

International Committee on Global Navigation Satellite Systems and its activities

**(online) GNSS Data Processing for High Accuracy
Positioning Using Low-Cost Receiver Systems
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**Sharafat Gadimova
Office for Outer Space Affairs**



UNITED NATIONS
Office for Outer Space Affairs



International Committee on GNSS (ICG)

- UNOOSA serves as the executive secretariat of ICG
- Established in 2005, ICG provides a mechanism for multilateral discussion and coordination on GNSS issues of concern
- 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 (BDS), EU (Galileo/EGNOS), Russia (GLONASS/SDCM), United States (GPS/WAAS), India (NavIC/GAGAN), Japan (QZSS/MSAS) and 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, *New Zealand*
- **Associate Members and Observers:** 21 organizations
- **Annual Meetings:** India (2019), Vienna (2021), UAE (2022)
- **Providers' Forum:** *Open Service Information Dissemination, Open Service Performance, Spectrum Protection*
 - *ICG-15 meeting, Vienna, AUSTRIA, 27 September – 1 October 2021*



ICG: Working Groups

- **Systems, Signals and Services (*United States & Russian Federation*):** Compatibility and spectrum protection; interoperability and service standards; system-of-system operations
- **Enhancement of GNSS Performance, New Services and Capabilities (*India, China & ESA*):** Future & novel integrity solutions; implementation of interoperable GNSS Space Service Volume (SSV) and its evolution; examination of performance of atmospheric models, establish dialogue with space weather/RS community
- **Information Dissemination and Capacity Building (*UNOOSA*):** Focused on education and training programmes, promoting GNSS for scientific exploration (incl., space weather and its effects on GNSS)
- **Reference Frames, Timing and Applications (*IAG, IGS & FIG*):** Focused on monitoring and reference station networks

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



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



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/st_space_75E.pdf



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*”

<https://www.unoosa.org/oosa/en/ourwork/icg/resources/Regl-ref.html>





ICG Programme on GNSS applications

- ❖ **United Nations Regional Workshops/training courses on the use and applications of GNSS**
 - *to reinforce the exchange of information between countries and scale up the capacities in the regions for pursuing the application of GNSS solutions;*

- ❖ **Sustainability and modernization of GNSS continuously operating reference stations and geospatial infrastructure through capacity development**
 - *to provide information on the importance of planning and its link to the “why, what and how” of developing long-term capability with respect to GNSS and geospatial infrastructure and related activities*

- ❖ **Space Weather and GNSS**
 - *to describe the science of Space Weather and how to perform ionospheric and Space Weather research with GNSS data*



Conclusion

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

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