

# **International Committee on Global Navigation Satellite Systems and its activities**

**(online) GNSS for Policy and Decision Makers  
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# 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](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*



# ICG Programme on GNSS applications

- ❖ **United Nations Regional Workshops/training courses on the use and applications of GNSS**
  - **Workshop on the Applications of GNSS, Ulaanbaatar, Mongolia, October 2021**
    - *To address a wide array of GNSS applications for socioeconomic benefits and to focus on initiating pilot projects and strengthening the networking of GNSS-related institutions in the region*
    - *ICG's role in GNSS spectrum protection and interference detection and mitigation (WG-S)*
    - *Regional and national reference frames/systems and perspectives for a regional cooperative mechanism (WG-D)*

<https://www.unoosa.org/oosa/en/ourwork/psa/gnss/workshops.html>



# ICG Programme on GNSS applications

## ❖ GNSS data processing (WG-C)

*In cooperation with the Centre for Spatial Information Science at the University of Tokyo, Japan: A series of the training courses held from 2018*

- to provide knowledge about the use of low-cost GNSS receiver systems and Android devices for high-accuracy positioning, survey methods and data processing for high accuracy in real-time or post-processing modes
- to prepare a [handbook on high-accuracy GNSS data processing](#), summarizing data processing techniques, error analysis and various concepts relating to the set-up of base stations, rover units and software

<https://www.unoosa.org/oosa/en/ourwork/icg/activities/2021/CSISTokyo/presentations.html>



# ICG Programme on GNSS applications

## ❖ Space Weather and GNSS (WG-C)

*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*

- **Workshop on GNSS and Space Weather, CRASTE-LF, Rabat, Morocco, October 2021**
- an introduction to ionospheric physics and the science of space weather, including a basic knowledge of GNSS technology and its applications
- to focus on space weather research using GNSS data

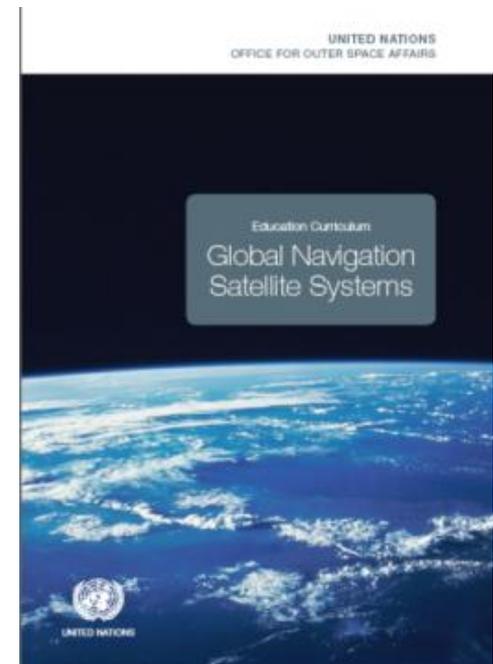
<http://indico.ictp.it/event/9124/other-view?view=ictptimetable>



# ICG Programme on GNSS applications

## ❖ Information Centres for ICG

*The regional centres for space science and technology education, affiliated to the United Nations, in Africa (Morocco and Nigeria), Asia and the Pacific (China and India), Latin America and the Caribbean (Brazil and Mexico) and Western Asia (Jordan)*





## 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*

[WWW.UNOOSA.ORG/OOSA/EN/OURWORK/ICG/ICG.HTML](http://WWW.UNOOSA.ORG/OOSA/EN/OURWORK/ICG/ICG.HTML)

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# THANK YOU



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