Abstract Submission

Abstracts should be submitted electronically via the ION Abstract Management Portal, no later than November 1, 2018. To submit an abstract, sign in at www.ion.org/abstracts. If you have not used the Abstract Management Portal before, click "Create My Account". Once signed in, click on ION Pacific PNT 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 December.

All authors attending the meeting are required to pay registration fees.

Final Manuscripts

Completed manuscripts must be uploaded to the ION's Abstract Management Portal (AMP) by February 8, 2019. Manuscripts will be designated as a primary paper, or as an alternate paper, in the onsite program based on the Session Chairs' peer review of the full manuscripts.

Manuscripts will be peer reviewed once (note that there will be no secondary review). Manuscripts 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. While full manuscripts are required for peer review by February 8, corrected/updated manuscripts will be accepted through April 19, 2019.

To be included in the conference proceedings final manuscripts must meet the peer review requirements, an author must present at the conference as scheduled in the conference program and pay the conference registration fee.

Exceptional manuscripts will be considered for Best Paper Awards.

Complimentary online access to papers will be provided to all eligible conference registrants through June 30, 2019. Eligible conference registrants will be able to download an electronic version of the proceedings following the conference.

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 online at http://mc.manuscriptcentral.com/navigation.

Table Top Exhibits

Table top exhibits are $2,200 each, which includes one six-foot table pushed flush against the wall, one chair and one full conference registration. For more information please contact the ION National Office (phone: 703-366-2660; e-mail: kesthus@ ion.org).

Registration Information

Full registration includes all sessions, conference meal functions, and an electronic version of the proceedings. Individual registration benefits are nontransferable. (Registration rates quoted below are contingent upon your staying in the conference hotel - higher registration rates will apply for those not staying in the conference hotel).

- Member/Corporate Member Rate : $990*
- Non-member Rate: $1,070*
- Student Rate: $600*
- Single Day Rate: $600*

* Received and paid by March 15 and staying at Hilton Waikiki

Advance Hotel Reservation Information

Accommodations are offered at the Hilton Waikiki Beach, which is across the street from the most vibrant stretch of beach in Hawaii.

Room Rate: $209 per night for conference attendees who book before March 15. Limited government rates are available to U.S. government employees.

Resort Fee: The Hilton Waikiki Beach has no resort fee.

Self-Parking: $35 valet per night for overnight guests.

Reservations:
- Online: Visit www.ion.org/pnt
- By Phone: 1-808-922-0811; be sure to identify yourself as an ION Pacific PNT attendee to receive the special attendee rate!

About Waikiki

Located on the south shore of Honolulu, on the Island of Oahu, the world-famous neighborhood of Waikiki was once a playground for Hawaiian royalty. Known in Hawaiian as "spouting waters," Waikiki was first introduced to the world in 1901. Today, Waikiki is Oahu's main hotel and resort area and a vibrant gathering place for visitors from around the world.

Waikiki is most famous for its beaches, but non-beach entertainment abounds as well. Attractions in Waikiki include the Honolulu Zoo and the Waikiki Aquarium. Visitors can learn about the history of Waikiki by reading the surfboard markers along the Waikiki Historical Trail. Along the main strip of Kalakaua Avenue, attendees will find world-class shopping, dining, entertainment, activities and resorts. Waikiki is within 30 minutes of a variety of Oahu attractions, including Pearl Harbor, Iolani Palace, the Nuuanu Pali Lookout, Hanauma Bay, the Ala Moana Shopping Center, the local neighborhood of Kapahulu and the arts district of Chinatown.

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Aloha from

PACIFIC PNT

Where East Meets West in the Global Cooperative Development of Positioning, Navigation and Timing Technology
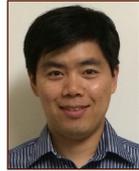
CALL FOR ABSTRACTS
Abstracts Due November 1

April 8-11, 2019
Hilton Waikiki Beach • Honolulu, Hawaii
www.ion.org/pnt

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Session Topics

Aircraft Navigation and Surveillance

Advances in aircraft navigation and surveillance. Future navigation requirements, integrity monitoring (RAIM/FDE), integration with inertial, automatic dependent surveillance, collision avoidance and radar.

Co-chairs: Neeraj Pujara, *Air Force Research Laboratory, USA* and Dr. Maarten Uijt de Haag, *Ohio University, USA*

Algorithms and Methods

Methods and advanced algorithms for positioning, navigation, and timing with a diversity of sensors and signals. Approaches to exploit multiple GNSS constellations and new signal structures. Nonlinear estimation, optimization, and fusion algorithms. Techniques to improve acquisition and tracking in terms of sensitivity, robustness, accuracy, and multipath mitigation.

Co-chairs: Dr. Xin Chen, *Shanghai Jiaotong University, China;* Wenyi Li, *Tsinghua University, China;* Dr. Madeleine Naudeau, *AFRL, USA;* and Dr. Kewen Sun, *Hefei University of Technology, China*

Special Session Topics

BeiDou

The Chinese satellite navigation system BeiDou is becoming a major player in GNSS. This special session will feature invited and contributed presentations on all aspects of current and new BeiDou systems and applications developments: new BDS signal designs and receiver development, BDS signal-in-space quality monitoring and assessment, interoperable space service volume for autonomous orbital determination, BDS/GNSS Interference detection, inter-satellite link technology, messaging systems, and new BDS/GNSS applications.

Co-chairs: Dr. Ruizhi Chen, *Wuhan University, China* and Dr. Xinqun Zhan, *Shanghai Jiaotong University, China*

Alternative Navigation and Signals of Opportunity

Navigation using signals from digital TV and radio, radar, cellular networks, Wi-Fi, telecommunications networks, ultra-wideband signals, pattern matching, sensor integration and indoor messaging systems. Advances in systems, algorithms, and integration techniques for terrestrial PNT, including eLoran, DME, pseudolites, terrestrial transmitters, Wi-Fi, cellular, VLF/LF systems, one-way and two-way RF ranging. Navigation using signals and standards unique to Pacific Rim countries is especially welcome.

Co-chairs: Dr. Kyle Kauffman, *AFIT, USA* and Dr. Yuen Chau, *Nanyang Technological University, Singapore*

Aviation Applications of GNSS

Applications of GNSS to aviation navigation, precision approach and landing. Ground-based and space-based augmentation systems (LAAS, WAAS, EGNOS, GAGAN, MSAS), flight test performance, integrity designs, integration with other aircraft sensors such as inertial and barometric altimeter. Challenges, issues, policy and progress toward certification of GNSS receivers for aviation applications. Topics relevant to Pacific Rim countries are especially welcome.

Co-chairs: Dr. Todd Walter, *Stanford University, USA* and Dr. Eugene Bang, *ENAC, France*

Challenging Navigation Problems

Navigation in indoor, urban, surface, underwater, and other GNSS-degraded environments. Inertial navigation, acoustic devices for bathymetry, positioning and velocity determination for underwater vehicles and ships, sonar developments and transponder networks. Non-traditional and collaborative navigation techniques, including terrain-aided navigation, low cost sensors, non-linear signal processing techniques, reconfigurable filter designs, plug-and play concepts, connectivity, information sharing and safety aspects. Topics addressing special challenges in Pacific Rim regions are especially welcome.

Co-chairs: Dr. Dorota Grejner-Brzezinska, *The Ohio State University, USA* and Dr. Charles Shao, *Tsinghua University, China*

Emerging PNT Consumer Applications

PNT for advancement in intelligent transportation, social media, domestic and healthcare products, precision agriculture and machine control. Driverless cars, driver-assist technologies, vehicle-to-vehicle communications, automotive radar, lane-keeping, parking assist; positive train control; augmented reality and gaming systems integration with PNT; autonomous wheel chairs, lawnmowers, snowplows, vacuums; Alzheimer's and autistic patient tracking systems; monitoring, navigation, and control of machinery used in agriculture, construction, and mining.

Co-chair: Shunsuke Kamijo, *The University of Tokyo, Japan*; Masaaki Hayashi, *Seiko Epson Corporation, Japan*; and Neil Vancans, *Septentrio, Belgium*

COSMIC/FORMOSAT

COSMIC/FORMOSAT is a constellation of six micro-satellites launched one decade ago through a partnership between Taiwan and the USA. These extremely cost-effective LEO satellites rely on occultation measurements of GPS signals to infer atmospheric profiles to improve weather forecasting, climate modeling, and ionosphere and space weather monitoring. The resounding success of the project led to a follow-on mission, COSMIC-2/FORMOSAT-7, expected to be launched in 2018. This special session will feature invited presentations and contributed work on all aspects of this exemplifying project and future outlook of the next generation capabilities.

Co-chairs: Dr. Loren Chang, *National Central University, Taiwan* and Dr. Bill Schreiner, *UCAR, USA*

GNSS-R and GNSS-RO for Environmental Monitoring

The use of GNSS and GNSS reflections for remote sensing of ocean roughness, wave height, and wind speed; soil moisture and vegetation water content measurements; the use of GNSS radio occultation for tropospheric and ionospheric profiling; and airborne, balloon, mountain top, and other satellite-based reflectometry and radio occultation advances.

Co-chairs: Dr. James Garrison, *Purdue University, USA* and Dr. Amal Chandran, *Nanyang Technological University, Singapore*

High Precision GNSS Correction and Monitoring Networks

Local area, wide area and worldwide GNSS correction networks, design, status, precise clock and orbit products, ionosphere/troposphere corrections, signal anomalies, performance results, multi-constellation networks, new developments and applications, and unique characteristics of corrections in Asia-Pacific areas.

Co-chairs: Patricia Doherty, *Boston College, USA* and Dr. Zhizhao Liu, *Hong Kong Polytechnic University, Hong Kong*

Inertial Navigation Technology and Applications

Applications and integration of INS with other navigation sensors. Design, modeling, calibration, advanced processing techniques, performance characteristics of different technologies, including but not limited to MEMS, FOG, laser gyro and cold-atom. Open architecture design, integration, fault detection and isolation, and testing. New developments in low cost inertial sensing for personal and automotive applications. Design, manufacturing, and testing of low cost sensors in emerging application areas. Algorithms for calibration and integration with other low-cost sensors. Navigation algorithm and sensor development for UAS navigation, stabilization, guidance and control. Integration with autopilots, flight management systems and UAS sensors. Considerations for safety of flight, testing, and standardization especially in Asia Pacific countries.

Co-chairs: Dr. Benjamin Mohr, *Honeywell, USA* and Dr. Yuanxin Wu, *Shanghai Jiaotong University, China*

Interference and Spectrum

Effects of interference on GNSS performance, compatibility of GNSS with terrestrial and satellite-based services. Radiofrequency compatibility between satellite navigation systems. Interference detection, characterization and mitigation techniques. Robust navigation in the presence of interference.

Co-chairs: Logan Scott, *Logan Scott Consulting*, USA and Dr. Jiwon Seo, *Yonsei University, South Korea*

QZSS

Japan's Quasi-Zenith Satellite System (QZSS) is expected to be operational in 2018. The session will have presentations from the government, contractors, universities, and industries to showcase the QZSS regional satellite navigation program, including the latest QZSS program status, launch schedule of satellites, navigation performance, payload design/characteristics, receiver development, technical validation results, and application development activities.

Co-chairs: Dr. Takeyasu Sakai, *National Institute of Maritime, Port and Aviation Technology, Japan* and Prof. Nobuaki Kubo, *Tokyo University of Marine Science and Technology, Japan*

Ionosphere Monitoring with GNSS

Processing algorithms for ionosphere monitoring, characterization from single and multiple GNSS receivers, ionospheric propagation phenomena, receiver design and tracking algorithms, tomography, ionospheric attenuation and scintillation, higher-order effects, plasma drift estimation and gradient measurements and Asia-Pacific regional ionosphere characteristics.

Co-chairs: Dr. Tzu-Wei Fang, *NOAA, USA* and Dr. Zhe Yang, *Tongji University, China*

Natural Hazards Detection and Monitoring Using GNSS

The use of GNSS receiver networks to monitor and predict geophysical events, especially using networks in the Asia-Pacific region are encouraged. Submissions in seismic waves, volcano eruptions and ashes, sand storms, explosions, tsunami monitoring, monitoring networks, ground deformation, processing and analysis techniques, and prediction algorithms are also solicited.

Co-chairs: Yoshikatsu Iotake, *Global Positioning Augmentation Service Corporation, Japan* and Dr. Attila Komjathy, *JPL, USA*

Time and Frequency Distribution

Precise time synchronization and frequency transfer between fixed and mobile platforms, new developments in oscillator technology, optical clocks, chip-scale atomic clocks, terrestrial and satellite two-way time transfer, GNSS time transfer, GNSS time offsets, error sources and performance characteristics, and oscillators for space and scientific applications.

Co-chairs: Dr. Frank van Graas, *Ohio University, USA* and Dr. Jianfeng Wu, *National Time Service Center, China*

UAS Technologies

Equipment and procedures for Unmanned Aerial Systems, novel platforms and applications, sense and avoid, communication, navigation, human factors, standards, test and evaluation.

Co-chairs: Dr. Nisar Ahmed, *University of Colorado, USA*; Dr. Shaohui Foong, *Singapore University of Technology & Design, Singapore*; Dr. Steven Phee, *Singapore DSO, Singapore*; and Dr. Robert Leishman, *AFIT, USA*

PLENARY: Policy and Status Update

Updates and status of satellite-based navigation systems that are in operation or under development. System overview, current and planned performance, schedule and plans, current policies, and services and special challenges affecting Asian-Pacific areas.

Co-chairs: Dr. John Raquet, *AFIT, USA* and Dr. Mikel Miller, *Integrated Solutions for Systems, USA*