ABOUT THE JNC

The Military Division of the Institute of Navigation will host the 2027 Joint Navigation Conference (JNC 2027) for the U.S. Department of War and the Department of Homeland Security. The theme of this year's conference will be:

Robust, Resilient, Assured PNT for Warfighters and Homeland Security

JNC is the largest U.S. military positioning, navigation, and timing (PNT) conference of the year with joint service and government participation. The event will focus on technical advances in PNT with emphasis on joint development, testing, and support of resilient PNT systems, logistics, and integration. From an operational perspective, the conference will focus on advances in military applications of GPS; critical strengths and weaknesses of field navigation devices; warfighter PNT requirements and solutions; and navigation warfare.

SESSION ACCESS/CLEARANCE REQUIREMENTS

The USAF MARE JPO will screen entry validation for JNC.

- Technical sessions held at the Northern Kentucky Convention Center on June 7-9 are CUI US-Only.
- The exhibit hall, June 7-9 at the Northern Kentucky Convention Center, will be open to all conference participants, exhibitors, their employees, and related organizations. All materials displayed in the exhibit hall shall be Publicly Releasable After Review.
- The classified session, held June 10 at the Wright-Patterson Air Force Base (WPAFB), (AFIT location), will be presented at the US-Only Secret level.

TECHNICAL PROGRAM COMMITTEE

Military Division Chair: Dr. Keith McDonald, The MITRE Corporation
Military Division Vice Chair: Dr. J.P. Laine, Draper
Immediate Past Chair: Dr. Thomas Powell, The Aerospace Corporation
Program Chair: Chad Pinkelman, NIWC Pacific
Program Vice Chair: Brian Louie, SSC/SYD 831
Tutorials Chair: Dr. Greg Reynolds, Army DEVCOM AvMC

Other Members:

- Jan Anszperger, Draper
- Dr. Thomas Blenk, Army JPEO Armaments and Ammunition
- Connor Brashar, Sandia National Laboratories
- Dr. Jacob Campbell, AFLCMC
- John Del Colliano, Army DEVCOM C5ISR
- Dr. Jeffrey Hebert, AFRL
- Amanda Humphrey, NSWC Crane/SOCOM PM CP
- John Langer, The Aerospace Corporation
- Dr. Anne Le, The Aerospace Corporation
- Dr. Sharon Marroquin, MITRE
- Dr. Sonya McMullen, DoW CIO C3
- Aaron Nascimento, NAVWARSYSCOM
- Dr. Madeleine Naudeau, AFRL
- Michael Orr, USSF
- Dr. Joseph J. Rushanan, MITRE
- David Wolfe, USCG C5ISC

JOURNAL PUBLICATION

JNC presenters are encouraged to write Publicly Releasable After Review technical papers based on their JNC presentations to submit for possible publication in the ION's indexed archival journal, NAVIGATION. Papers may be submitted online at mc.manuscriptcentral.com/navigation.

CONFERENCE PROCEEDINGS

Submitted presentations that are approved for public release (Distribution A) and/or CUI distribution will be released to U.S. citizens who were approved to attend the conference by the USAF MAR JPO in an electronic CUI proceedings 2-4 weeks following the conference.

EXHIBITS

80 companies exhibit annually at JNC, showcasing their products and services. This forum also provides valuable networking opportunities. For more information, visit the Exhibitor Resource Center at ***ion.org/jnc*** or email Kelly VanDermark at ***kvandermark@ion.org***.

ABSTRACT SUBMISSION REQUIREMENTS

All abstracts must be written for public release with intent to present in a Controlled Unclassified Information (CUI) US-Only environment. Start the approval process early, as this can often take several weeks. Abstracts not approved for public release will not be accepted. Note that you must be a citizen of the USA to submit an abstract for CUI US-Only sessions (June 7-9).

To submit an abstract, sign in to the ION Abstract Management Portal (AMP) at *ion.org/abstracts*. If you have not used AMP before, click "Create My Account." Once signed in, click on "JNC" and complete the form by February 3. Late submissions will not be accepted.

Acceptance to the JNC conference is competitive. Abstracts should describe objectives, anticipated or actual results, conclusions, key innovative steps, and the significance of your work. Short abstracts, or submissions missing applicable abstract text, will not be forwarded to the program committee for review.

PRESENTATION REQUIREMENTS

- Sessions will consist of presentations. Unless otherwise noted, all presentations must be approved as CUI US-Only. An electronic copy of your final presentation (typically a PDF) with a signed release form must be received by the ION National Office by June 15 to be included in the CUI US-Only proceedings.
- You must be a citizen of the USA and meet all established security validation requirements by the established deadlines to present at the conference. Additionally, you must provide verification of SECRET CLEARANCE to present in the classified session (June 10).
- All presenters must pay conference registration fees.
- Presenters must attend JNC in person (no virtual presentations) and attend the mandatory Speakers' Breakfast the morning of their presentation.

Failure to meet any of these requirements may result in the cancellation of your presentation from the program. Presenters are encouraged to review the online materials in the JNC Speaker Resource Center.

CONFERENCE ATTENDANCE INFORMATION

The JNC's DTS conference ID is N20150610734

The conference will be hosted in a CUI US-Only environment June 7-9 at the Northern Kentucky Convention Center in Covington, KY (restricted to U.S. government and U.S. government contractors) and a US-Only SECRET session on June 10 at WPAFB (restricted to U.S. government and U.S. government contractors with SECRET CLEARANCE).

Full Conference Registration rates for ION member registrants staying in an official conference hotel, received/paid by April 23, $1,100; after April 23, $1,300. Full Conference Registration includes all technical sessions, exhibit hall access, conference refreshments, and electronic proceedings.

Single-Day Registration for ION member early registrants staying in one of the official conference hotels is $600. Single-day registration rates include sessions only, no proceedings.

Accommodations are available at several area hotels at the prevailing government rate until April 23 or until the hotel block fills, whichever occurs first. Reserve a hotel room at *www.ion.org/jnc*.

EXHIBIT SPACE AND SPONSORSHIPS AVAILABLE

Exhibit space is available at a starting cost of $3,300, and includes one complimentary full-conference registration with each 10'x 10'space. For more information, visit ion.org/jnc or contact Kelly VanDermark at kvandermark@ion.org.

ION THE INSTITUTE OF NAVIGATION
8551 Rixlew Lane, Suite 360
Manassas, Virginia 20109

JNC 50th JOINT NAVIGATION CONFERENCE

June 7–10, 2027
Northern Kentucky Convention Center
Greater Cincinnati Area

Abstracts Due: February 3, 2027

Non-profit
U.S. Postage
PAID
Permit No. 425
Southern, MD

The 50th Meeting of the Largest U.S. Military Positioning, Navigation, and Timing Conference with Joint Service and Government Participation

JOINT NAVIGATION CONFERENCE 2027

Robust, Resilient, Assured PNT for Warfighters and Homeland Security

ION INSTITUTE OF NAVIGATION

JOINT NAVIGATION CONFERENCE 2027

DOD DTS Conference ID: N20150610734

JNC 50th JOINT NAVIGATION CONFERENCE

JUNE 7-10, 2027
Northern Kentucky Convention Center,
Greater Cincinnati Area
(Classified Session at AFIT, WPAFB)
WWW.ION.ORG/JNC

CALL FOR ABSTRACTS

ABSTRACTS DUE FEBRUARY 3, 2027

2027 Joint Navigation Conference: Robust, Resilient, Assured PNT for Warfighters and Homeland Security

ABSTRACTS DUE FEBRUARY 3, 2027

JNC SESSIONS

AI/Machine Learning (ML) for PNT
Using AI/ML techniques to support PNT solutions within devices and systems to improve capabilities for warfighters and military platforms. Novel approaches to provide capabilities for situational understanding, battlefield management and decision-making, PNT system performance, integrity monitoring, and other NAVWAR activities. Improvements to operations from big data methodologies and PNT data fusion between entities.
Chairs: *Dr. Camila Francolin, Draper; Isaac Matthews, MITRE; Marianna Konstantopoulos, C5ISR; and Dr. Renee Yazdi, Canyon Consulting*

Alternative Satellite Navigation (SatNav)
Navigation technologies and techniques to augment and provide resilient alternatives to traditional GNSS, including datalink-based navigation (e.g., comm/nav convergence). Topics include: system design and constellation performance analysis, multi-constellation fusion, and status on alternative SatNav services and user equipment.
Chairs: *Dr. Jeff Hebert, AFRL; and Daniel Elsner, AFLCMC/ESC*

Anti-Jam and Anti-Spoofing Technologies
Signal processing, sensor fusion, and other techniques to mitigate jamming and spoofing of GNSS receiver-based and other RF-based PNT sources. Abstracts may also include novel antenna designs as well as controlled reception pattern antennas and anti-jam antenna systems.
Chairs: *Korede Oladimeji, The Aerospace Corporation; Dr. Brady O'Hanlon, MITRE; Dr. Caroline Waiyaki, DEVCOM/C5ISR; and James Bailey, NIWC Pacific*

Application/Impact of PNT Technologies in the Homeland Critical Infrastructure
The use of PNT technologies in critical infrastructure, with an emphasis on discussing usage, vulnerabilities, and providing mitigating solutions and safeguards against threats to critical infrastructure. The growing use of PNT, along with potential threats and vulnerabilities to critical infrastructure such as the electrical grid, communication, transportation, finance, and emerging infrastructure for domestic employment of UAV systems.
Chairs: *LCDR Adam Hoburg, USCG; and Dr. Chris Erickson, DOT*

Applications of Time Transfer and Dissemination
Warfighter systems rely on Precise Time and Frequency (PT&F) synchronization/syntonization for communication, networking, positioning, etc. These needs are currently supported by GPS or alternative time-keeping systems that consist of high-precision clocks synchronized by time dissemination. This session invites presentations on the use of time transfer/dissemination: time transfer, timescales, timekeeping, synchronization techniques, ranging measurements, and other applications of interest to DoD.
Chairs: *Dr. Frances Bodrucki, C5ISR; and Andy Baster, AFRL*

Complementary or Alternative PNT
Navigation technologies and techniques that replace or supplement traditional GNSS/INS for resilient PNT in degraded or denied GNSS environments. Technologies of interest include but are not limited to: vision-aided navigation for ground and air applications, celestial navigation, non-GNSS RF signals (e.g., signals of opportunity), datalink-based navigation (e.g., comm/nav convergence), and RADAR-based navigation (e.g., terminal seeker navigation approaches, terrain-aided navigation). Map-based PNT, SoOp sensors, and other types of sensors will be considered. Alternative PNT to improve collaborative navigation is also of interest.
Chairs: *Robert McDermott, USCG; Dr. Kevin Brink, AFRL; MAJ Amanda Carpenter, Army; Dr. Adam Schofield, C5ISR; Nicole Hilliard, TrustPoint; and Meghan Bentz, Army*

Future of PNT Equipment for Military Users
Integrating PNT capabilities into existing platforms is complex, costly, and time-consuming, as the MGUE programs have shown. Novel approaches are needed to rapidly and effectively integrate new PNT capabilities into platforms. While MOSA offers potential for capability integration within the receiver, DoW is exploring additional approaches to overcome the platform integration challenge. These approaches include transcoders, enhanced antennas, and hybrid SATCOM-PNT receivers. The focus of this session is the novel approaches to PNT platform integration, beyond traditional MOSA receiver solutions.
Chairs: *Christine Morlock, MITRE; Capt. Sydney Limond, USSF; Col. Jennifer Fuka, USAF; and Charles Frey, Lockheed Martin*

GPS in Military Applications
Integration of GPS into new and existing military systems; precision weapon delivery and military applications in land, sea, air, and space using GPS; and development of new military GPS and auxiliary sensor hardware.
Chairs: *LtCol Stephen Jimenez, OUSW and Nina Faustino, MITRE*

Inertial Navigation Technologies
Promising developments in inertial navigation technology offer significant performance improvements and/or lower size, weight, power, and cost (SWaP-C), expanding military applications. Advancements leading to extremely precise/low SWaP-C inertial navigation devices include the latest developments in cold atom physics, materials processing, device and electronics minimization, manufacturing technologies, new interface standards, component integration, and algorithms.
Chairs: *Ann Witt, Honeywell; Jared Judy, NIWC Atlantic; Dr. Virginia Overstreet, Zeus Research and Technology; and Chris McDowell, Collins Aerospace*

Integrity and Assurance
Integrity/assurance is becoming a principal requirement in all systems to ensure mission success and reduce risks to our warfighters. Achieving integrity/assurance must include the capability to assess sensor inputs, detect anomalous/threat conditions (e.g., leverage anti-jam and anti-spoof methods), and mitigate properly to retain resilience. This session will cover PNT integrity/assurance requirements in various military systems, system functional allocation, algorithm development, design approaches, and a review of performance results from demonstrations.
Chairs: *Lars Brown, NAVSEA 05 and Dr. Jessica Belzer, AFRL*

Magnetic and Gravity Anomaly-Based Navigation
Research, development, implementation, and testing of magnetic- and gravity-anomaly-based navigation (MagNav and GravNav). This includes efforts to overcome key challenges associated with MagNav/GravNav, including: effective use of existing magnetic and gravity anomaly reference data and efficient generation of new reference data; advanced calibration techniques to improve accuracy in all domains (air, maritime, and ground); improved approaches for generation and integration of relative and absolute navigation solutions; and novel magnetic scalar and vector sensors as well as gravimeters. Presentations spanning from theoretical to applied, with test results, are encouraged given the significant investments currently being made in this technology.
Chairs: *Joshua Smak, USCG; Dr. Michael Slocum, AFRL; and Dr. Donnelly Phillips, MITRE*

Military GPS User Equipment and Related Programs
The latest information concerning ongoing programs of record (PoRs) in the area of military PNT user equipment, including standalone satellite navigation receivers and integrated PNT capabilities. Topics will include the status of military PNT user equipment development, test, integration, qualification, and fielding efforts from both contractor and government representatives.
Chairs: *CDR Jacqueline Zimny, USN OPNAV N99; Col. Michael Switzer, USSF; Matt Sanchez, The Aerospace Corporation; LCDR Jennifer Roque, USN PMW/A 520; Kalyn Jones, 746th Test Squadron; and Jon Stanich, USN PMWA/A 520*

Modeling and Simulation
Investigates multiple levels of modeling PNT systems, from subsystem modeling to weapons platform effectiveness modeling. This includes: GNSS, INS, complementary sensor, and filter models capable of assessing advanced algorithms/integrated systems, platforms, environments, and battlefield operations; presentation of hardware-in-the-loop simulation capabilities that use software-defined receiver technology or other active/passive techniques for laboratory evaluation; and interfacing of PNT and mission/campaign modeling, force-on-force, and simulation capabilities for effectiveness modeling for the assessment of the benefits/impacts to warfighters and their commander.
Chairs: *Juan Castro, The Aerospace Corporation; Robert Simsiman, MITRE; Dr. Patricia Larkoski, MITRE; and Avram Tetewsky, Draper*

Multi-GNSS Receivers for Military Applications
Recent technology developments have explored combining military GPS signals with foreign GNSS and commercial GPS signals. The complementary benefits of multi-GNSS include improved accuracy, integrity, availability, frequency diversity, and continued operations in GPS-degraded environments. Military applications require signal assurance and security considerations. Efforts entail concept development, analyses, modeling and simulation, and/or demonstrations. The future of military multi-GNSS receivers includes those that track and use military signals from multiple GNSSs as well as those that combine both military and civil signals from multiple GNSSs. This explores using and integrating additional terrestrial or space-based cooperative signals for timing, ranging, or augmentation with military multi-GNSS receivers.
Chairs: *Joseph Page, JNWC and Dr. Jon Anderson, Canyon Consulting*

Navigation in Challenged Environments (e.g., Urban, Indoor and Subsurface Navigation)
Certain environments (e.g., GPS-denied conditions, high-multipath locations, underground/cavernous environments, poor terrain (mountainous/canyons), or urban/indoor environments) require creative solutions. These solutions often add size, weight, power, and cost (SWaP-C) to systems, which is especially concerning for disadvantaged users (e.g., UAVs, UUVs, UGVs, autonomous UGVs (e.g., robots), missiles, dismounted soldiers, etc.). This session investigates navigating in challenging environments, with particular emphasis on low SWAP-C.
Chairs: *Joe Murray, USN PMWA/A 520 and Mark Smearcheck, AFRL*

Novel Clock Technologies and Timing Applications
Many atomic clock products are designed to balance performance and cost. Development efforts to employ current and novel atomic clock architectures, such as optical transitions, laser cooling, and ion trapping, are underway. These efforts seek to produce rugged high-precision clocks for handheld, infrastructure, aerospace, and space-based applications. This session addresses timing device and system approaches, including advanced clocks and timing applications for military systems.
Chairs: *Dr. Matt Cashen, Vector Atomic and Dr. Arielle Little, The Aerospace Corporation*

Operational Systems and Field Testing: Live Demonstrations
Live demonstration of platforms to support PNT for the warfighter, with particular focus on open architecture solutions which allow incorporation of alternate or revolutionary technologies. Demonstrations may include real-time component demonstration, video of demonstration, and demonstration of SWiL/HWiL. Demonstrations may include, but are not limited to: human-in-the-loop, PNT sensors and algorithms, or novel approaches to address known limitations of current solutions, such as simplified keying solutions, user-friendly interfaces, context-aware energy conservation, field testing, etc. Encouraging demonstrations of technologies at varying stages of technology readiness levels (TRLs 4-6). Demonstrations are 40 minutes long, with traditional presentations limited to no more than 10 minutes and interactive demonstrations used for the rest of the time.
Chairs: *Vi Tran, The Aerospace Corporation and Ernesto Etienne, FAA*

NEW! **PNT Applications for Space Domain Users**
Applications of PNT systems on space platforms for all space domain users, from low Earth orbit (LEO) to cislunar or beyond GEO (XGEO) activities, include navigation services and sensors that support the primary objectives of guidance, navigation, and control (GNC) or bus operations, as well as payload timing functions. This encompasses, but is not limited to, orbit determination; attitude determination; trusted autonomous systems; and application objectives such as space exploration, mapping, lunar resource identification and extraction, situational or domain awareness, and advances in space domain user equipment. This session also covers advances in all enabling technologies applied to PNT space service volume architecture, reference frames, time transfer, timekeeping, service monitoring, sustainment, and resiliency (signals of opportunity, inertial measurement units (IMUs), star trackers, resident space object trackers, etc.).
Chairs: *Daniel DeVargas, USSF and Dr. Joanna Hinks, AFRL*

NEW! **PNT Control Segment and Monitoring**
This session addresses the ground-based architectures, infrastructure, operations, and monitoring capabilities that sustain and assure the performance of PNT space assets. Topics include control segment architecture and modernization efforts, satellite command and control, orbit determination and time synchronization, anomaly detection and resolution, and the monitoring networks used to characterize constellation health and signal performance. Of particular interest are advancements in automation, cybersecurity hardening, and resiliency of control segment operations against evolving threats, as well as efforts to improve situational awareness of space-based PNT assets through monitoring station networks (government and commercial). Presentations may also cover integration of new monitoring techniques to support anomaly characterization, performance reporting, and operational decision-making for GPS and other GNSS/SatNav control segments, along with lessons learned from control segment sustainment, upgrades, and transition activities.
Chairs: *Dr. Anne Le, The Aerospace Corporation and LtCol Michael Clark, USSF MD31*

PNT for Autonomous Systems
Autonomous systems (UxS), such as autonomous air, surface, ground, or subsurface systems, rely heavily on PNT. Recent DoW announcements, such as the standup of an Autonomous Systems Combatant Command, and recent changes in operational theaters demonstrate this priority. UxS systems may operate independently or in collaborative groups, where the PNT of such systems will need to adapt to highly contested environments. Topics of interest include the use of autonomous systems in military environments, the development of PNT solutions for high-volume and attributable platforms, the use of AI and machine learning for full-system autonomy and PNT to solve contested autonomous challenges, collaborative navigation techniques for swarm/collaborative UxS, and mission planning for autonomous vehicles operating through contested environments.
Chairs: *Franz Hamilton, JHU-APL and Dr. Steven Langel, MITRE*

PNT Integration into Platforms
Reports concerning the latest information on PNT platform integration efforts and explores approaches that address challenges associated with platform integration. Platform integration in all domains (air, sea, ground, and space) with particular interest in approaches that address the challenges of competing platform PNT requirements (e.g., rapidly changing requirements to address evolving threats vs. slower-changing, costly-to-implement safety-critical airspace and/or vehicle control requirements). Planned and ongoing platform integration efforts, techniques for platform integrations including MOSA and other open architecture approaches—lessons learned from testing/fielding activities – from both contractor and government representatives.
Chairs: *LCDR Jessica Shapiro, USN PMW/A 520; Justin Last, The Aerospace Corporation; Joe Lortie, Consultant*

PNT Open Systems Architecture
Threats to PNT systems are evolving at increasingly fast rates, driving the need for PNT systems to be adaptable to stay ahead of these threats. Open Systems Architectures (OSA) for PNT can provide frameworks for affordable, adaptable PNT systems. Adaptable PNT systems enable capability insertion, counter threats, and provide resilient solutions. This session covers research, development, procurement, integration, and sustainment of OSA PNT concepts and systems (software, hardware, backplanes, interfaces, etc.), including applications of VICTORY, PNTA, FACE, OMS, SOSA, and more.
Chairs: *Rosalba Puentes, Collins Aerospace; Christopher Colston, AFLCMC; Caroline Hanafin, USN OPNAV N99*

PNT Situational Awareness (PNT-SA)
PNT Situational Awareness (PNT-SA) is the discipline focused on detecting, characterizing, attributing, and geolocating intentional, unintentional, and naturally occurring threats to PNT performance. As platforms become increasingly autonomous and dependent on resilient navigation, PNT-SA plays a critical role in enabling early threat recognition, informing protective measures, and supporting robust decision making across mission contexts.

PNT-SA Sensors: This session seeks presentations that advance next generation PNT-SA through innovations in sensing. Topics of interest include multi modal PNT sensing using repurposed or purpose-built sensors; characterization of sensor error sources; real-time sensor health monitoring; data integrity handling; and AI enhanced feature extraction. This session aims to accelerate fieldable PNT-SA technologies that enhance resilience, autonomy, and mission assurance across future platform architectures.
Chairs: *Connor Brashar, Sandia National Laboratories and Kristin Riesett, KBR*

PNT-SA: Fusion, Estimation, and Visualization
This session seeks presentations that advance next generation PNT-SA through innovations in information generation and visualization. At the information layer, we encourage submissions on advanced filtering and estimation approaches (EKF, UKF, particle filters, AI accelerated variants), fusion architectures for disparate sensors, dynamic confidence and integrity scoring, AI/ML models that improve anomaly detection and representation of PNT-SA uncertainty, M&S tools to integrate and estimate threat laydowns based on limited/sparse PNT-SA information, and human-machine teaming approaches that present PNT-SA effectively to operators and command and control systems. This session aims to accelerate fieldable PNT-SA technologies that enhance resilience, autonomy, and mission assurance across future platform architectures.
Chairs: *Matthew Peretic, MITRE and Kelly Fang, T2COM C5ISR*

PNT-SA: Operations and Mission Planning
This session seeks presentations that advance next generation PNT-SA through innovations in operational integration. For operationalization, we invite presentations addressing integration of PNT-SA into autonomy stacks such as: adaptive vehicle behaviors informed by centralized or distributed PNT-SA cues, AI/ML-driven decision support, mission planning and fail-safe behaviors that react to navigation warfare laydowns, distributed PNT-SA for swarms and multi platform systems, advancements to in-flight target updates or real-time transmission or receipt of PNT-SA information. This session aims to accelerate fieldable PNT-SA technologies that enhance resilience, autonomy, and mission assurance across future platform architectures.
Chair: *Dr. Sharon Marroquin, MITRE*

Precision Guided Munitions PNT Technologies
Precision Guided Munitions experience self-induced and/or naturally occurring harsh environments that require advanced techniques to maintain accuracy and ensure electronics survivability during use. Presentations may address innovative design concepts, challenging performance and environmental requirements, laboratory and flight test results, compensation methods, alignment/initialization techniques, size constraints/miniaturization, and other issues. These include high-dynamic (e.g., hypervelocity) environments, extreme temperatures, spinning systems, high shock, countering plasma effects, radiation hardening, and others.
Chairs: *MAJ John Graham, Combat Ammunition Systems, Army and Greg Panas, L3Harris*

Quantum PNT
Explores the current progress in ruggedization, integration, and fielding of quantum sensors in relevant environments to address PNT missions across the military and intelligence community. This session explores quantum sensors—including advanced gyroscopes, accelerometers, and magnetometers and their PNT performance. Of particular interest is technology demonstrated in operational environments, detailing military utility, concepts of operation, and pathways to deploy these next-generation PNT systems to the warfighter.
Chairs: *Dr. Thanh Tran, NSWC Dahlgren; Dr. Clinton Cahall, InfleQtion; Dr. Kelly Backes, MITRE; and Dr. Chad Hoyt, Honeywell*

Satellite Navigation (SatNav) System Experimentation
Experiment plans and results for SatNav systems other than GPS and GNSS. Systems can be government or commercial endeavors; experiments can be at system or subsystem levels.
Chairs: *Kevin Greco, SAIC; Dr. Brad Snios, MITRE; Dr. Eric Vinande, AFRL; Bryan Hoffman, NIWC Pacific; Greg Myer, The Aerospace Corporation; and Col. Aaron Stephenson, USSF*

Signals of Opportunity (SoOp)
The use of non-cooperative signals of opportunity (SoOp) (e.g., LEO communications satellites, cell towers, or other non-cooperative emitters) as a source of PNT information to support primary or secondary navigation. Topics include: unique and novel applications of signals for PNT, experimentation, use of SoOp in operational environments, and integration challenges and solutions (e.g., multi-band/wideband antenna solutions in small form factor applications, novel ephemeris opportunities and improvements, adaptive algorithms for tracking non-cooperative emitters).
Chairs: *Dr. Michael Esswein, Draper and Eric Bickford, Army*

Space Applications for Cislunar and Beyond
Applications of PNT systems on space platforms for cislunar or beyond GEO (XGEO) activities, including the use of navigation services and sensors to aid primary objectives of guidance, navigation and control (GNC) or bus and payload timing functions. This encompasses, but is not limited to: orbit determination; attitude determination; trusted autonomous systems; and application objectives such as space exploration, mapping, lunar resource identification and extraction, situational or domain awareness, and advances in cislunar user equipment. This session also covers advances in enabling technologies applied to cislunar PNT service volume architecture, reference frames, time transfer, timekeeping, service monitoring, sustainment, and resiliency.
Chairs: *Iris Ma, USSF SYD 831 and Dr. Kimberly Frey, AFRL/RV*

PLENARY SESSION: 2027 Military GPS Enterprise Leaders
The historical model of a single US Air Force-led GPS Joint Program Office/Wing/Directorate has undergone significant change in recent years with the establishment of US Space Force, its organization into Systems and Mission Deltas, and the subsequent transition of military user equipment programs of record to the US Air Force in May 2026. In this session, the Senior Leader of each major segment of GPS will share recent successes and challenges, plans and visions, and new capabilities being developed and delivered to the warfighter in response to rapidly evolving threats.
Panelists: *Col. Neil Barnas, Commander, SSC/SYD 831, USSF; Col. Stephen Hobbs, Commander, MD 31, USSF; and Col. James Locklear, Commander, MARE JPO, USAF*
Moderator: *Dr. Thomas Powell, The Aerospace Corporation*

SECRET PROGRAM: US-ONLY
The classified session, held June 10 at the Air Force Institute of Technology (AFIT), will be presented at the US-Only Secret level. The JNC's 2027 SECRET PROGRAM will be curated by invitation from the JNC Military Division.
Topic Leads: *Dr. Keith McDonald, MITRE and Amanda Humphrey, NSWC Crane/SOCOM PM CP*

PANELS

PANEL: Alternative and Assured Commercial PNT Services
With the proliferation of low- and medium-Earth orbit (LEO/MEO) satellite services, alternative and assured commercial PNT services are becoming more common. This panel will explore alternatives to traditional GNSS, including applications, technical means, performance, service offerings, anticipated service start dates, and shaping services to yield unique military capabilities.
Moderator: *William Joo, Small Business Innovation Research Consortium*

NEW! **PANEL: Autonomous Systems**
As autonomous systems become increasingly prevalent across military, homeland defense, and critical infrastructure missions, their ability to perceive, decide, and act hinges on reliable PNT. Whether operating under supervised autonomy, teaming with human operators, or executing fully independent missions, autonomous platforms rely on PNT to maintain spatial awareness, synchronize behaviors, coordinate across distributed systems, and assure mission integrity. Yet, autonomy also amplifies exposure to PNT threats—environmental, adversarial, and systemic—which can degrade performance, disrupt decision loops, and introduce safety risks. This panel convenes experts from government and industry to explore the core dependencies between autonomy and PNT, the unique challenges autonomous systems face in contested or complex operational environments, and the critical PNT advancements needed to unlock future levels of autonomous capability.
Moderator: *Dr. Thomas Blenk, PAE Agile Sustainment and Ammunition, Army*

PANEL: Field Testing of PNT Technologies
This panel will focus on testing PNT technologies. The discussion will center on the current state of U.S. military field testing, current field-testing best practices and lessons learned from recent testing activities; on testing coordination, connectivity, and increased communication across test consumers, providers, hosts, and sites, promoting a common testing and training language and lexicon; and a discussion of tools, capabilities, existing and emerging policies, and upcoming testing and training events.
Moderator: *Dr. Jimmie Davis, MITRE*

PANEL: MGUE Integration
M-Code is the greatest advance in military PNT since the Global Positioning System (GPS) reached initial operational capability (IOC) in 1993. M-Code ground-embedded receivers became available for purchase in 2022, and Aviation/Maritime receivers in 2024. This panel will feature representatives from both the U.S. government and U.S. industry involved with integrating these products. Panelists will share their experience and lessons learned working with the new M-Code receivers.
Moderator: *Lt Col. Matthew Getts, MAR JPO, USAF*

PANEL: Signals of Opportunity
This panel will address the key steps necessary to augment military GPS with space-based signals of opportunity (SoOp), from curating and validating SoOp technologies to tackling the foundational data challenges inherent in using non-GPS signals. The panel will explore algorithm development, technique verification, and registration, with a strong emphasis on government-partnered testing to quantify signal performance and identify optimal combinations with other sensors. The diverse panel, including policy, military, and commercial experts, will discuss the practical implementation into user equipment and the path to operationalizing a reliable, GPS-augmenting SoOp system.
Moderator: *Dr. John Janeski, The Aerospace Corporation*

PANEL: The Future of Space-Based PNT
We will consider what the future holds for U.S. space-based Positioning, Navigation, and Timing as the current system matures. Panelists will explore concepts for next-generation systems, addressing challenges such as contested and denied environments, evolving user requirements, and opportunities for innovation. Discussions will span government, military, and commercial perspectives, focusing on emerging technologies, potential architectures, and the balance between government-led and private-sector solutions.
Moderator: *Michael Orr, USSF*

PANEL: Warfighters (SECRET Day)
An interactive discussion between the audience and a panel of warfighters with recent operational experience, informing the community on how to formulate military PNT systems better.
Moderators: *Amanda Humphrey, NSWC Crane/SOCOM PM CP, and Sean Memmen, Booz Allen Hamilton*