

International Committee on Global Navigation Satellite Systems (ICG) and its activities

**International workshop for the Implementation of the Global
Geodetic Reference Frame (GGRF) in Latin America
16 – 20 September 2019, Buenos Aires, Argentina**

Sharafat Gadimova
United Nations Office for Outer Space Affairs



International Committee on GNSS (ICG)

- UNOOSA serves as the executive secretariat of ICG
- The ICG promotes **voluntary cooperation** related to civil satellite-based positioning, navigation, timing, and value added services
- Encourages **coordination** among GNSS providers
- **Promotes** the introduction and utilization of GNSS services in developing countries
- **Assists** GNSS users with their development plans and applications
- Contributes to the **sustainable development** of the world
- Assure GNSS **interoperability and compatibility** among providers and users globally for enhanced services and applications





ICG: Membership and Annual Meetings

- *Members:* Current and future core, regional or augmentation systems providers: China (BeiDou), EU (Galileo/EGNOS), Russia (GLONASS/SDCM), United States (GPS/WAAS), India (IRNSS/GAGAN), Japan (QZSS/MSAS), Nigeria (NIGCOMSAT)
- State Members of the United Nations with an active programme in implementing or promoting a wide range of GNSS services and applications: Italy, Malaysia, United Arab Emirates, **Australia** (*satellite based augmentation system*)
- *Associate Members and Observers:* 21 organizations
- *Annual Meetings:* UNOOSA (2006), India (2007), ... **China (2018), India (2019), Vienna (2020), UAE (2021)**
- **Providers' Forum: 22nd Meeting, 10 June 2019, Vienna, Austria:** *Open Service Information Dissemination, Open Service Performance, Spectrum Protection*
 - **ICG-14 meeting, Bengaluru, INDIA, 8 – 13 December 2019**



Working Group Systems, Signals and Services (S)

■ **The subgroup on compatibility and spectrum protection:**

- continued its campaign to promote adequate protection of GNSS spectrum through education and outreach;

<http://www.unoosa.org/oosa/en/ourwork/icg/working-groups/s/IDMIndex.html>

- continued to investigate methods of implementing interference detection and mitigation capabilities through permanent network-based solutions and through crowdsourcing techniques;
- progress in encouraging national regulators to use relevant ITU protection criteria for GNSS was assessed, and the compatibility of search and rescue downlink broadcasts by GNSS in the L band was added to the scope of the subgroup's work, as cooperation with the International Satellite System for Search and Rescue (Cospas-Sarsat) programme was envisaged, and taking into account the role of ITU and national administrations.

■ **The subgroup on interoperability and service standards:**

- focused on open service performance standards and international GNSS monitoring and assessment. A dedicated team of experts completed a document defining guidelines for developing open service performance standards, completing work that has been under way since 2012



Working Group Enhancement of GNSS Performance, New Services and Capabilities (B)

- All providers have agreed on the information presented in this booklet, and on several recommendations to continue development, support, and expansion of the multi-GNSS SSV concept.
- This publication, and the work of WGB, show the significant value of GNSS SSV for a much wider scope of future space exploration activities for countries all over the world.
- GNSS SSV and its potential augmentations can enable ambitious future missions and activities in the context of space exploration going beyond low-Earth orbit to the Moon, Mars and other celestial bodies.

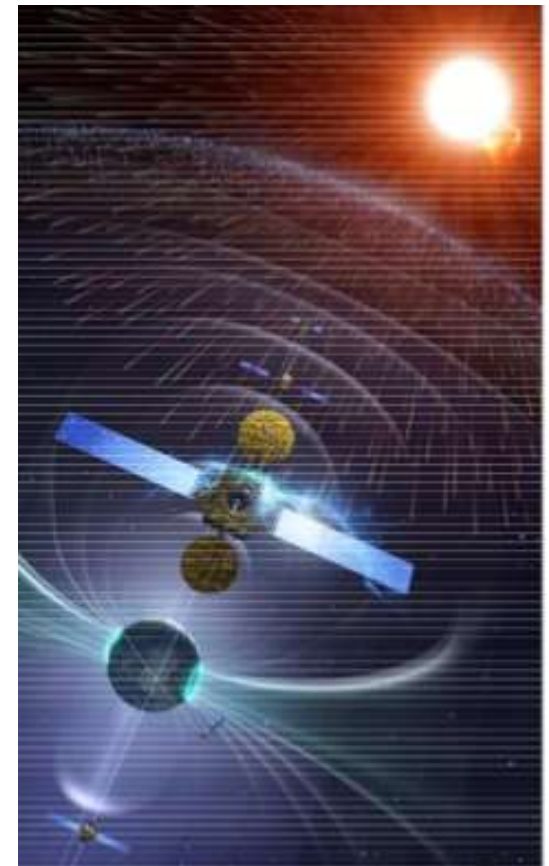


http://www.unoosa.org/res/oosadoc/data/documents/2018/stspace/stspace75_0_html/stspace_75E.pdf



Working Group Enhancement of GNSS Performance, New Services and Capabilities (B)

- The importance of exploiting the multitude of signals broadcast by GNSS enabling better monitoring of **space weather phenomena** and progressing the understanding of the ionosphere is continued to be addressed
 - Examine the performance of atmospheric models to correct single frequency measurements and recommend models for implementation to Service Providers;
 - Establish a dialogue with Space Weather/Remote Sensing community in order to identify how GNSS can better support the advancement of Space Weather/Remote Sensing products and vice versa.





Working Group Reference Frames, Timing and Applications (D)

- Specific progress in the following areas:
 - the refinement of the alignment of GNSS reference frames to the International Terrestrial Reference Frame (ITRF); and
 - information on GNSS timing references and the inter-comparison of GNSS time offsets.
 - the templates on geodetic and timing references will be updated by the GNSS providers to reflect the changes.
- A joint meeting with WG B & S to discuss *“Interoperability of GNSS precise point positioning services”*

<http://www.unoosa.org/oosa/en/ourwork/psa/schedule/2019/2019-workshop-on-global-navigation-satellite-systems-presentations.html>





ICG: Programme on GNSS applications

- ❖ **United Nations Regional Workshops/training courses on the use and applications of GNSS**
 - Building the capacity of developing countries in using GNSS technology for sustainable development
 - *2019: Workshop on the applications of GNSS, 24 – 28 June, Suva, Fiji*
 - **WGS:** Seminar on GNSS Spectrum Protection and Interference Detection and Mitigation:
 - The purpose of the seminar is to educate participants on the importance of GNSS spectrum protection at the national level and explain how to reap the benefits of GNSS
 - **WGD&B&S:** Special technical session on Interoperability of GNSS PPP services
 - Access to high accuracy positioning services provided by GNSS and regional navigation satellite systems would serve as an enabler for emerging mass-market high accuracy positioning applications, such as in autonomous systems in transportation, construction, agriculture and location-based service applications.
 - **2020: 20 – 24 April, Ulaanbaatar, Mongolia**



ICG: Programme on GNSS applications

❖ Reference frames and timing (WGD)

- To benefit operational geodesists or surveyors involved in positioning and measurement and potentially dealing with sea level changes. It is open to government, private sector, academic or graduate students in surveying or a related discipline (IAG, FIG, IGS)
- Technical Seminars on Reference Frames in Practice, FIG Working Week 2019, 20 – 21 April, Hanoi, Vietnam
 - Objective: Vertical and geometric reference frames with a focus on examples for the Asia-Pacific region
- International Workshop on the Implementation of the Global Geodetic Reference Frame (GGRF) in Latin America, 16 – 20 September 2019, Buenos Aires, Argentina
 - Objective: Dissemination of knowledge, data and information on geoscience topics



ICG: Programme on GNSS applications

❖ Space Weather and GNSS (WGC)

- Promotes the use of GNSS for scientific applications and space weather in developing countries
- Increased number of students and young scientists studying and using GNSS, including increasing participation by women, and many opportunities for research (improved imaging of the ionosphere over the equatorial region, ionospheric effects on augmentation systems...)
- *In cooperation with the Institute for Scientific Research at Boston College, the United States, and the Abdus Salam International Centre for Theoretical Physics, Italy: A series of outreach workshops on space weather effects on GNSS operations*
- 2019: Workshop on Ionospheric Forecasting for Global Navigation Satellite Systems Operations in Developing Countries: Findings and Challenges, 27 - 31 May, Trieste, Italy
- 2020: CRASTE-LF, Rabat, Morocco, 5 – 16 October
 - To provide updated knowledge to use GNSS for ionospheric and space weather research in developing countries



ICG Information Portal



International Committee on Global Navigation Satellite Systems (ICG)

MISSION STATEMENT

The International Committee on Global Navigation Satellite Systems (ICG), established in 2005 under the umbrella of the United Nations, promotes voluntary cooperation on matters of mutual interest related to civil satellite-based positioning, navigation, timing, and value-added services. The ICG contributes

to the sustainable development of the world. Among the core missions of the ICG are to encourage coordination among providers of global navigation satellite systems (GNSS), regional systems, and augmentations in order to ensure greater compatibility, interoperability, and transparency; and to promote the introduction and utilization of these services and their future enhancements, including in developing countries, through assistance, if necessary, with the integration into their infrastructures. The ICG also serves to assist GNSS users with their development plans and applications, by encouraging coordination and serving as a focal point for information exchange.



International Committee on
Global Navigation Satellite Systems

VISION STATEMENT

The International Committee on Global Navigation Satellite Systems (ICG) strives to encourage and facilitate compatibility, interoperability and transparency between all the satellite navigation systems, to promote and protect the use of their open service applications and thereby benefit the global community. Our vision is to ensure the best satellite based positioning, navigation and timing for peaceful uses for everybody, anywhere, any time.

At the "United Nations International Meeting for the Establishment of the International Committee on Global Navigation Satellite Systems (ICG)" held on 1-2 December 2005 in Vienna, Austria, the ICG was established on a voluntary basis as an informal body for the purpose of promoting cooperation, as appropriate, on matters of mutual interest related to civil satellite-based positioning, navigation, timing, and value-added services, as well as compatibility and interoperability among the GNSS systems, while increasing their use to support sustainable development, particularly in the developing countries. The participants in the meeting agreed on an establishment of the ICG information portal, to be hosted by UNOOSA, as a portal for users of GNSS services.

Our Work

Secretariat of COPUOS

Programme on Space
Applications

UN-SPIDER

ICG

- Members
- Providers' Forum
- Working Groups
- ICG Annual Meetings
- ICG Programme on GNSS Applications
- Resources
- ICG Documents
- Space Weather & GNSS
- Other Events
- ICG Timeline

UN-Space

Space Law

Topics

Photo Gallery

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<http://www.unoosa.org/oosa/en/ourwork/icg/documents/publications.html>



Conclusion

- Significant progress continues to be made through ICG, and the results of this work not only promote the capabilities of GNSS to support sustainable development, but also promote new partnerships among members of ICG and institutions of the broader user community, particularly in developing nations
- The activities and opportunities provided through the ICG result in the development and growth of capacities that will enable each country to enhance its knowledge, understanding and practical experience in those aspects of GNSS technology that have the potential for a greater impact on its economic and social development, including the preservation of its environment
- The ICG is an important vehicle in the multi-lateral arena, as satellite-based positioning, navigation and timing becomes more and more a genuine multinational cooperative venture

THANK YOU



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