

International Union of Geodesy and Geophysics (IUGG)

Activities' Report - 2021

Fausto Guzzetti

1. Introduction

The **International Union of Geodesy and Geophysics** (IUGG, <http://www.iugg.org/>) is the international non-governmental scientific organisation concerned with the advancement, promotion, and coordination of research activities - physical, chemical, and mathematical - 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).

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://cryosphericciences.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 topics covered and the links between the research objectives of the eight Associations, the Union has established six interdisciplinary thematic commissions (<http://www.iugg.org/about/commissions/>) dealing with:

- Climatic and Environmental Changes (CCEC);
- Mathematical Geophysics (CMG);
- Geophysical Risk and Sustainability (GRC);
- Study of the Earth's Deep Interior (SEDI);

- Data and Information (UCDI);
- Planetary Sciences (UCPS).

The National Representatives to the **International Union of Geodesy and Geophysics** and its **eight international associations** (IACS, IAG, AIGA, IAHS, IAMAS, IAPSO, IASPEI, IAVCEI) are:

For the **International Union of Geodesy and Geophysics** (IUGG), Fausto GUZZETTI delegate, Claudia PASQUERO substitute.

For the **International Association of Cryospheric Sciences** (IACS) Barbara STENNI delegate, Giovanni MACELLONI substitute.

For the **International Association for Geodesy** (IAG), Mattia CRESPI Delegate, Paolo MESSINA substitute.

For the **International Association of Geomagnetisms and Aeronomy** (IAGA/IUGG), Umberto VILLANTE delegate, and Luigi VIGLIOTTI substitute.

For the **International Association of Hydrogeological Sciences** (IAHS/IUGG), Alberto MONTANARI delegate, Tommaso MORAMARCO substitute.

For the **International Association of Meteorological and Atmospheric Sciences** (IAMAS/IUGG), Marcello MIGLIETTA delegate, Massimiliano PASQUI substitute.

For the **International Association of Physical Sciences of the Ocean** (IAPSO/IUGG), Katrin SCHROEDER delegate, Andrea CUCCO substitute.

For the **International Association of Seismology and Physics of Earth's Interior** (IASPEI/IUGG), Warner MARZOCCHI delegate, Andrea ARGNANI substitute.

For the **International Association of Volcanology and Chemistry of the Earth's Interior** (IAVCEI/IUGG), Giuseppe DE NATALE delegate, Claudia PRINCIPE substitute.

2. **Main activities carried on by the IUGG during 2021 relevant for Italy and for CNR**

As in the previous year, also in 2021 the Covid-19 pandemic limited the Union's activities and those regarding national and international meetings, some of which were cancelled and others postponed to 2022 or 2023.

Despite the inherent difficulties, the Union has continued its information and coordination activities with the Associations, and with other international scientific organisations, including the International Science Council (ISC, <https://council.science/>) of which both the IUGG and CNR are members.

During 2021, the publication of the monthly Newsletters by the Union has continued (<https://iugg.org/publications/ejournals/>). Cecilia Lalle (CNR "Unità Relazioni Europee e Internazionali") as Commission Secretariat, promptly

informed by email the CNR - IUGG National Commission of the publication of the newsletters, always summarising the most relevant contents.

In 2021, the IUGG has selected 5 international scientific meetings for Union support, none of which in Italy:

- 43rd COSPAR Scientific Assembly, Sydney, Australia, 28 January-4 February;
- International Conference on Clouds and Precipitation, virtual, 3-7 August;
- 13th General Assembly of the Asian Seismological Commission, virtual, 21-27 August;
- 37th General Assembly of the European Seismological Commission, virtual, 19-24 September;
- International Ozone Commission Quadrennial Ozone Symposium, virtual, 3-9 October.

In 2021, the Union has chosen to promote and support 13 international scientific meetings which will be held in 2022. (<http://www.iugg.org/meetings/sponsored.php>). Among them, the International School of Space Science - Course on Radiation Belt Dynamics and Remote Sensing of the Earth's Plasmasphere, which will be held in L'Aquila, Italy, from 26 to 30 September 2022 (<https://www.cifs-iss.org/>).

3. Activities carried on by the Italian Delegate within the Union during 2021 and impact on the Italian scientific community

In 2021, my activities as national representative of the IUGG were still severely limited by the continuation of the Covid-19 pandemic.

My current position as Director of Office II, Technical and Scientific Activities for Risk Prediction and Prevention of the National Civil Protection Department has given me an insight into the use of scientific research and technological development on natural and man-made hazards and their consequences. I consider this activity of primary interest to the IUGG, both nationally and internationally.

During 2021, there were no requests from the President for internal Union votes, as was the case in 2020.

Following consultation with the national CNR - IUGG Commission, I formally supported the candidature of Mario MALINCONICO for the governing board of the International Science Council (ISC) for the period 2021-2024. Having joined the Governing Board of the ISC, Mario MALINCONICO passed away prematurely in August 2021.

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

The Union and its eight international Associations cover research areas of undoubted and permanent interest for Italian research in the broad domain of "Geosciences" and space sciences. Directly and through the International

Associations, the Union contributes to the international governance of research in the Geosciences and Space Sciences, also by promoting inter-association commissions and maintaining relations with other scientific bodies operating in neighbouring or complementary fields. In the inter-associations and in specific interdisciplinary commissions, national representatives have had and may have relevant roles, contributing to the promotion of Italian research, fostering international cooperation and synergies.

With specific support and recognition programmes, the Union promotes young researchers in the field of Geosciences and Space Sciences.

During the last four years, most of which have been marked by the pandemic, the Union has continued to organise meetings and support scientific and dissemination initiatives, thus becoming a global reference point in the vast field of Geosciences.

The CNR membership fee to the IUGG covers both participation in the activities of the Union and in its eight international Associations, which therefore have no additional membership costs. This is particularly relevant for the younger Associations, which are not yet well established in Italy, and which need organisational support to grow and establish themselves as reference points in the Italian scientific community.

5. Evaluation of Italians' attendance and how to improve interest and involvement

The Italian scientific community in the domains of the Geosciences and the Space sciences continues to be significantly involved in the activities of the Union, at both organisational and scientific levels. In this regard, the reader may also check the list of Italian researchers contributing to international scientific associations reported in section 6, and the similar information that can be obtained from the reports of the national representatives in the eight International Associations contributing to the IUGG (<https://www.cnr.it/it/organismi-scientifici-internazionali>).

The Italian Geosciences and Space Research communities are also active in other scientific, technical, and research organisations that operate in fields close to those addressed by the Union and its Associations, and in particular - although not limited to - in the European Geosciences Union (EGU) and the American Geophysical Union (AGU).

6. Italian experts with important roles within the Union or within related Commissions and Programs, or in related scientific Unions

The following Italian researchers participate in leading positions to the Union, in related committees and programmes, and in the activities of other scientific associations related to the activities of the Union and its associations.

- Alberto ARMIGLIATO is member of the Joint Tsunami Commission (IAPSO/IASPEI/IAVCEI)

- Carlo BARBANTE is national delegate in the IUGG International Arctic Science Committee (IASC) and national representative in the European Polar Board;
- Carlo BARONI, is national representative in the Scientific Committee on Antarctic Research (SCAR) is the Italian focal point of the Global Cryosphere Watch of the WMO (GCW-WMO; <https://globalcryospherewatch.org/about/focalpoints.html>), national correspondent of the WGMS (World Glacier Monitoring Service; <https://wgms.ch/contact-ncs/>), national representative of the Standing Committee on Antarctic Geographic Information (SCAGI) at SCAR (<https://www.scar.org/resources/scagi/members/>), member of the CNR-IUGS (International Union of Geological Sciences).
- Giorgio BUDILLON is national representative in the Southern Ocean Observing System (SOOS), and National representative for Physical Sciences in the Scientific Committee on Antarctic Research (SCAR).
- Sandro CARNIEL is vice president of the EGU Division on Division on Ocean Sciences (EGU OS).
- Attiglio CASTELLARIN is Editor in Chief of the IAHS Hydrological Sciences Journal.
- Mattia CRESPI is national delegate in the International Association for Geodesy (IAG).
- Raffaella D'AMICIS is vice-Chair del Panel on Capacity Building (PCB), Committee on Space Research (COSPAR).
- Giorgiana DE FRANCESCHI is Chair of the Scientific Committee on Antarctic Research (SCAR) expert group on GNSS Research and Application for Polar Environment (GRAPE), and vice-chair of the Committee G of the Union Radio-Scientifique Internationale (URSI).
- Giuseppe DE NATALE is national delegate in the International Association of Volcanology and Chemistry of the Earth's Interior (IAVCEI/IUGG).
- Angelo DE SANTIS is member of the ASI Committee on ESA satellite Earth Observation Missions.
- Maria Cristina FACCHINI is member of the International Commission on Atmospheric Chemistry and Global Pollution (ICACGP).
- Aldo FIORI is president of the International Commission for Ground Water, International Association of Hydrological Sciences (ICGW/IAHS).
- Fabio FLORINDO is president of the EGU Division of Earth Magnetism & Rock Physics (EGU-EMRP), and Chair of the Working Group I.2 "Paleomagnetism" Division I - Internal Magnetic Fields of IAGA.
- Salvatore GRIMALDI is vice president of the International Association of Hydrological Sciences.

- Teodoro GEORGIADIS is member of the Capacity Building and Education Committee of the IUGG.
- Fausto GUZZETTI is national delegate in the International Union of Geodesy and Geophysics, and President of the National Commission CNR – IUGG.
- Giovanni MACELLONI is alternate national delegate in the International Arctic Science Committee, Italian Focal point for the Global Cryosphere Watch of the World Meteorological Organization (GCW-WMO) and national representative in the Scientific Committee on Antarctic Research (SCAR).
- Warner MARZOCCHI is national delegate in the International Association of Seismology and Physics of Earth's Interior (IASPEI/IUGG).
- Antonio MELONI is president of the National Scientific Commission for Antarctica.
- Daniela MELONI is member of the International Radiation Commission (IRC).
- Alberto MONTANARI is president of the European Geosciences Union (EGU) and national representative in the International Association of Hydrological Sciences (IAHS).
- Marcello MIGLIETTA is national representative in the International Association of Meteorological and Atmospheric Sciences (IAMAS/IUGG);
- Fernando NARDI is president of the Citizen and Hydrology Working Group (CandHy WG) of the International Association of Hydrological Sciences.
- Claudia PASQUERO is member of the IUGG Commission on Mathematical Geophysics (CMG).
- Christina PLAINAKI is Secretary of the International Commission on Planetary Atmospheres and their Evolution (ICPAE).
- Silvano ONOFRI is president of the National Scientific Commission for Antarctica.
- Stefano PAROLAI is national member of the European Seismological Commission.
- Paolo PORTO is president elect in the International Commission on Continental Erosion of the International Association of Hydrological Sciences (ICCE/IAHS).
- Ilaria PROSDOCIMI is secretary of the International Commission on Statistical Hydrology of the International Association of Hydrological Sciences (ICSH/IAHS).
- Paola RIVARO is national representative in the Southern Ocean Observing System (SOOS).

- Vincenzo ROMANO is national expert in the UN Committee on the Peaceful Uses of Outer Space (COPUOS), and Italia co-coordinator of the International Space Weather Initiative (ISWI).
- Dario SABBAGH is national delegate in the Commission G Ionospheric Radio and Propagation of the Union Radio-Scientifique Internationale (URSI).
- Katrin SCHROEDER is national delegate in the International Association for the Physical Sciences of the Oceans (IAPSO), and Chair of the IUGG Early Career Scientists Award Committee.
- Francesco SOLDOVIERI is vice president of the EGU Division on Division on Geosciences Instrumentation and Data Systems (EGU GI).
- Stefania SPARNOCCHIA is secretary general of the International Association for the Physical Sciences of the Oceans (IAPSO), and liaison officer of the IUGG/IAPSO to the UNESCO Intergovernmental Oceanographic Commission.
- Barbara STENNI is national delegate in the International Association of Cryospheric Sciences (IACS).
- Roberto SULPIZIO is Secretary and member of the Executive Committee of the International Association of Volcanology and Chemistry of the Earth's Interior (IAVCEI), and member of the Scientific Program Committee (SPC) for the IUGG General Assembly 2023 (IUGG2023).
- Paolo TAROLLI is vice president of the EGU Division on Natural Hazards (EGU NH).
- Flavia TAURO is president of the Working Group Measurements & Observations in XXI Century (MOXXI) of the International Association of Hydrological Sciences (IAHS).
- Elena THOT is vice president of the EGU Division on Hydrological Sciences (EGU HS).
- Stefano TINTI is member of the Joint Tsunami Commission of the International Association for the Physical Sciences of the Oceans (IAPSO), International Association of Seismology and Physics of the Earth's Interior (IASPEI), and International Association of Volcanology and Chemistry of the Earth's Interior (IAVCEI).
- Paola VANNUCCI is president of the EGU Division on Tectonics and Structural Geology (EGU TS).
- Umberto VILLANTE is president of the Space Weather Italian Community (SWICo) and national delegate in the International Association of Geomagnetism and Aeronomy (IAGA/IUGG).
- Sergio VINCIGUERRA is vice president of the EGU Division on Earth Magnetism & Rock Physics (EGU EMRP).

- Elena VOLPI is “president elect” of the International Commission on Statistical Hydrology of the International Association of Hydrological Sciences (ICSH/IAHS).
- Claudio ZACCONE is president of the EGU Division on Soil System Sciences (EGU SSS).
- Filippo ZANNIBONI is member of the Joint Tsunami Commission (IAPSO/IASPEI/IAVCEI).

The following Italian scientists have obtained scientific awards in fields specific to the Associations that constitute the Union:

- Giuliano DI BALDASSARRE, 2021 Plinius Medal, awarded by the European Geosciences Union.
- Giorgia DALLA SANTA, 2021 Energy, Resources and the Environment Division Outstanding Early Career Scientist Award, awarded by the European Geosciences Union.
- Fabio FLORINDO, has become Fellow of the American Geophysical Union.
- Matteo GIULIANI, 2021 Hydrological Sciences Division Outstanding Early Career Scientist Award, awarded by the European Geosciences Union.
- Roberto PIERDICCA, 2021 Geosciences Instrumentation and Data Systems Division Outstanding Early Career Scientist Award, awarded by the European Geosciences Union.
- Maria PREGNOLATO, 2021 Natural Hazards Division Outstanding Early Career Scientist Award, awarded by the European Geosciences Union.
- Alessio PIGNALBERI, 2021 Young Scientist Award of the International Union of Radio Science.

In addition, the following scientific awards were announced in 2021 to be formally awarded in 2022:

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

7. Summary of the Commission's 2020 activities

During 2021, the Commission met twice, on 4 April and 20 December.

- During the meeting of April 4, were discussed (i) the activities carried out by the individual Associations during 2020, and those planned for 2021; (ii) the opportunity to submit nominations for prizes and awards in the IUGG and in international Associations; (iii) the planning of the Commission's activities in

2021; and (iv) the support of the CNR - IUGG Commission to the candidacy of Mario MALINCONICO for the Governing Board of the International Science Council (ISC). During the meeting of 20 December, the activities of the 8 International Associations were presented and discussed.

In addition, the Commission, on request of the IUGG Secretariat, sent updated Italian Commission information for the IUGG Yearbook 2021.

8. Conclusions

The third year of activity of the National Commission CNR - IUGG, like that of many of the Associations that compose the Union, was still penalised by the Covid-19 pandemic emergency. Reading the reports of the individual Associations (available @ <https://www.cnr.it/it/organismi-scientifici-internazionali>) reveals significant effects of the pandemic, connected with the impossibility of holding scientific and technical meetings in person, the difficulty of carrying out training activities, and the difficulty of some Associations in planning and carrying out measurement activities and survey campaigns. Albeit with continuing uncertainties, the individual Associations, and the Union as a whole, have started to plan their activities again, mostly remotely or in a “blended” format. Despite the difficulties, for many of the Associations the scientific production and the quality of the results remain at a high, or very high, level.

Fausto Guzzetti

Rome, May 7th, 2022