

International Association of Geodesy (IAG)
within
International Union of Geodesy and Geophysics (IUGG)

Activities Report - Year 2020

Mattia Crespi, Paolo Messina

1. Introduction

The Commission for the participation of the CNR in the International Union of Geodesy and Geophysics (IUGG) was restarted (decree of CNR President) on February 29, 2016 and I was nominated representative for the CNR within the IAG Council on May 23, 2016, and member of the above mentioned Commission on May 27, 2016.

Paolo Messina (Part Director CNR-IGAG) was nominated substitute representative for CNR, and substitute national representative within the IAG Council.

2. Main activities carried on by IAG during 2020 relevant for Italy and for CNR

In 2020 the quadrennial term 2020-2023 was started, all IAG commissions and study groups were newly constituted and the new *Geodesist Handbook* was published, illustrating the IAG structure and the roles of the involved researchers (see point 6).

The main IAG activities concerned:

- the start of the organization of the IAG Scientific Assembly 2021, which will take place in Beijing (entirely online) from 28 June to 2 July 2021
- the research and service activities of the IGeS at the Politecnico di Milano
- the research and service activities of the Matera Space Geodesy Center
- INGV research and service activities in the geodetic field
- the gravimetric activities of INRIM and the University of Trieste
- the high-rate GNSS activities of Sapienza University of Rome
- the participation of INGV, Politecnico di Torino and Sapienza University of Rome in the *Task Force on Raw Data Measurements* promoted and coordinated by the GSA (European GNSS Agency)
- the contribution of universities and national research centers to the maintenance of national (under the coordination of the Military Geographical Institute), European and international reference frames through their permanent GNSS stations.

3. Activities carried on as Italian Delegate within the Union during 2020 and impact on the Italian scientific community

The activities were dedicated to the organization of the following events at international level, aimed at promoting the participation of the Italian geodetic community (in particular PhD candidates, Post-Docs fellows and young researchers/assistant professors) in the international scientific debate on the main research topics in Geodesy and on the interaction between Geodesy and Geosciences:

- • session High-precision GNSS: methods, open problems and Geoscience applications at the European Geoscience Union 2020 General Assembly (April 2020)
- • session dedicated to the IAG Inter-Commission Committees, including the Inter-Commission Committee on Theory (ICCT) at the IAG Scientific Assembly 2021.

4. Evaluation of the participation of CNR to IAG and IUGG in terms of benefits and membership cost

It has been recognized at international level the more and more increasing importance of geodetic methods and measurements for research and applications in Geosciences, Climatology and Meteorology, Engineering and natural hazards prediction, mitigation and management.

In this respect, it is of particular relevance the recognition of the fundamental role of IAG by the UN-GGIM (United Nations - Global Geospatial Information Management).

It has to be underlined the institution (in 2019) of the Inter-Commission Committee on *Geodesy for Climate Research* and the general topic of the IAG Scientific Assembly 2021, *Geodesy for a Sustainable Earth*.

It is therefore of primary importance to continue the participation within the Union, possibly stimulating a wider participation of PhD candidates, Post-Doc fellows and young researchers also promoting with a dedicated award (may be a 2-years award to support the participation of one/two researcher(s) to the IAG intermediate symposia and IUGG General Assemblies).

5. Evaluation of Italians' attendance to IAG and IUGG events and actions to improve interest and involvement

Italians' attendance to IAG events at international and national level is limited to less than twenty Colleagues (around 15 IAG participants at the 27th IUGG General Assembly held in Montreal in July 2019), mainly since the Italian research activities in Geodesy are developed at few Universities and Institutes (Politecnico di Milano, Sapienza University of Rome, University of Bologna, University of Padua, University of Trento, University of Trieste; Agenzia Spaziale Italiana, Istituto Nazionale di Geofisica e Vulcanologia, CNR-Istituto per il Rilevamento Elettromagnetico dell'Ambiente, Istituto Nazionale di Ricerca Metrologica).

A possible initiative to widen the Italian participation could be the promotion of an Italian Committee for Geodesy under the coordination of CNR Commission for IUGG, with two main aims: 1) to facilitate and coordinate the research activities of the Italian research groups working in Geodesy on the present internationally recognized hot topics (both from the methodological point of view and for application of geodetic methodologies and techniques in Geosciences, Engineering and natural hazards prediction), and 2) to empower the impact of Geodesy on the national community.

6. Italian experts with important roles within the IAG or within related Commissions and Programs

- IAG Fellows: Lucilla Alfonsi, Riccardo Barzaghi, Giovanni Battista Benciolini, Giuseppe Bianco, Carla Braitenberg, Mattia Crespi, Anna Nobili, Rosa Pacione, Mirko Reguzzoni, Fausto Sacerdote, Fernando Sansò, Susanna Zerbini
- Journal of Geodesy Editor: Mattia Crespi
- IAG Executive Committee - IAG Past President (non-voting member) Fernando Sansò
- Commission 2: Gravity Field - Vice-President: Mirko Reguzzoni; Steering Committee Members - Mirko Reguzzoni, Riccardo Barzaghi (IGFS Representative)
- Commission 3: Earth Rotation and Geodynamics - SC 3.1: Earth Tides and Geodynamics - Chair: Carla Braitenberg; SC 3.2: Volcano Geodesy (joint with IAVCEI) - Vice-Chair: Alessandro Bonforte
- Commission 4: Positioning and Applications - WG 4.1.2: Autonomous Navigation for Systems - Vice-Chair: Giorgio Guglieri; WG 4.1.4: Vision Aided Positioning and Navigation - Chair: Andrea Masiero

- Inter-Commission Committee on Theory (ICCT) - Vice-President: Mattia Crespi; JSG T.32: High-rate GNSS - Chair: Mattia Crespi; JSG T.37: Theory and methods related to high-resolution digital topographic and bathymetric models - Chair: D. Carrion
- Inter-Commission Committee on Geodesy for Climate Research (ICCC) - JWG C.2: Quality control methods for climate applications of geodetic tropospheric parameters - Chair: Rosa Pacione
- International Service for the Geoid (ISG) - President: Mirko Reguzzoni, Director: Daniela Carrion
- International Gravity Field Service (IGFS) - Chair: Riccardo Barzaghi
- EUREF Governing Board - Members: Rosa Pacione, Alessandro Caporali
- Global Geodetic Observing System (GGOS) - Coordinating Board Member: Riccardo Barzaghi (IGFS Representative); Science Panel Member: Mattia Crespi; GGOS Bureau of Networks and Observations Member: Riccardo Barzaghi (IGFS Representative); GGOS Bureau of Products and Standards: Riccardo Barzaghi (IGFS Representative); Focus Area Joint Working Group 0.1.3: Implementation of the International Height Reference Frame (IHRF) - Vice-chair: Riccardo Barzaghi.

7. Sshort summary about the 2020 CNR Commission activities

There is no CNR Commission for IAG.

It is considered of high relevance to foresee the institution of an Italian section of the IAG, similarly to other scientific international association.

8. Conclusions

On the basis of the above information, it is clear the need to stimulate a wider participation of the geodetic Italian community to the IAG international events, with particular focus on PhD candidates, Post-Doc fellows and young researchers.

To this aim, two actions are proposed again:

- the promotion of an Italian Committee for Geodesy under the coordination of CNR Commission for IUGG
- the promotion of a dedicated award to support the participation of one/two researcher(s) to the IAG Intermediate Symposia and IUGG General Assembly.

Mattia Crespi

Italian Delegate in IAG-IUGG

Paolo Messina

Italian Alternate Delegate in IAG-IUGG

Rome, April 28, 2021