

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

**Activities Report - Year 2018**

**Mattia Crespi**

**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.

**2. Main activities carried on by IAG during 2018 relevant for Italy and for CNR**

These activities are mainly related to the following official roles within IAG (see below, item 6.), ongoing relevant projects and organization of events at international level:

Official Roles within IAG

Agenzia Spaziale Italiana (ASI) (Giuseppe Bianco) - Chair of the European Laser (EUROLAS) network, Member of the Governing Board of the International Laser Ranging Service (ILRS)

Agenzia Spaziale Italiana (ASI) (Vincenza Luceri) - Representative ILRS within the Commission 1 Steering Committee

Agenzia Spaziale Italiana (ASI) (Rosa Pacione) - Chair of the JWG 4.3.8 (GNSS tropospheric products for Climate)

Politecnico di Milano (Riccardo Barzaghi) - President of the International Gravity Field Service, Member of the IAG and Global Geodetic Observing System (GGOS) Executive Committees, Representative IGFS within the Commission 2 Steering Committee

Politecnico di Milano (Mirko Reguzzoni, Daniela Carrion) - President and Director of the International Service for the Geoid (ISG)

Politecnico di Milano (Mirko Reguzzoni) - Chair of the WG 2.2.1 (Integration and validation of local geoid estimates)

University of Rome "La Sapienza" (Mattia Crespi) - Vice-Presidency of the Inter Commission Committee on Theory (ICCT) of the IAG, Chair of the Joint Study Group (JSG) on *High-rate GNSS* of the ICCT, Representative of ICCT of the IAG within the GGOS Science Panel, Member of GNSS Augmentation to the Tsunami Early Warning System (GATEW) Group

University of Trieste (Carla Braitenberg) - Chair of the WG 2.6.11 (Potential field modelling with petrophysical support)

Projects

Agenzia Spaziale Italiana (ASI) - Satellite Laser Ranging (SLR) data analysis within ILRS activities; Very Long Baseline Interferometry (VLBI) data analysis within IVS activities; Global Navigation Satellite Systems (GNSS) data analysis within EUREF/IERS/IGS activities

Agenzia Spaziale Italiana (ASI) - Politecnico di Milano - Planning, design and realization of the new National GNSS Permanent Network for the realization and maintenance of the Italian Reference Frame within ITRF2014 and ETRF2000 (ongoing)

Agenzia Spaziale Italiana (ASI) - Istituto Nazionale di Geofisica e Vulcanologia (INGV) - CNR- Istituto Nazionale di Ricerca Metrologica (CNR-INRIM) - Regional comparison of absolute gravimeters - EURAMET.M.G-K2 Key Comparison  
 Istituto Nazionale di Geofisica e Vulcanologia (INGV) - RING GPS network maintenance and processing; dense (1000+ GNSS permanent stations) velocity field for Italy estimation  
 Politecnico di Milano - Global gravity field estimation using satellite data (GOCE); projects of the ISG (Integration and validation of local geoid estimates, GEOMED-2 project) - <http://www.isgeoid.polimi.it/Projects/projects.html>; MOCASS (Mass Observation with Cold Atom Sensors from Space)  
 University of Bologna - Coordination of the Geodetic activities within the H2020 project *Beyond Epica – Oldest Ice* within the National Plan for Research in Antarctica  
 University of Padua - Contribution to EUREF and Rete Dinamica Nazionale (RDN) of IGMI (Istituto Geografico Militare Italiano)  
 University of Rome “La Sapienza” - Research activities related to: 1) JSG on *High-rate GNSS* of the ICCT and to GATEW Group; 2) the contribution of coordinate time series to improve the spatial estimation of seismic hazard; 3) participation to the GSA (European Global Navigation Satellite Systems Agency) Task Force for the exploitation of GNSS measurements acquired and made available by Android systems (<https://www.gsa.europa.eu/gnss-applications/gnss-raw-measurements/gnss-raw-measurements-task-force>)  
 University of Trieste - Earth tectonic gravity changes observed with present and future satellites (GRACE, GOCE)

#### Events

Organization of the *IX Hotine-Marussi Symposium* at the Faculty of Civil and Industrial Engineering of the University of Rome La Sapienza and at the Accademia Nazionale dei Lincei (June 18-22, 2018); this Symposium is the main (generally four-yearly) worldwide event on geodetic methodology and theory organized by the ICCT of the IAG, and for the third consecutive time has been organized in Rome, in the same location. The Symposium was attended by 118 scientists (more than expected) coming from all over the world; main features: 10 ordinary sessions with 82 oral and 37 poster presentations, 2 special sessions at the Accademia Nazionale dei Lincei with 6 invited talks, proceedings in a coming volume of the International Association of Geodesy Symposia Series published by Springer. More detailed information and presentations can be found at: <https://sites.google.com/uniroma1.it/hotinemarussi2018/>

### **3. Activities carried on as Italian Delegate within the Union during 2018 and impact on the Italian scientific community**

These activities are mainly related to the above mentioned (see above, item 2.) ongoing relevant projects in charge of the University of Rome “La Sapienza” and to the organization of the following events at international level, to promote the participation of the Italian geodetic Community, with particular attention to PhD candidates, Post-Doc fellows and young researchers, to the international discussion on the hot topics in Geodesy and on the interaction of Geodesy within Geosciences:

#### Events

Organization of the *IX Hotine-Marussi Symposium* at the Faculty of Civil and Industrial Engineering of the University of Rome La Sapienza and at the Accademia Nazionale dei Lincei (June 18-22, 2018).  
 Co-organization (co-convenor) of the *High-precision GNSS: methods, open problems and Geoscience applications* session at the European Geoscience Union 2018 General Assembly (April 2018)

### **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 researches 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 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 20 IAG participants at the *IX Hotine-Marussi Symposium* in Rome), mainly since the Italian research activities in Geodesy are developed at few Universities and Institutes (Politecnico di Milano, University of Rome "La Sapienza", 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 the 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**

Giuseppe Bianco - Agenzia Spaziale Italiana (ASI) - Chair of the European Laser (EUROLAS) network, Member of the Governing Board of the International Laser Ranging Service (ILRS)

Vincenza Luceri - Agenzia Spaziale Italiana (ASI) - Representative ILRS within the Commission 1 Steering Committee

Riccardo Barzaghi - Politecnico di Milano - Chair of the International Gravity Field Service, Member of the IAG and Global Geodetic Observing System (GGOS) Executive Committees

Mirko Reguzzoni, Daniela Carrion - Politecnico di Milano - President and Director of the International Service for the Geoid (ISG)

Alessandro Caporali - University of Padua - Member of the EUREF Technical Working Group

Mattia Crespi - University of Rome "La Sapienza" - Vice-President of the Inter Commission Committee on Theory (ICCT) of the IAG, Chair of the Joint Study Group (JSG) on *High-rate GNSS* of the ICCT, Representative of ICCT of the IAG within the GGOS Science Panel, Member of GNSS Augmentation to the Tsunami Early Warning System (GATEW) Group

Rosa Pacione - Agenzia Spaziale Italiana (ASI) - Member of the European Permanent Network (EPN) Coordination Group (Troposphere Coordinator)

## **7. If Association with CNR Commission, short summary about the 2018 CNR Commission activities**

There is no CNR Commission for IAG.

## **8. Notes (if any)**

No additional notes



## 9. 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

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