

IAPSO-IUGG

Activities' Report - Year 2022

Katrin Schroeder and Andrea Cucco

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>).

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.

2. Main activities carried on by IAPSO during 2022 relevant for Italy and for CNR

In 2022, activity has returned to pre COVID levels, although a greater amount of remote activity is now common.

In 2022, several workshops were organised by CNR to present and deepen the main results obtained in the framework of different INTERREG projects (e.g. STREAM, SHAREMED), allowing part of the Italian oceanographic community to share their own experiences and activities in the field of ocean modelling.

In the framework of the cross-border Interreg ITA-HR projects AdriaClim and STREAM, CNR organised the "Ocean modelling workshop and info day" in Venice in September 2022. The main objective of the event was to bring together leading international experts from universities, research centres and public institutions to discuss the state of the art, knowledge gaps and perspectives of ocean modelling activities in the Adriatic Sea. The event was divided into four thematic sessions covering 1) coastal downscaling, 2) river-sea interactions, 3) data/model integration and 4) use and dissemination of ocean model products.

In November 2022, the workshop entitled "The importance of scales and uncertainties in ocean transport: physical and biogeochemical interactions in the Mediterranean Sea" was held in Florence to summarise and deepen the experience and main activities of the MonGOOS community in the field of oceanography. Many CNR researchers associated with IAPSO participated in the event, as CNR was also the hosting institution of the event.

In December 2022, a workshop on ocean modelling was held in Rome with the participation of scientists from the main CNR oceanographic institutes to take stock of the main activities in the field of operational oceanography and numerical modelling.

The HORIZON 2020 funded research project STORM quantified the role of sea level rise predicted by future climate scenarios on composite (sea and river induced) coastal flooding for several locations in the Western Mediterranean Sea and Northern Europe. In particular, high-resolution 2D numerical models were implemented in the coastal areas of the northwestern Mediterranean to reproduce the time-dependent evolution of sea surface height associated with intense storm surge events and for specific sea level rise scenarios. In this preliminary phase, the numerical model results were compared with experimental data sets and the accuracy of the prediction was assessed.

In the framework of the INTERREG project SICOMARplus, a 3D high-resolution oceanographic model was implemented for the entire western Mediterranean Sea to reproduce the temporal and spatial variability of the main pathways of sea surface transport. The accuracy of the model results was estimated by comparing them with experimental data collected during several oceanographic campaigns in 2022. Surface current data were used to quantify both the potential risk of coastal oil spills and to assess the impact of maritime transport restrictions due to the COVID -19 pandemic on the risk computation.

In July 2022, the Kick off meeting of the UN Decade of Ocean Science for Sustainable Development Programme SciNMeet (The Science We Need for the Mediterranean Sea We Want) was held in Rome. SciNMeet aims to be the Mediterranean region's contribution to the UN Decade of Marine Science for Sustainable Development. The programme has been designed based on the outcome of the regional consultations of the 2020 preparatory phase of the Ocean Decade and builds on relevant initiatives in the region. The SciNMeet programme will address key challenges and knowledge gaps in the Mediterranean and initiate science-based, transformative change for the Mediterranean by strengthening the scientific basis in relation to the impacts on marine ecosystems (and thus goods and services) of the various stressors affecting the Mediterranean, i.e. climate change, marine pollution from air/ land/sea-based sources, overexploitation of marine resources, and extreme events that threaten people and the environment, such as storms and tsunamis, in order to create a sustainable, safe and depolluted Mediterranean Sea "climate system" (the Mediterranean Sea we want). By mobilising the scientific community, policy makers, the private sector and society at large, the programme will address the seven outcomes of the Ocean Decade and contribute to the implementation of the 2030 Agenda by promoting education, awareness and international cooperation.

In November 2022, the Italian national project ITINERIS (Italian Integrated Environmental Research Infrastructures System) kicked off, dedicating an entire work package to the marine domain. It will establish the Italian Hub of Research Infrastructures in the field of environmental sciences for the observation and study of environmental processes in the atmosphere, the marine domain, the terrestrial biosphere and the geosphere, providing access to data and services and helping the country to address current and future environmental challenges. ITINERIS coordinates a network of national nodes from 22 RIs (including those relevant to the ocean: ACTRIS, EMSO, Euro-Argo, ICOS, LIFEWATCH, DANUBIUS, e-LTER, Eurofleets, JERICO and SIOS). The main objective is to develop cross-disciplinary research in environmental sciences by using and re-use of existing (or pre-operational) data and services, as well as new observations, to address scientifically and socially relevant issues such as the sustainable use of natural resources, the implementation of nature-based solutions, a green and blue economy, the reduction of pollution, the management and restoration of critical areas and ecosystems, the carbon cycle and the mitigation of the downstream effects of climate and environmental change. This broad vision of environmental research, supported by the main Italian environmental scientists involved in European RIs, is truly innovative and will help our country to take a leading role in European environmental research and shape the framework for the next decade. An important event in 2022, significant for Italian oceanography, was the donation of the Schmidt Ocean Institute research vessel to CNR, now called R/V Gaia Blu. It is expected to be fully operational for the Italian oceanographic community by 2024. The ship is 82.9 metres long and enables marine research not only in the Mediterranean but also in the Atlantic and Pacific as well as in the polar regions.

3. Activities carried on by Italian Delegate within the Union during 2022 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. IAPSO news and calls were disseminated through this national IAPSO mailing list (lista.iapso.it@cnr.it). These included

- call for proposals for the International Year of Basic Sciences for Sustainable Development (IYBSSD2022, deadline 31 July 2022)
- call for nominations for the IUGG Awards 2023 (Fellowships, deadline: 20 September 2022; Gold Medal, deadline: 20 October 2022)
- call for nominations for the IAPSO Early Career Scientist Medals 2023 (deadline 10 January 2023)

- Announcement of the 2023 IUGG General Assembly and deadlines for submission of abstracts to maximise Italian contributions to IAPSO meetings (12 contributions in total).

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

Like the other IUGG associations, IAPSO is a scientific reference and fundamental to the internationalisation of the Italian community, promoting openness to the global community. Through IAPSO, the Italian scientific community has the opportunity to participate in scientific initiatives (conferences, schools, working groups, drafting of strategic plans), also from an organisational point of view. This increases the visibility of the national community and its authority within the federation. The cost of membership in IUGG also has advantages from an economic point of view, as Italian participants are entitled to support for their participation in scientific activities through travel grants and funding for the organisation of workshops in Italy, thanks to the IUGG funding programmes for scientific meetings.

Although several events have been similarly funded in the past, this did not happen during the reporting period. It is hoped that more Italian researchers will participate in such calls in the future, which will be publicised via the mailing list mentioned above.

In summary, the benefit/cost ratio of membership is extremely favourable.

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

The organisation of a national scientific event linked to IAPSO or more generally to IUGG and its associations would help to promote the activities of the Association in Italy and would provide useful content for the preparation of the biennial report on Italian activities. It would also create greater awareness within the national scientific community of the role that Italy could play at the international level, based on its remarkable scientific expertise and the availability of instruments and observational networks. This event could also be organised as a scientific workshop with an IUGG grant (application to be made in the next call for proposals).

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 since 2015 she is Secretary General. 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. in 2023, and selected Berlin.
- 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/>)
- Katrin Schroeder has been appointed as Chair of the Early Career Scientists Award Committee with the role of evaluating the applications received for the awards that will be assigned in 2023 at the IUGG GA in Berlin.

7. Conclusions

As mentioned on previous occasions, it would be useful to establish a national prize for young Italian scientists working on IAPSO topics to encourage their participation in the General Assemblies of the Association. This

participation should also be encouraged by supporting young Italian researchers with scholarships and prizes to increase their international mobility.



Report prepared by Katrin Schroeder, CNR-ISMAR
National Delegate for 2023-2026
for the CNR Ufficio Relazioni Europee e Internazionali
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