CALL FOR ABSTRACTS: ABSTRACTS DUE OCTOBER 7, 2020

Abstract Submission
Abstracts should be submitted electronically via the ION Abstract Management Portal, no later than October 7, 2020. To submit an abstract, sign in at ion.org/abstracts. If you have not used the Abstract Management Portal before, click “Create My Account.” Once signed in, click on the appropriate meeting name and complete the form.

- Abstracts should describe objectives, anticipated or actual results, conclusions, any key innovative steps and the significance of your work.
- Authors will be provided with an electronic author’s kit with presentation and publication guidelines in early November.
- All authors attending the meeting are required to pay registration fees.

Final Manuscripts
ITM Peer Reviewed Sessions: Completed manuscripts must be uploaded to the Abstract Management Portal (AMP) by December 1, 2020. Manuscripts will be peer reviewed by session co-chairs and designated as a primary paper, or as an alternate paper, in the onsite program based on peer review of the full manuscript. Manuscripts not received by December 1, 2020 are subject to withdrawal from the conference. Manuscripts meeting established peer review standards will be designated as “peer reviewed” in the conference proceedings. Manuscripts will only be peer reviewed one time. Authors will be given the opportunity to make corrections/revise their manuscripts for inclusion in the proceedings through February 7, 2021. However, revised manuscripts will not be re-reviewed for peer-review designation.

To be included in the conference proceedings:
1. Manuscripts must be uploaded into AMP by December 1, 2020.
2. The submitted manuscript must be representative of the original abstract submitted.
3. An author listed on the manuscript must present at the conference and pay the conference registration fee.
4. The presenting author must attend the mandatory speaker’s breakfast the morning of their session.

PTTI Sessions: PTTI papers will not be peer reviewed. Papers not representative of the original abstract submitted will not be included in the conference proceedings regardless of whether or not they were presented at the conference, and this may affect the acceptance of future abstracts by the author. Manuscripts will be accepted through February 7, 2021.

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Journal Publication
Authors of appropriate papers are encouraged to submit papers for possible publication in the ION’s archival journal, NAVIGATION (indexed by Thomson Reuters). Papers may be submitted at http://mc.manuscriptcentral.com/transportation.

Exhibit Hall
Exhibit space is available. Booths are sold in 10’ x 10’ increments and include one complimentary conference registration per booth purchased. For an exhibitor prospectus, or for more information, go to ion.org/itm/exhibits.cfm or contact Ken Esthus at the ION National Office via phone at 703-366-2723 or email at keithhus@ion.org.

Registration Information
All full-conference registrations include technical sessions, conference meal functions and events, and access to electronic proceedings. Registration for tutorials will be an additional fee. Individual registration benefits are non-transferable. Registration fees for registrants staying at the Hyatt Regency Mission Bay, that are received and paid by January 4, 2021, start at:
- Member Rate: $930
- Non-member Rate: $1,010
- Student Rate: $600
- Retired Rate: $460 (email registration@ion.org for form)
- Single Day Rate (sessions only, no proceedings): $500
- Exhibit Hall Only: $500

Student Conference Registration Grants
Student conference registration grants will be awarded on a “need basis.” The registration grant will include a full technical meeting registration to include all conference sessions, meal functions and a copy of the conference proceedings. Full-time graduate or undergraduate students who are the lead and presenting author of worthy technical paper(s) are encouraged to apply. Grants are limited and are awarded on a first come, first served basis to those meeting the criteria. Prior grant recipients are not eligible. An application must be submitted with an abstract no later than October 7, 2020. See ion.org for details.

Accommodations
Accommodations are offered at the Hyatt Regency Mission Bay. A block of rooms has been set aside for conference attendees at the discounted rate of $175 per night for single/double occupancy. These rooms will be available until April 1, 2021, or until the block fills, whichever comes first.

A limited number of government rate rooms for qualified federal agencies are also available. Reservations made after the deadline will be on a space-available basis and may not be at the special ION rate. We encourage you to make your hotel reservations early. Save $200 on your registration fees by staying at the official conference hotel. All attendees who stay at the Hyatt Regency Mission Bay and submit their hotel confirmation number at the time of conference registration will receive a $200 discount when registering for the conference. Hotel discounts cannot be applied retroactively.

Make Your Hotel Reservation Today:
- Online: ion.org/itm
- By Phone: Call 1-619-224-1234. Be sure to identify yourself as an ION ITM/PTTI attendee to receive the discounted attendee rate.
INTERNATIONAL TECHNICAL MEETING (ITM) SESSION TOPICS

GNSS Integrity and Augmentation
- Fault monitoring, fault exclusion, protection level algorithms and requirements for receiver-based integrity, ground-based, space-based and aircraft-based navigation and augmentation.
- Challenges in the provision of integrity in multi-frequency/multi-constellation services. Applications include navigation for aviation, automotive, rail, maritime and other transportation applications.

Session Co-Chairs:
- Dr. Jinsil Lee, KAIST, South Korea and Dr. Michael Feldus, Zurich University of Applied Sciences, Switzerland

GNSS and Security: Interference, Jamming, and Spoofing
- Techniques to make GNSS more robust to spoofing, jamming, and interference in general, through signal processing, complementary PNT, or other advanced methods.
- Application of GNSS signals for secure time and frequency transfer.
- Threat modeling, assessment and mitigation. Integrity and continuity implications of security measures. Analysis of GNSS disruption events.

Session Co-Chairs:
- Dr. Fabrizio Giorgetta, NIST and Dr. Jeff Sherman, NIST

Navigation in GNSS Challenged Environments
- Navigation in urban and challenging environments. Sensing, perception, and map building in ground vehicle operations. Guidance, navigation, and control (GNC) systems for autonomous or semi-autonomous vehicles.
- Sensing for urban interfaces of driver assistance systems. Requirements for ground vehicle GNC systems. Validation and verification of ground vehicle GNC systems.

Session Co-Chairs:
- Dr. Saeid Bakhshai, NRC, Canada and Dr. Fabian Rothmaier, Stanford University

Navigation of Unmanned Aerial Vehicles and Other Autonomous Systems
- Development of multi-sensor system navigation performance requirements.

New approaches for dealing with delayed and out-of-sequence measurements and how to change the fusion.

Session Co-Chairs:
- Dr. Iwano Seo, Yonsei University, South Korea and Dr. Renuka Budguit, University of Illinois at Urbana-Champaign

Precise GNSS Positioning
- New algorithms and methods for improving Precise Point Positioning (PPP), Real-Time Kinematic (RTK) and other precise positioning techniques.
- Techniques including PPP (Precise Point Positioning) and PPP-ROM (PPP Real-Time with Robust Observation Multi-criteria) in the context of no-signal solutions using fixed single-frequency, high-cost and low-cost receivers.

Session Co-Chairs:
- Dr. Iwano Seo, Yonsei University, South Korea and Dr. Renuka Budguit, University of Illinois at Urbana-Champaign

Fusion of measurements from multiple sensors, data, and information sources.
- Estimation theory, algorithms, data processing techniques, test methods, and results of new implementations.
- Integration of GNSS with other sensors such as ground-based and airborne platforms, maps, maps of opportunity, infrared, ultrasound sensors, etc.
- Integration of interest include context-awareness based integration, collaborative approaches such as methods enabled by communication and internet infrastructure.

Session Co-Chairs:
- Dr. Melanie Sui, European Commission JRC, Italy and Dr. Li-Ya Hua, Hong Kong Polytechnic University, China

Prospects and Challenges in GNSS for Space: Satellite Constellations and Space-based Systems
- Prospects and challenges of using GNSS for space-based systems.
- Development of new space-based systems for GNSS.

Session Co-Chairs:
- Dr. Didier Gomperts, ESA and Dr. Jeff Sherman, NIST

Precise Time and Time Interval (PTTI) Session Topics

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INSTITUTION OF NAVIGATION

Co-located ITM and PTTI 2021: ONE Registration Fee, TWO Technical Events and a Commercial Exhibit

ION.org

INTERNATIONAL TECHNICAL MEETING (ITM) SESSION TOPICS

INTRODUCTION TO GNSS AND SPACE-BASED NAVIGATION

GNSS Beyond Medium Earth Orbit GNSS
- Going beyond signals from Medium Earth Orbit (MEO) GNSS, this session addresses aspect of Global Navigation System (GNSS) as well as signals for communication and positioning services.
- Navigation beyond Medium Earth Orbit (MEO) GNSS such as Global Navigation Satellite System (GNSS) and the European Union’s Galileo.

Session Co-Chairs:
- Dr. Zak Kassas, University of California Irvine and Dr. Tyler Reid, Krasco Space Systems

Receiver Design, Signal Processing, and Antennas
- GNSS receiver signal processing techniques, especially in operations in environments including underground, in-cabin, foliage, scintillation or high-dynamics.
- Improved acquisition and tracking sensitivity, and resilience to interference and multipath effects.

Session Co-Chairs:
- Dr. Ching-Chao Wang, Hampton University and Dr. Larry Sparks, Jet Propulsion Laboratory

Safety-critical Applications of GNSS and Other Sensors
- Safety-critical applications of GNSS and other sensors.
- Topics include: integrity monitoring for filtered sensors, validation of sensor data and analysis techniques including filtering and clustering, and development of statistical models for measurement and process noise for use in safety-critical applications.

Session Co-Chairs:
- Dr. Mihaela-Simona Circu, German Aerospace Center DLR, Germany and Dr. Steven Langel, The MITRE Corporation

Fusion of measurements from multiple sensors, data, and information sources.
- Estimation theory, algorithms, data processing techniques, test methods, and results of new implementations.
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Network Synchronization Technologies for High-end and Robust Critical Infrastructure
- Development of new synchronization transfer methods such as PTP, PTP and White Rabbit offer a range of synchronization performances for both industry and high-end science.
- When combined with atomic clocks, the high-end science are used for high-precision applications, while the industry use for industrial applications.

Session Co-Chairs:
- Dr. Elizabeth Laier English, National Physical Laboratory, UK and Dr. John Clarke, Masterlock

Space-BASED Time And Frequency Transfer – Established and Emerging
- Established one-way and two-way GNSS-based time transfer methods such as NTP, PTP and White Rabbit offer a range of synchronization performances for both industry and high-end science.
- When combined with atomic clocks, the high-end science are used for high-precision applications, while the industry use for industrial applications.

Session Co-Chairs:
- Dr. Travis Dinkell, The Aerospace Corporation and Gregory Weaver, Johns Hopkins University/APL

Terrestrial Time and Frequency Transfer
- Time and frequency transfer requires a terrestrial exchange of physical signals. We focus on timing and synchronization technologies that are used to transfer time and frequency over terrestrial networks.

Session Co-Chairs:
- Dr. Tetsuya Ueda, NICT, Japan and Dr. Gary van der Stelt, NICT

The Redefinition of the SI Second
- The redefinition of the SI second, which is based on optical atomic clocks, is being proposed by the International Committee for Weights and Measures (CIPM).
- The new definition of the second is based on the transition between two hyperfine levels of the caesium-133 atom in a specific state of motion.

Session Co-Chairs:
- Dr. Demetrios Katsaros, National Research Council, Canada and Dr. Tamara Matsuoka, Masterlock

GPS EXPERIENCE IN SPACE - INTERNATIONAL EXPERIENCE
- GPS experience in space, including applications and challenges.
- International experience in space, including partnerships and collaborations.

Session Co-Chairs:
- Dr. Zak Kassas, University of California Irvine and Dr. Tyler Reid, Krasco Space Systems

The Netherlands and Dr. Erin Kahr, Hexagon, Canada

Co-Chairs:
- Dr. Jinsil Lee, KAIST, South Korea and Dr. Michael Feldus, Zurich University of Applied Sciences, Switzerland

Session Co-Chairs:
- Dr. Zak Kassas, University of California Irvine and Dr. Tyler Reid, Krasco Space Systems

PNR: PRE-CONFERENCE TUTORIALS
- Fundamentals of time and its measurement.
- Transfer time protocols.
- Microwave oscillators.
- Optical oscillators.
- Optical transmission.

Session Co-Chairs:
- Dr. Elisa Felicita Arias, SYRTE/Paris Observatory, France

Countering Jamming and Spoofing on GNSS Timing Services
- Timing systems depending on GNSS signals are at the core of numerous critical applications, including the electric power grid, telecommunications systems, financial and stock exchanges, and digital TV broadcasting. However, the vulnerabilities of these systems are of concern.
- Techniques to make GNSS more robust to spoofing, jamming, and interference in critical infrastructure systems.

Session Co-Chairs:
- Dr. Zak Kassas, University of California Irvine and Dr. Tyler Reid, Krasco Space Systems

Navigation of Unmanned Aerial Vehicles and Other Autonomous Systems
- Advanced positioning and navigation algorithms for novel sensors, sensor fusion, and signals of opportunity.

Session Co-Chairs:
- Dr. Saeid Bakhshai, NRC, Canada and Dr. Fabian Rothmaier, Stanford University

Advances in GNSS positioning and navigation, particularly in the context of non-GNSS technologies and solutions requiring a terrestrial exchange of physical signals. We focus on timing and synchronization technologies that are used to transfer time and frequency over terrestrial networks.

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