

# COSPAR's Contribution to the Scientific Applications of GNSS



**COSPAR**

COMMITTEE ON  
SPACE RESEARCH

**Heike Peter**

PosiTim UG, Germany

**Chair Panel on Satellite Dynamics**

# Committee on Space Research (COSPAR)

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- Created by ICSU in 1958, now affiliated to successor organization ISC
- First Space Science Symposium in Nice in January 1960
- Interdisciplinary scientific organization
- COSPAR's objective is to promote an international scientific research in space, open to all scientists
- All kinds of research carried out with the use of space means (including balloons)
- More details: <https://cosparhq.cnes.fr/>

# The COSPAR World



# COSPAR Publications



COSPAR PUBLICATIONS

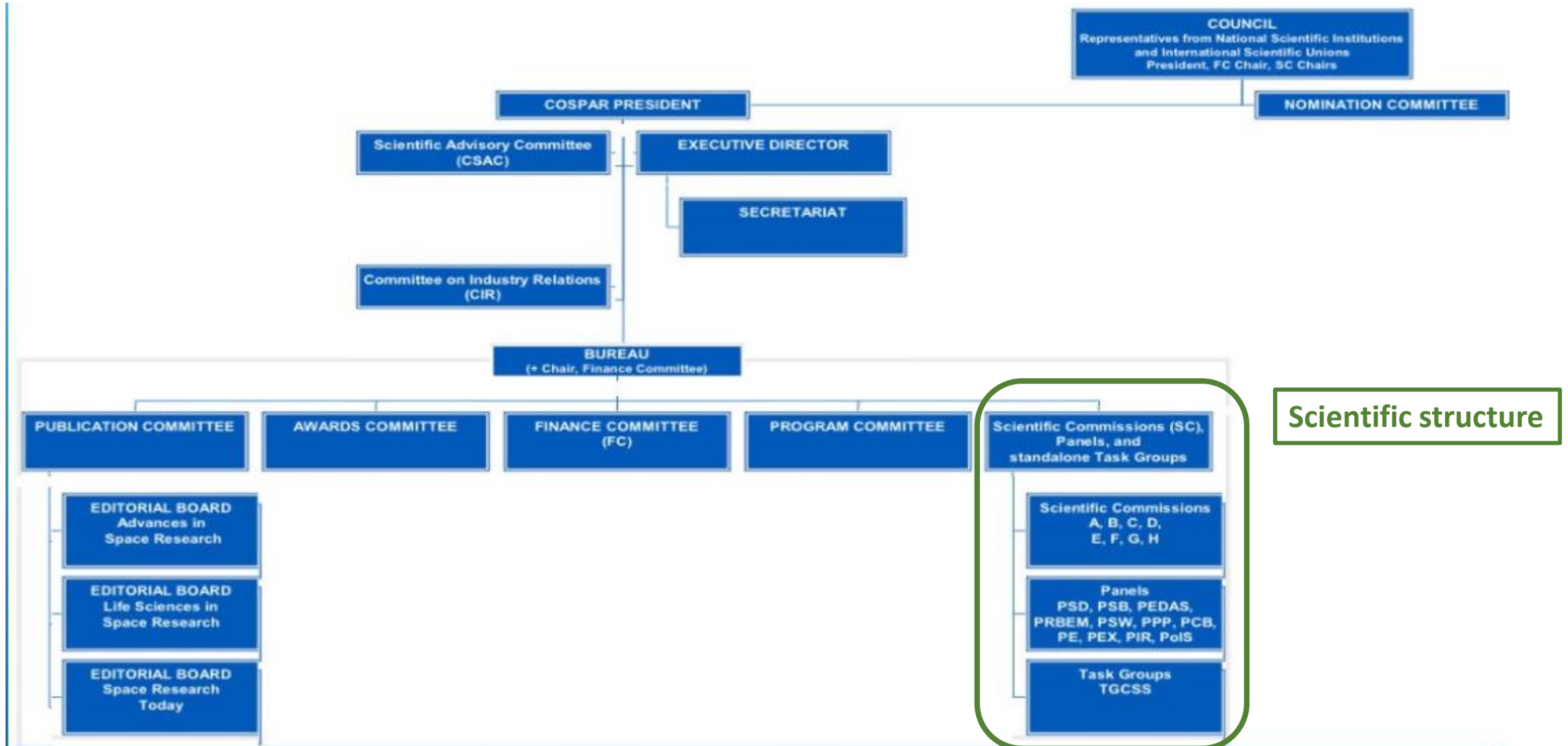
ICG-17, October 15-20, 2023, Madrid, Spain

# Activities

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- Biennial Scientific Assemblies  
=> 45th COSPAR Scientific Assembly, 13-21 July 2024, Busan, South Korea
  - Biennial Symposiums => 2025
  - COSPAR Book Series (starting)
  - Capacity Building Workshops
  - Colloquia and Symposia
  - COSPAR Scientific Roadmaps
  - Participation in the UN and other intergovernmental organizations on space research
  - Promotion of large international collaborative programs and projects of space research
- => Strategic Action Plan 2024-2028** (close to be published)

# COSPAR governance structure



# COSPAR scientific structure

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- Eight scientific commissions (A-H)

- A. **Space Studies of the Earth's Surface, Meteorology and Climate**
- B. **Space Studies of the Earth-Moon System, Planets, and Small Bodies of the Solar System**
- C. **Space Studies of the Upper Atmospheres of the Earth and Planets Including Reference Atmospheres**
- D. Space Plasmas in the Solar System, Including Planetary Magnetospheres
- E. Research in Astrophysics from Space
- F. Life Sciences as Related to Space
- G. Materials Sciences in Space
- H. **Fundamental Physics in Space**

**GNSS related topics**

- Twelve panels

- **Technical Panel on Satellite Dynamics**
- Panel on Technical Problems Related to Scientific Ballooning
- Panel on Potentially Environmentally Detrimental Activities in Space
- Panel on Radiation Belt Environment Modelling
- **Panel on Space Weather**
- Panel on Planetary Protection
- Panel on Capacity Building
- Panel on Education
- Panel on Exploration
- Panel on Interstellar Research
- Panel on Innovative Solutions
- Panel on Space and Social Sciences and Humanities

- Seven Task Groups +1 starting on climate change. One Industry Advisory Committee

# Selected research topics (not complete)

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- Modelling of non-gravitational forces acting on the GNSS satellites – satellite macro models
  - GNSS clock modelling
  - Multi-GNSS processing => LEO precise orbit determination
  - Terrestrial reference frame determination
  - Space weather/ionosphere studies (determination of TEC)
  - Study of plate motion and tectonics in combination with other observation techniques
  - Use of GNSS for lunar missions
  - etc.
- ⇒ Specific GNSS-research related events can be organized at the COSPAR Scientific Assemblies or Symposia



## COSPAR and the United Nations

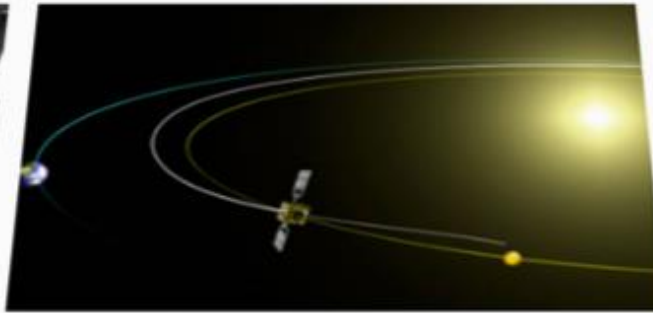
The United Nations Office for Outer Space Affairs (UNOOSA) works to help all countries, especially developing countries, access and leverage the benefits of space to accelerate sustainable development through a variety of activities that cover all aspects related to space, from space law to space applications. UNOOSA provides the Secretariat services to the UN Committee on the Peaceful Uses of Outer Space (COPUOS) and its two Subcommittees, the Scientific and Technical Subcommittee and the Legal Subcommittee. Since its establishment in 1959, COPUOS has been serving as a focal point for international cooperation in the peaceful exploration and use of outer space, maintaining close contacts with governmental and non-governmental organizations concerned with outer space activities. Today, COPUOS has 102 Member States and 45 Observer Organizations ([www.unoosa.org/oosa/en/ourwork/copuos/members/evolution.html](http://www.unoosa.org/oosa/en/ourwork/copuos/members/evolution.html)).

COSPAR was the first organization to be granted an observer status in COPUOS in 1962, and it has worked with UNCOUOS and UNOOSA since then on a variety of topics of joint interest to both organizations, covered under a Memorandum of Understanding.

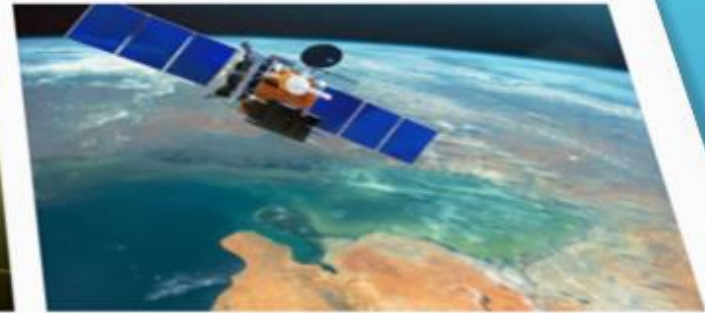
COSPAR resources and activities linked to the United Nations can be found under the links below. Professor Hermann Oppenorth, Vice-Chair of our Panel on Space Weather, is our COSPAR Liaison to the United Nations.



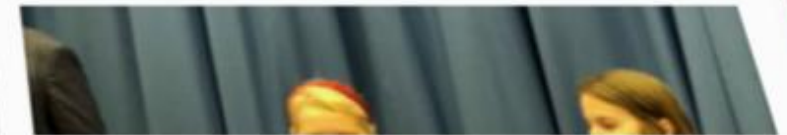
COSPAR fulfills its responsibilities to provide accepted guidelines on planetary protection to guide compliance with the 1967 Outer Space Treaty and other international agreements. This is managed through the work of the COSPAR Panel on Planetary Protection.



COSPAR is an observer in the UNOOSA International Committee on Global Navigation Satellite Systems (ICG), through our Panel on Satellite Dynamics (PSD)



The COSPAR Panel on Potentially Environmentally Detrimental Activities in Space (PEDAS) acts to evaluate environmental impacts by space activities, e.g. space debris, to advise the international community, in particular UNCOUOS



# Next COSPAR meetings

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## *45th COSPAR Scientific Assembly*



*Busan, South Korea*

*July 13-21, 2024*

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*6th COSPAR Symposium*

*2025*

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## *46th COSPAR Scientific Assembly*

*Florence, Italy*

*August 1-9, 2026*