

**United Nations International Meeting on the Applications of
Global Navigation Satellite Systems**

Hosted by
the United Nations Office for Outer Space Affairs

Co-organized and co-sponsored by
The International Committee on Global Navigation Satellite Systems

5 – 9 December 2022

Vienna, Austria

PROGRAMME

Venue: Vienna International Centre (VIC), C-Building, Conference Room, CR-1 (second floor)	
Time: Vienna time (UTC+1.00 hours)	
Monday, 5 December 2022	
10:00	Opening and Welcome Remarks
	<i>Sharafat GADIMOVA, United Nations Office for Outer Space Affairs (UNOOSA)</i>
	Session 1: GNSS and Satellite-based Augmentation Systems Update <i>Chairperson: Sharafat GADIMOVA, Office for Outer Space Affairs</i> <i>Rapporteur: Lin YOLA, Indonesia</i>
10:10	GPS Programme Update, <i>Chris ERICKSON, United States of America</i>
10:30	BeiDou Navigation Satellite System Status and Development, <i>Gucang CHEN, China (online)</i>
10:50	GALILEO Programme Update, <i>Dominic HAYES, European Union</i>
11:10	International Committee on GNSS (ICG): Recent Developments, <i>Sharafat GADIMOVA, UNOOSA</i>
11:30 – 11:50	<i>Coffee Break</i>
11:50	Continental Cost Benefit Analysis for Utilization of GNSS Applications and Implementation of SBAS Services in Africa, <i>Lasisi Salami LAWAL, Nigeria</i>
12:10	Augmentation Systems to Improve Navigation Procedures in Low Latitude Region, <i>Jorge GARCIA VILLALOBOS, Peru</i>
12:30	Analysis of multi-GNSS data of continuous sites in Indian subcontinent, <i>Chiranjeevi Vivek GANAPA, India (online)</i>
12:50	Questions and discussions
13:00 – 14:30	<i>Lunch Break</i>
	Session 2: GNSS Applications and Reference Frames Networks <i>Chairperson: Andrzej KRANKOWSKI, Poland</i> <i>Rapporteur: Oluwakemi DARE-IDOWU, Nigeria</i>
14:30	Development of Integrated Technology of GNSS Receiver and Environmental Sensor: Navigation Study of Urban Traffic and Air Pollution in Jakarta, <i>Garrin Alif NANDITHO, Indonesia</i>
14:50	GNSS application for Jakarta's Flash Flood Early Warning System, <i>Lin YOLA, Indonesia</i>
15:10	DEM Study on Hydrological Response in Makkah City, Saudi Arabia, <i>Mohamed ELHAG, Saudi Arabia</i>
15:30 – 15:50	<i>Coffee Break</i>
15:50	Precise Time and Frequency Measurements and Comparisons using GNSS, <i>Thayathip THONGTAN, Thailand</i>
16:10	Keeping PACE with Global Standards – Modernizing the Philippine Geodetic Reference Frame, <i>Almalyn BALLADARES, Philippines</i>

16:30	Overview of GNSS Spoofing and Some Test Results of Signal Authentication, <i>Dinesh MANANDHAR, Japan</i>
16:50	Questions and discussions
17:00	Adjourn
Tuesday, 6 December 2022	
	Seminar on GNSS Spectrum Protection and Interference Detection and Mitigation <i>Moderators: ICG Working Group S</i>
	<i>The purpose of the seminar is to highlight the importance of GNSS spectrum protection at the national level and to explain how to reap the benefits of GNSS. Discussions between the ICG experts presenting the material and the meeting participants will also be held.</i>
09:30 – 17:00	<ul style="list-style-type: none"> ▪ Introduction and Overview ▪ Introduction to GNSS ▪ Spectrum Management ▪ Spectrum Protection ▪ Summary and Interactive Discussion
11:00 – 11:20	<i>Coffee Break</i>
12:30 – 14:00	<i>Lunch Break</i>
14:00	10th Interference Detection and Mitigation Workshop
15:30 – 15:50	<i>Coffee Break</i>
17:00	Adjourn
Wednesday, 7 December 2022	
10:00	Seminar on GNSS Spectrum Protection and 10th Interference Detection and Mitigation (continues) <i>Moderators: ICG Working Group S</i>
10:00 – 11:30	<ul style="list-style-type: none"> ▪ Interference Detection and Mitigation
11:30 – 11:50	<i>Coffee Break</i>
11:50 – 13:00	<ul style="list-style-type: none"> ▪ Summary and Interactive discussions
13:00 – 14:30	<i>Lunch Break</i>
	Session 3: GNSS Applications and GNSS Performance <i>Chairperson: Erikson LOPEZ, Ecuador</i> <i>Rapporteur: Prajakta CHOUGULE, India</i>
14:30	Augmentation Systems and Safety of Life Applications, <i>Todd WALTER, United States of America</i>

15: 00 – 15:20	<i>Coffee Break</i>
15:20	Constellation Performance and Monitoring, <i>Todd WALTER, United States of America</i>
15:50	Algerian Satellite based Augmentation System based on ALCOMSAT-1: Characteristics and Preliminary Performance Tests, <i>Salem KAHLOUCHE, Algeria</i>
16:10	International Activity on GNSS Application Enhancement, <i>Giovanni LUCCHI, EUSPA</i>
16:40	GNSS and UAV's: The emergence of technology and systems: <i>The blurring of boundaries in Space?</i> <i>Sarah Jane FOX, United Kingdom</i>
17:00	Adjourn
Thursday, 8 December 2022	
	Session 4 – GNSS Low-Cost Receivers applications <i>Chairperson: Almalyn BALLADARES, Philippines</i> <i>Rapporteur: Krishna Prasad BHANDARI, Nepal</i>
10:00	Performance of Low-Cost GNSS Receivers for Ionospheric Studies, <i>Anton KASHCHEYEV, Canada</i>
10:20	On the Performance and Prospects of Low-cost GNSS Receiver in Monitoring Space Weather at African Low Latitudes, <i>Oluwakemi DARE-IDOWU, Nigeria</i>
10:40	Low-Cost GNSS Receiver System for High Accuracy, Space Weather and Technology Promotion, <i>Dinesh MANANDHAR, Japan</i>
11:00	Space Weather Study through Analysis of Solar Radio Bursts Detected by a Single-Station CALLISTO Spectrometer, <i>Jean UWAMAHORO, Rwanda</i>
11:20	Low- Cost Location Accuracy Improvement Solution for Developing Countries, <i>Maria ZUBAIR, Pakistan</i>
11:40 – 12:00	<i>Coffee Break</i>
12:00 – 13:00	Session 5 – GNSS observations for Ionospheric monitoring and modelling <i>Chairperson: Christine AMORY, France</i> <i>Rapporteur: Anton KASHCHEYEV, Canada</i>
12:00	Mitigation of GNSS Ionospheric Effects Using Statistical Learning-based Self-Adaptiveness to Positioning Environment Conditions, Embedded in GNSS SDR User Equipment, <i>Renato FILJAR, Croatia</i>
12:20	Development of the new IGS Ionospheric Product - ROTI Maps and its Synergies with the International LOFAR Telescopes, <i>Andrzej KRANKOWSKI, Poland</i>
12:40	TEC Variability and Comparison of Models During Solar Cycle 23 and 24 over Equatorial Low Latitude IGS Station, Bangalore (13.02° N, 77.57° E), <i>Prajakta CHOUGULE, India</i>
13:00 – 14:30	<i>Lunch Break</i>
	Session 6 – GNSS applications: Case Studies <i>Chairperson: Dinesh MANANDHAR, Japan</i>

	<i>Rapporteur: Thayathip THONGTAN, Thailand</i>
14:30	Initial Results of Total Electron Content over Low Latitude Station, Sangli (16°52' N, 74° 34' E), <i>Dadaso SHETTI, India</i>
14:50	Ionospheric Total Electron Content Above Ecuador, <i>Ericson LOPEZ, Ecuador</i>
15:10	Advances in Space Weather using GNSS in Asia over the past decade, <i>Christine Marie Eugénie AMORY, France</i>
15:30 – 15:50	<i>Coffee Break</i>
15:50 – 17:00	Discussion Session: Capacity Building and Information Dissemination <i>Moderator: Sharafat GADIMOVA, Office for Outer Space Affairs</i>
	<ul style="list-style-type: none"> ▪ <i>International/Regional collaboration opportunities that could be established in order to promote the use of enabling space technologies, and the workshop follow-up projects/initiatives</i> ▪ <i>Requirements of implementing, mechanisms and resources for developing of partnerships and networks</i> ▪ <i>Type and level of training required for addressing enabling space technologies and their applications</i> ▪ <i>Next steps (proposals for future workshops/training courses).</i>
17:00	Adjourn
Friday, 9 December 2022	
	Session 7 – Capacity Building and National Programmes <i>Chairperson: Maria ZUBAIR, Pakistan</i> <i>Rapporteur: Sarah Jane FOX, United Kingdom</i>
10:00	Space Weather, a Key Vulnerability to GNSS, <i>Zahra BOUYA, Australia (online)</i>
10:20	BeiDou/GNSS-based Agricultural Machinery Navigation and Big Data Application, <i>Caicong WU, China (online)</i>
10:40	BDS Application in the Transport Industry, <i>Falong LIU, China (online)</i>
11:00	BDS/GNSS Instantaneous Decimeter-level PPP Method and Applications: GNSS Research Center, <i>Qile ZHAO, China (online)</i>
11:20 – 11:40	<i>Coffee Break</i>
11:40	GPS, GNSS based Online Data Processing System – MONPOS, <i>Zolzaya LKHAMSUREN, Mongolia</i>
12:00	Establishment of GNSS Lab at Pashchimanchal Campus Tribnuvan university, Pokhara, Nepal, <i>Krishna Prasad BHANDARI, Nepal</i>
12:20	Capacity Development Activities on GNSS, <i>Otgonjargal TERBISH, Mongolia</i>
12:40 -13:00	Summary of the Meeting and Concluding Remarks
13:00	Adjourn