GN&C system. All papers related to these topics are welcome.

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Control, Mitigation, and Management of Liquid Propellant Dynamics

THEME: Predicting, managing, and controlling space vehicle liquid propellant dynamics continues to present broad-reaching challenges in physics-based modeling, computational methods, control theory, and systems engineering. Emerging concepts in space access, including launch systems, planetary landers, and novel spacecraft are challenged to reduce traditional mass penalties like baffles and vanes while configurations evolve toward increasing propellant mass fractions. The use of cryogens in high-performance designs adds further complications, as thermal management, propellant settling, and GN&C requirements intersect. This session explores advances in slosh modeling and slosh suppression in both microgravity and high-g flow regimes, particularly in the context of vehicle dynamics, test-based or semi-empirical methods, vehicle-CFD co-simulation, and novel techniques for sensing, estimation, and/or control of liquid motion. In addition, efforts to verify and validate dynamic models are of particular interest given the unique scaling challenges between ground test capability and the flight environment.

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Entry, Descent & Landing GN&C

THEME: Entry, descent, and landing technologies enable surface exploration of celestial bodies and the safe return of payloads to Earth. Recent advances in powered flight guidance and in atmospheric entry systems have improved landed mass capability to the Moon and Mars, and has made the reuse of launch vehicle first stages commonplace on Earth. Continued advancements through the collaboration of government, industry, and academia will enable even more ambitious capabilities and missions in the future. This session provides a venue for discussing advanced entry vehicles, as well as guidance, navigation and control technologies for powered and unpowered descent and landing systems. Topics include precision navigation and targeting, novel guidance and control methodologies, hazard avoidance, and controlled landings.

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GN&C Verification and Validation

THEME: Guidance, Navigation, and Control (GNC) of aerospace systems is growing more complex as mission demands for improved performance and autonomy become more of the norm. The Verification and Validation (V&V) process is perhaps the most costly and lengthy element of a GNC system development life cycle. Consequently, there is a need for innovative, rigorous and efficient V&V processes for the anticipated advanced GNC algorithms.

Abstracts are sought in the following specific areas: modernized fast and efficient GNC V&V approaches, methods, and techniques; Artificial Intelligence-based (e.g., Machine Learning) approaches for GNC V&V; advanced sensitivity and robustness analysis methods and techniques; optimization-based approaches for both standard and probabilistic robustness metrics (for not only performance but stability metrics as well); techniques for extracting complementary information from robustness and sensitivity analysis; fast and efficient sample-based sensitivity analysis techniques; model reduction methods and techniques through sensitivity analysis; uncertainty quantification in spacecraft dynamics systems modelling; potential 'spin-in' GNC V&V approaches, methods, and techniques from the non-space domain (e.g., autonomous air, terrestrial, and underseas vehicles) that could become steps on a V&V technology development roadmap for space-domain applications; educational and training approaches for GNC V&V to improve the awareness and preparedness of the industrial workforce; lessons learned from past missions; and real-world benchmark problems the GNC community of practice can use to demonstrate the application of new and emerging V&V methods and techniques for advanced GNC algorithms.

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Image Processing for Spaceborne Navigation

THEME: Image Processing (IP) is a critical step in many GN&C and ADCS algorithms, including attitude determination from star cameras and optical navigation from imaging sensors. Applications occur in various mission phases including interplanetary cruise, planetary orbit, proximity operations, descent and landing, and surface operations. An image from a visible, IR, LIDAR, or similar sensor can offer a wealth of information about a space vehicle's navigation state, but this information must be distilled into measurements that can be ingested by a navigation algorithm. Therefore, the success of algorithms which rely on image data depends on how effectively these algorithms perform IP---defined here as the process of extracting the salient pieces of information from an image in the presence of noise, clutter, and other real-world issues. This session is dedicated to papers that explore the relationship between IP algorithms and the broader problem of GN&C. Topics include IP algorithms; feedback/ feedforward between IP and GN&C; uncertainty quantification of IP outputs, processing of IP outputs to improve navigation, hosting platforms/architectures between CPUs, FPGAs, GPUs, and other processing units; IP techniques base on AI and ML; challenges with on-board real-time IP; on-board rendering; testing, verification, and validation of IP algorithms; and lessons learned from past experiences.

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In Space Manufacturing

THEME: In-space manufacturing (ISM) is reshaping how we design, build, and sustain space systems by moving production from Earth's factories to the microgravity environments of orbit, cislunar space, and planetary surfaces. Additive and subtractive processes, autonomous robotic assembly, modular construction, and in-situ resource utilization are already demonstrating the ability to fabricate large, mission-tailored structures, repair or upgrade spacecraft on demand, and close critical supply-chain gaps for long-duration exploration. Coordinated advances by government, industry, and academia promise lighter launch requirements, adaptive architectures, and true on-orbit lifecycle management. This session provides a forum for emerging concepts, flight demonstrations, and enabling Guidance, Navigation, and Control (GN&C) technologies that make ISM practical. Topics include precision metrology and navigation for free-flying manipulators, coordinated control of multi-agent assembly swarms, adaptive guidance to accommodate changing mass properties, and structural-dynamic or thermo-elastic effects that directly impact attitude control or pointing stability.

Organizers
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New Space and Cislunar Exploration

THEME: In recent years, the exploration and habitation of the Moon and other extraterrestrial bodies has become increasingly popularized in the government, academic, and commercial aerospace communities. The exploration, development, and settlement of these bodies requires substantially more innovation in GN&C technologies beyond what is currently used in Earth's orbit. The challenges in this domain often require technological advances from a diverse set of sub-fields such as space flight GN&C, landing, autonomous surface operations, human-machine interfaces, and many others. This session focuses on such innovation, describing the challenges and solutions developed within the community.

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Pioneers in GN&C

THEME: Image This session will be reflections on the experiences of technologists who pioneered technology solutions in the Aerospace community from sounding rockets through human space flight to today's commercial applications.

Organizers
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National Chairpersons
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Recent Experiences

THEME: This session focuses on recent experiences in spaceflight GN&C, providing a forum to share insights gained through successes and failures. Discussions typically include GN&C experiences ranging from Earth orbiters to interplanetary spacecraft. This session is a traditional part of the conference and has shown to be most interesting and informative.

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RPOD, Guidance/Targeting and Trajectory Design

THEME: Autonomous rendezvous, proximity operations, and docking (RPOD) systems are key enablers to supporting objectives such as commercial servicing of existing spacecraft, orbital debris removal, on-orbit refueling, the next generation of space tugs and asteroid missions, or returning humans to the moon to establish a sustained presence. As many of our missions recently are going beyond low-earth orbit, the need to minimize propellant usage or time to rendezvous has generated new and exciting trajectories and guidance/targeting algorithms. This session explores aspects of enabling technologies for guidance and targeting, optimal trajectory design, control, and safety of flight to support this class of mission.

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National Chairpersons:
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RPOD, Relative Navigation and State Estimation

THEME: Autonomous rendezvous, proximity operations, and docking (RPOD) systems are key enablers for many different types of spacecraft and missions including commercial servicing of existing spacecraft, orbital debris removal, on-orbit refueling, the next generation of space tugs and asteroid missions, or returning humans to the moon to establish a sustained presence. Some would say the heart of the GN&C system required for supporting these RPOD missions is the N: or relative navigation and state estimation. Many design challenges of spacecraft development, such as the need to minimize mass and volume, as well as computational footprint, has generated new, exciting, and innovative solutions to the relative navigation problem. This session explores aspects of enabling technologies for relative navigation, state estimation, and computer vision to support this class of mission.

Organizers
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National Chairpersons:
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Small Body Exploration

THEME: Recent years have witnessed a remarkable surge in the landscape of planetary exploration missions to asteroids, comets, and other small solar system objects, with several new endeavors currently underway. This surge has driven significant advancements and innovations in the practical application of optical navigation, sensors, modeling, and autonomy that are essential to accomplish demanding mission objectives. From intricate task of characterizing a small body post-arrival to complexities of operating in a micro-gravity environment, and in some cases executing surface navigation, these tasks are at the core of such missions. This session solicits contributions showcasing GN&C experiences, successes, lessons learned, and future challenges associated with the exploration of asteroids, comets, and other small bodies.

Organizers
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National Chairpersons
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Small Satellite GN&C

THEME: As small satellites, including CubeSats, NanoSats, and ESPA-class platforms, take on increasingly complex roles in defense, science, and commercial missions, advancements in Guidance, Navigation, and Control (GN&C) are critical to enabling precision, autonomy, and mission success. This session invites contributions on the design, testing, and implementation of GN&C systems for small spacecraft. Topics of interest include precision attitude control, autonomous navigation, fault-tolerant GN&C systems, formation flying, and in-space maneuvering. This may include innovations in onboard sensors and actuators, software algorithms, real-time GN&C processing, and operational concepts that push the boundaries of current smallsat capabilities. Submissions that share lessons learned from flight missions or on-orbit experiments are especially encouraged. Research efforts from students and academic teams working on relevant GN&C challenges are also welcome.

Organizers
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Kenzie Harrison, Blue Canyon Technologies, mharrison@bluecanyontech.com

National Chairpersons
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Student Innovations in GN&C

THEME: This session embraces the wealth of research and innovative projects related to spacecraft GN&C being accomplished in the university setting. Papers in this session address hardware/software research as well as component, system, or simulation advances. Papers submitted must have a student as the primary author and presenter. Papers will be adjudicated based on level of innovation, complexity of problem solved, perceived technical readiness level, applicability and field-ability to near-term systems, clarity of written and verbal delivery, number of completed years of schooling and adherence to delivery schedule. The session will be limited to 8 papers with the top 3 papers receiving monetary awards.

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Using AI/ML in GN&C

THEME: As Guidance, Navigation and Control algorithms become increasingly autonomous, there is a natural progression towards incorporating Artificial Intelligence (AI) and Machine Learning (ML) technologies into the capabilities of today's autonomous systems. When combined with established systems and control theory, AI and ML algorithms can harness the wealth of information available from data obtained by sensors and cyberphysical systems over time. This session will highlight research and demonstrations focused on the theory and methods of learning, control, and computational intelligence for GN&C systems. Some example topics for this session include novel applications of AI systems in traditional GN&C systems, performance comparisons between classical GN&C methods and ones that leverage AI or ML, demonstrations of design and/or test of GN&C systems that utilize ML, and techniques and challenges for the verification and validation (V&V) of systems incorporating these technologies.

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Poster

THEME: Covering a wide variety of unique GN&C topics, this year's interactive Poster session falls on Sunday and Monday during the morning presentation sessions mid-point break. All Posters should be hosted by the author(s) during these two timespans and will include peoples' choice voting by conference attendees and subsequent awards to two winning Posters. Winners of the two categories, Presentation Quality and Material Interest, to be announced at the Monday night social event. Although the Posters will be on display for the full conference, conference attendees are highly encouraged to engage with poster hosts and cast their peoples' choice vote tokens specifically during the Sunday/Monday Poster session breaks.

Organizers
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Note to Authors:

Abstracts are due by September 8, 2025

We will continue to emphasize a 'paperless' method for collecting and distributing papers. Wireless service will be available at the conference.

Please submit paper and poster abstracts through the conference website, http://aas-rocky-mountain-section.org/

Additional conference details are also available on the website