

IAPSO-IUGG

Activities' Report - Year 2023

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1. Introduction

IAPSO, the International Association for the Physical Sciences of the Oceans, is one of the eight associations of IUGG, the International Union of Geodesy and Geophysics, which represents the international physical ocean science community. IAPSO organizes biennial conferences that coincide with IUGG General Assemblies every four years, as well as commissions, committees, and workshops on original and current research topics. IAPSO also participates in the activities of SCOR (Scientific Committee on Oceanic Research), with which it has organized a number of joint working groups. IAPSO also provides basic services to the research community, such as the Permanent Service for Mean Sea Level and the IAPSO Standard Seawater Service, which serves as a reference for calibrating seawater salinity measurements. As of April 2022, IAPSO has a new website (<https://iapso-ocean.org>) and Facebook page (<https://www.facebook.com/iapso.iugg.org>).

IAPSO plays an important role in advancing oceanographic research through its various programs and initiatives. This report examines IAPSO's activities relevant for Italy during 2023, highlighting key achievements and areas for potential improvement. We also analyze Italian participation in the 28th IUGG General Assembly held in Berlin, Germany, from July 11-20, 2023. Furthermore, this report explores valuable contributions from Italian scientists. We will also investigate the involvement of Italian scientists in IAPSO leadership roles and committees.

The above activities have important implications also at the national level, and the participation of the Italian community in the regular meetings - in greater numbers when they take place in European countries - is both an opportunity to meet the international reference community and a place to improve the visibility of research activities carried out in national academies or research institutions.

By examining these aspects, this report aims to provide a comprehensive overview of IAPSO's activities in Italy and identify opportunities for increased engagement from the Italian scientific community.

2. Main activities carried on by IAPSO during 2023 relevant for Italy and for CNR

The IAPSO undertook several activities in 2023 that hold significant relevance for Italy and the National Research Council (CNR). Here, we'll explore key initiatives with specific connections to the Italian scientific community:

- IAPSO Best Practice Study Groups (BPSGs, <https://iapso-ocean.org/funding-opportunities/best-practices-study-groups.html>): CNR researchers participated in two successful proposals within the IAPSO BPSG program. These groups will kick off in 2024 and focus on:
 - o Ship-based CTD/O₂ operations, calibration, and processing procedures. This BPSG directly aligns with CNR's expertise in oceanographic instrumentation and data collection methodologies.
 - o Calibrating Measurements of Total Dissolved Inorganic Carbon in Seawater. This group's work is highly relevant to CNR's research on ocean acidification and biogeochemical cycles in the marine environment.
- Early Career Scientist Working Group (ECSWG, <https://iapso-ocean.org/activities/working-groups.html>): IAPSO's ECSWG provides valuable opportunities for young Italian oceanographers to network, develop their careers, and participate in international scientific exchange. Continued promotion of the ECSWG within Italy, potentially through CNR-affiliated channels, is recommended to foster greater Italian involvement.
- 28th IUGG General Assembly: The Assembly offered a platform also for Italian scientists to present their research, participate in discussions on critical oceanographic topics, and connect with international colleagues.

By actively engaging with IAPSO's programs and initiatives, CNR and the Italian oceanographic community can position themselves at the forefront of scientific discovery and contribute to advancing our understanding of the global ocean.

The new Italian Research Vessel Gaia Blu is still undergoing re-equipment and in fall 2023 CNR conducted an extensive test cruise in the Ionian Sea (Pioneer cruise, https://www.cnr.it/it/Gaia_Blu_Pioneer, and DOI: 10.26383/CNR-ISMAR.2024.2). The ship is expected to be fully operational for the Italian oceanographic community by fall 2024.

In 2023, field campaigns were designed and initiated in Western Mediterranean coastal waters to collect and map Essential Ocean Variables (EOVs) at high frequency for testing and validating operational ocean prediction systems focused on the coastal scale. This activity serves as a preliminary step to establish the necessary accuracy thresholds for Ocean Prediction Products at the coastal scale.

3. Activities carried on by Italian Delegate within the Union during 2023 and impact on the Italian scientific community

With the aim of improving Italian participation qualitatively and quantitatively, it is necessary to provide better access to information. To this end, there is a mailing list of Italian scientists associated with IAPSO to which one can subscribe at any time (instructions are published here: <https://www.cnr.it/it/organismo-scientifico-internazionale/38/iapso-iugg-international-association-of-physical-sciences-of-the-oceans>). This list is used by the Delegate and the Alternate to easily disseminate information and communications relevant to IAPSO and to collect contributions for the regular reports on Italian scientific activities within IAPSO. This list was used to disseminate the most important IAPSO news and to collect the possible nominations for the Awards. Also thanks to this dissemination, the following has become possible and Italian scientists actively participated in several IAPSO programs and initiatives in 2023, contributing to the advancement of oceanographic research:

- Best Practice Study Groups (BPSGs): As highlighted earlier, CNR's successful proposals for the BPSG program demonstrate Italian expertise in specific areas of oceanographic research methodologies. These projects will directly benefit the Italian scientific community by:
 - Developing standardized protocols: The BPSG outcomes will provide valuable resources for Italian researchers, ensuring consistency and quality in data collection and analysis practices.
 - Enhancing knowledge sharing: Italian scientists involved in the BPSG projects will gain valuable insights from international colleagues, leading to improved research approaches and methodologies within Italy.
- 28th IUGG General Assembly: Italian scientists presented their research findings and participated in discussions at the Assembly. This exposure to the international oceanographic community fosters knowledge exchange and can lead to potential collaborations on future research projects.
- Early Career Scientist Working Group (ECSWG): Italian participation in the ECSWG provides a platform for young researchers to:
 - Develop their professional networks: Interaction with international peers fosters career development and collaboration opportunities.
 - Stay updated on current trends: The ECSWG offers access to workshops, webinars, and resources on emerging topics in oceanography, keeping Italian early-career scientists at the forefront of their field.

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

IAPSO membership offers a multitude of benefits for the Italian scientific community, justifying any associated costs. Here's a closer look at the key advantages:

- Enhanced research visibility: IAPSO events and publications provide a platform for Italian scientists to showcase their research to a global audience, fostering international recognition and potential collaborations.

- Access to expertise and resources: IAPSO facilitates knowledge exchange and networking with leading oceanographers worldwide. Italian researchers gain access to valuable resources, best practices, and ongoing advancements in the field.
- Participation in standard Setting: Italy, through its IAPSO membership, can contribute to shaping international standards and protocols for oceanographic research. This ensures alignment with global best practices and enhances the quality and comparability of Italian research data.
- Career development opportunities: The ECSWG provides a supportive network and career development resources specifically tailored for young Italian oceanographers. This fosters the next generation of Italian leaders in the field.
- Influence on research priorities: Italian participation in IAPSO committees and working groups allows the country to influence research priorities and ensure alignment with national scientific goals.

The benefits outlined above suggest that the costs likely represent a sound investment in the development and international standing of Italian oceanographic research.

To further optimize the return on investment from IAPSO membership, here are some lines to direct future actions of the National Representative:

- Promote IAPSO benefits and opportunities: Targeted communication campaigns through CNR channels and national scientific associations can raise awareness of IAPSO's offerings among Italian oceanographers.
- Encourage participation in IAPSO programs: Italian scientists should be encouraged to actively participate in programs like BPSGs, working groups, and conferences. This fosters knowledge exchange and strengthens Italy's voice within IAPSO.
- Track and measure engagement: CNR can develop mechanisms to track Italian participation in IAPSO activities and measure the impact on the national scientific community. This will help assess the effectiveness of current strategies and identify areas for improvement.

Through these targeted actions, Italy can maximize the benefits of its IAPSO membership and solidify its position as a leader in global oceanographic research.

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

While a definitive analysis requires further investigation, some potential factors influencing Italian attendance at IAPSO events include: limited awareness (Italian oceanographers may not be fully aware of the benefits and opportunities offered by IAPSO membership) and travel costs (participating in international conferences can be financially challenging for some researchers).

To encourage greater participation from the Italian scientific community, it could be necessary to enhance communication (with targeted communication through CNR channels and national scientific associations), provide financial support (explore options for national or institutional funding to support travel costs for promising young Italian scientists attending IAPSO events, especially if they happen outside Europe; and investigate potential IAPSO travel grants or fellowships for Italian researchers), capacity development (organize national workshops or seminars to introduce IAPSO and its benefits to the Italian scientific community), nomination encouragement (encourage Italian scientists to nominate themselves or colleagues for leadership roles within IAPSO committees and working groups, and promote Italian proposals for hosting future IAPSO conferences or workshops).

6. Italian experts with important roles within the Union or within related Commissions and Programs (if known)

The Italian community is represented in the committees and the commissions of the Association, and has had representative roles within international organizations on behalf of the Association and the Union. In particular, between 1995 and today:

- Paola Malanotte Rizzoli (USA/Italy) was part of the IAPSO Bureau from 1995 to 2007 as President (1999-2003), Past President (2003-2007) and Deputy Secretary General (1995- 1999).
- Mario Astraldi has been member of the Executive Committee from 1995 to 2003.
- Stefania Sparnocchia has been member of the Executive Committee from 2007 to 2015 and Secretary General from 2015 to 2023. Furthermore, she has been Liaison Officer of IUGG/IAPSO for the Intergovernmental Oceanographic Commission of UNESCO from 2011 to 2019 and has been member of the Site Comparison Committee that evaluated the proposals for the IUGG G.A.
- Stefano Tinti is member of the Joint Tsunami Commission (IAPSO/ IASPEI/IAVCEI)
- Christian Ferrarin is member of the Commission on Mean Sea Level and Tides (the commission's members are all those that participate to the commission's meetings, C. Ferrarin has participated to the 2019 meeting)
- Giorgio Budillon (Univ. Parthenope) and Paola Rivaro (Univ. Of Genoa) are the national representatives for SOOS (Southern Ocean Observing System, <https://www.soos.aq/community/national-representatives>)
- Giorgio Budillon is the Italian representative for Physical Sciences in SCAR (Scientific Committee on Antarctic Research, <https://www.scar.org/ssg-ps/ps-members/>).

7. If Union with CNR Commission, short summary about the 2023 CNR Commission activities

This section provides an overview of the activities undertaken by the CNR IUGG Commission in 2023. The Chair of the commission is Fausto Guzzetti and the Scientific Secretary is Warner Marzocchi for the 2023-2026 term. The Commission actively engaged with the proposed IUGG resolution on Geodetic Observatory Protection seeking improved regulations on radio frequencies that could interfere with Very Long Baseline Interferometry (VLBI) operations. This vital technology is crucial for maintaining accurate Earth reference frames used in various scientific and practical applications like GPS/GNSS and radio astronomy. During 2023 the Commission discussed plans for the upcoming 28th IUGG General Assembly in Berlin (July 11-20, 2023). This included potential informal meetings among Commission members and participation in relevant Association events. The Commission noted the presence of several Italian representatives from various Associations (IAG, IAGA, IAHS, IAMAS, IAPSO, IASPEI) at the General Assembly, highlighting broad Italian participation in IUGG activities.

8. Conclusions

2023 demonstrated the valuable role IAPSO plays in propelling Italian oceanographic research forward. From fostering collaboration through BPSGs and the ECSWG to facilitating international exchange at the IUGG General Assembly, IAPSO provides a critical platform for Italian scientists. Moving forward, targeted communication campaigns and strategic investments can ensure Italian researchers maximize the benefits of IAPSO membership. As mentioned on previous occasions, encouraging young researcher participation in IAPSO General Assemblies remains crucial. Supporting these rising stars with scholarships and prizes can significantly enhance their international mobility and foster a new generation of oceanographic leaders for Italy.

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