

International Union of Geodesy and Geophysics (IUGG)

Activities' Report - 2022

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1. Introduction

An international, non-governmental scientific organisation, the **International Union of Geodesy and Geophysics** (IUGG, <http://www.iugg.org/>) aims at the advancement, promotion, and coordination of research activities relating to the planet Earth, the space surrounding it, and the processes that regulate its changes. Founded in 1919, the IUGG is part of the International Science Council (ISC, <https://council.science/>).

The Union comprises **eight International Associations**, each of which operates in Earth and space-related fields. The **Associations** are:

- The *International Association of Cryospheric Sciences* (IACS, <https://cryosphericsscience.org/>);
- The *International Association of Geodesy* (IAG, <https://www.iag-aig.org/>);
- The *International Association of Geomagnetism and Aeronomy* (IAGA, <https://iaga-aiga.org/>);
- The *International Association of Hydrological Sciences* (IAHS, <https://iahs.info/>);
- The *International Association of Meteorology and Atmospheric Sciences* (IAMAS, <https://www.iamas.org/>);
- The *International Association for the Physical Sciences of the Oceans* (IAPSO, <https://iapso-ocean.org/>);
- The *International Association of Seismology and Physics of the Earth's Interior* (IASPEI, <http://iaspei.org/>);
- The *International Association of Volcanology and Chemistry of the Earth's Interior* (IAVCEI, <https://www.iavceivolcano.org/>).

Owing to the many interactions between the themes covered and the links between the objectives of the eight Associations, the Union has established six interdisciplinary commissions (<http://www.iugg.org/about/commissions/>) dealing with:

- *Climatic and Environmental Changes* (CCEC, <https://iugg.org/associations-commissions/commissions/cceg/>);
- *Mathematical Geophysics* (CMG, <https://iugg.org/associations-commissions/commissions/cmig/>);
- *Geophysical Risk and Sustainability* (GRC, <https://iugg.org/associations-commissions/commissions/grc/>);
- *Study of the Earth's Deep Interior* (SEDI, <https://iugg.org/associations-commissions/commissions/sedi/>).

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- *Data and Information* (UCDI, <https://iugg.org/associations-commissions/commissions/ucdi/>);
- *Planetary Sciences* (UCPS, <https://iugg.org/associations-commissions/commissions/ucps/>).

For the 4-year period 2019-2022, the Italian National representatives to the Union and its eight Associations are:

- Fausto GUZZETTI, Claudia PASQUERO substitute, for the *International Union of Geodesy and Geophysics* (IUGG),
- Barbara STENNI, Giovanni MACELLONI substitute, for the *International Association of Cryospheric Sciences* (IACS),
- Mattia CRESPI, Paolo MESSINA substitute, for the *International Association for Geodesy* (IAG),
- Umberto VILLANTE, Luigi VIGLIOTTI substitute, for the *International Association of Geomagnetism and Aeronomy* (IAGA/IUGG),
- Alberto MONTANARI, Tommaso MORAMARCO substitute, for the *International Association of Hydrogeological Sciences* (IAHS/IUGG),
- Marcello MIGLIETTA, Massimiliano PASQUI substitute, for the *International Association of Meteorological and Atmospheric Sciences* (IAMAS/IUGG),
- Katrin SCHROEDER, Andrea CUCCO substitute, for the *International Association of Physical Sciences of the Ocean* (IAPSO/IUGG),
- Warner MARZOCCHI, Andrea ARGNANI substitute, for the *International Association of Seismology and Physics of Earth's Interior* (IASPEI/IUGG),
- Giuseppe DE NATALE, Claudia PRINCIPE substitute, for the *International Association of Volcanology and Chemistry of the Earth's Interior* (IAVCEI/IUGG).

2. Main IUGG activities in 2022 relevant for Italy and for CNR

In 2002, the Union continued and strengthened the information and coordination activities of its Associations, and with other international scientific organisations, chiefly with the International Science Council (ISC, <https://council.science/>), of which the IUGG and the CNR are members.

The development and updating of the Union's website (<https://iugg.org/>) and the publication of the monthly electronic newsletters, available at <https://iugg.org/publications/ejournals/>, continued. Cecilia LALLE, of the CNR's Unità Relazioni Internazionali, informed the members of the CNR IUGG National Commission about the publication of the newsletters, summarising the most interesting contents.

The organisation of the 28th General Assembly of the Union, to be held in Berlin from 11 to 20 July 2023, continued. The programme and information on the General Assembly are available at <https://www.iugg2023berlin.org/>. Preparatory activities

for the General Assembly were carried out, including those related to the renewal of the Union elective offices, which will take place during the General Assembly in July 2023. Information and calls for the open positions were announced and published on the Union's website and in the monthly newsletters.

In accordance with Union' rules, the deadline for proposals to host the 29th General Assembly, in 2027, was set at 11 January 2023, six months before the 28th General Assembly.

On 7 November 2022, the Union's Early Career Scientist Award winners were announced, and they are:

- Mohd Farooq AZAM, Indian Institute of Technology, India.
- Jana H. BÖRNER, Freiberg University of Mining and Technology, Germany.
- Jayashree BULUSU, Indian Institute of Geomagnetism, India.
- Johan GAUME, Swiss Federal Institute of Technology, Switzerland.
- Jose Tàrsilo GIRONA HERNANDEZ, University of Alaska Fairbanks, USA.
- Natalya GOMEZ; McGill University, Canada.
- Patrick HUPE, Federal Institute for Geosciences and Natural Resources, Germany.
- Christina KARAMPERIDOU, University of Hawaii, USA.
- Xingxing LI, Wuhan University, China.
- Norimitsu NAKATA, Lawrence Berkeley National Laboratory and Massachusetts Institute of Technology, USA.

Katrin SCHRÖDER, IAPSO national representative, chaired the Early Career Scientist Award selection committee.

In 2022, the IUGG supported the following 13 international scientific meetings, one of which was held in L'Aquila, Italy:

- 2nd World Conference on Meteotsunamis, Minorca, 18-20 May.
- 1st Workshop on Data Science for GNSS Remote Sensing, Potsdam, 13-15 June.
- 7th International Meeting on Terrestrial Heat Flow and the Thermal Structure of the Lithosphere, Potsdam, 20-22 June.
- International Radiation Symposium 2022, Thessaloniki, 4-8 July.
- 8th IAGA/ICMA/SCOSTEP Workshop on Vertical Coupling in the Atmosphere-Ionosphere System, Sopron, 11-15 July.
- 44th COSPAR Scientific Assembly, Atene, 16-24 July.
- 3rd European Conference on Earthquake Engineering and Seismology, Bucharest, 4-9 September.
- International Mountain Conference 2022, Innsbruck, 11-15 September.
- 100th Anniversary of German Geophysical Society, Berlin, 19-25 September.
- 8th SOLAS Open Science Conference, Cape Town, 25-30 September.

- International School of Space Science, Course on Radiation Belt Dynamics and Remote Sensing of the Earth's Plasmasphere, L'Aquila, 26-30 September.
- 4th Regional Assembly Latin American and Caribbean Seismological Commission, Quito, 3-5 October.
- 14th General Assembly of the Asian Seismological Commission, Egypt, 20-21 October.

Ultimately, it is noteworthy that following the war activities in Ukraine, the Union, in a statement published on April 1st, 2022, expressed its "*deep dismay and concerns regarding the military offensives being carried out in Ukraine and warns against the severe outcomes that conflict will have on the research and academic community*". The statement is available at https://iugg.org/wp-content/uploads/2022/04/Statement_Ukraine.pdf.

3. Activities carried on as Italian delegate within the Union during 2022

In March 2022, following a consultation with Warner MARZOCCHI, national representative in IASPEI, I nominated Stefano PAROLAI as Italian titular member in the European Seismological Commission.

In May 2022, on the proposal of Umberto VILLANTE, national representative in IAGA, and after hearing the CNR IUGG Commission, I proposed Alessio PIGNALBERI for the IUGG Early Career Scientist Award. Ultimately, the proposal was not accepted by the award committee.

In September 2022, after consultation with the CNR IUGG Commission, I proposed Paolo PAPALE for the IUGG Fellowship. Ultimately, the proposal was accepted by the award committee. Paolo PAPALE is the 5th Italian to receive the prestigious award.

During 2022, no requests for votes or Council decisions were received from the Presidency or the Secretariat of the Union.

4. Evaluation of the participation in terms of benefits and membership cost

The Union and its eight Associations cover research areas of considerable interest to the national Italian academic and scientific community in the broad and diverse field of the Earth and space sciences. Directly and through the single Associations, the Union contributes to the research governance in the Earth and space sciences, including the promotion of inter-Association commissions and relationships with other scientific bodies in neighbouring or complementary science fields. In the Associations and in specific interdisciplinary commissions, the Italian National representatives have had and can have a relevant role in promoting Italian research and in fostering international cooperation and synergies.

The Italian academic community can contribute to the promotion of proposals for Union' resolutions of interest, such as the proposed resolution on the allocation of dedicated frequencies for Very Long Baseline Interferometry, which is of

paramount importance for organisations operating continental and international networks, with relevant scientific and practical consequences.

The Union promotes young researchers in the field of Earth and space sciences through support programmes and awards.

The membership fee paid by the *Consiglio Nazionale delle Ricerche* to the Union covers the participation in the Union's activities and its eight Associations, which therefore have no additional membership costs. This is particularly important for the newer Associations, which need support to grow and establish themselves as reference points in the Italian scientific community.

5. Assessments of Italian participation with proposals to enhance interest and involvement

The Italian academic and scientific community working in the broad field of the geosciences and the space sciences is strongly involved in the Union scientific and organizational activities, and in the activities of the eight international Associations, as well as in other scientific, technical and research organisations, chiefly - but not exclusively - in the European Geosciences Union (EGU) and the American Geophysical Union (AGU).

A greater involvement of the Italian community in the Union's interdisciplinary Commissions would be beneficial, as well as a stronger proactivity in proposing scientific events and meetings for possible support by the Union.

For the 4-year period 2019-2022, the CNR IUGG National Commission has proposed, within the Union and its Associations, and within other international scientific organisations, the nomination of its representatives for international scientific prizes and awards. This activity, which is important for enhancing the reputation of the Italian national academic and scientific community, should be pursued with even greater determination in the future.

6. Prizes awarded to Italian scientists

The following three Italian scientists have obtained scientific awards in fields close to the Associations that make up the Union:

- Elisabetta ERBA, 2022 Jean Baptiste Lamarck Medal, of the European Geosciences Union.
- Francesca FUNICELLO, 2022 Marie Tharp Medal, of the European Geosciences Union.
- Paola PASSALACQUA, 2022 Ralph Alger Bagnold Medal, of the European Geosciences Union.

In addition, Tommaso ALBERTI, received the 2022 Division Outstanding Early Career Scientist Award from the European Geosciences Union.

Finally, the following scientific awards to Italian researchers were announced in 2022:

- Paolo PAPALE will be appointed IUGG Fellow in 2023.
- Maurizio FEDI will receive the 2023 Christiaan Huygens Medal, from the European Geosciences Union.
- Alberto VIGLIONE will receive the 2023 Plinius Medal, of the European Geosciences Union.
- Angelo VULPIANI will receive the 2023 Lewis Fry Richardson Medal, of the European Geosciences Union.

7. Summary of the Commission's activities

In 2022, the Commission met twice, electronically, on 24 August and 13 September, to analyse the applications received for the IUGG Fellowship. Based on the analysis, the Commission instructed the President to support the candidature of Paolo PAPALE as IUGG Fellow.

At the request of the Union Secretariat, the Commission sent the updated information on the Italian National Committee for publication in the IUGG Yearbook 2023.

8. Final remarks and acknowledgements

The four-year period 2019-2022 of the CNR IUGG Commission was marked by the COVID-19 pandemic, which limited some research activities - in particular, field measurement campaigns - and the organisation of congresses, conferences, workshops, and schools. Despite the difficulties, all the international Associations and the Union were able to carry out important scientific and research activities, as well as conferences and meetings. This is demonstrated by the reach programme of the 28th General Assembly, which comprises 4 Union symposia, 54 inter-Association symposia, and 140 Association symposia.

At the end of the Commission's four-year term 2019-2022, I would like to thank my colleagues for their continued cooperation, especially during the difficult and uncertain period characterised by the global pandemic.

I would also like to thank the CNR's Unità Relazioni Internazionali and its Head, Virginia CODA NUNZIANTE, for the persistent support.

Special thanks go to Cecilia LALLE, of the CNR's Unità Relazioni Internazionali, who managed the Commission's secretariat with competence, dedication, and unique interpersonal skills. Her work has been invaluable to the activities of the committee.

Fausto Guzzetti

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