



Union Radio-Scientifique Internationale (URSI)

Activity Report - Year 2018

Prof. Roberto Sorrentino

1. Introduction

The URSI (www.ursi.org) mission statement is as follows: “Radio science encompasses the knowledge and study of all aspects of electromagnetic fields and waves. The International Union of Radio Science (Union Radio-Scientifique Internationale), a non-governmental and non-profit organization under the International Council for Science, is responsible for stimulating and coordinating, on an international basis, studies, research, applications, scientific exchange, and communication in the fields of radio science.” Included within the objectives are the following:

- To encourage and promote international activity in radio science and its applications, for the benefit of humanity;
- To encourage the adoption of common methods of measurement, and the intercomparison and standardization of the measuring instruments used in scientific work;
- To stimulate and co-ordinate studies of:
 - o the scientific aspects of telecommunications using electromagnetic waves, guided and unguided;
 - o the generation, emission, radiation, propagation, reception, and detection of fields and waves, and the processing of the signals embedded in them.
- To represent radio science to the general public, and to public and private organizations.

The first General Assembly of URSI was held in July 1922 in Brussels. At that time, only four National Committees had been formed officially: Belgium, France, United Kingdom and the USA. However, the following new Committees adhered to the Union during the same year: Australia, Spain, Italy, Japan and the Netherlands. The Italian URSI Committee operates under the umbrella of the National Research Council (CNR) which pays the fee for Italian participation in URSI.

The range of scientific activities covered by URSI is reflected by the scope of its scientific commissions, namely

- Commission A: Electromagnetic Metrology
- Commission B: Fields and waves
- Commission C: Radiocommunication systems and signal processing
- Commission D: Electronics and photonics
- Commission E: Electromagnetic environment and interference
- Commission F: Wave propagation and remote sensing
- Commission G: Ionospheric radio and propagation
- Commission H: Waves in plasmas
- Commission J: Radio astronomy
- Commission K: Electromagnetics in biology and medicine

The CNR-URSI Committee has ten mirror commissions fully reflecting the scopes of the international URSI scientific commissions. Officers and their substitutes of the CNR-URSI scientific commissions can be found [here](#).

URSI organizes three flagship international conferences where all the scientific commissions are involved:

- The “General Assembly of the International Union of Radio Science” (URSI GASS)
- The “Atlantic Meeting on Radio Science” (URSI AT-RASC)
- The “Asia-Pacific Radio Science Conference” (URSI AP-RASC)

The three flagship conferences take place on a three-year basis (2017 URSI GASS, 2018 URSI AP-RASC, 2019 URSI AT-RASC, 2020 URSI GASS and so on).

2. Main activities carried out by URSI during 2018 relevant for Italy and for CNR

During the URSI GASS 2017 Italy won the selection for the 2020 URSI GASS location. Hence the 2020 URSI GASS conference will take place in Rome (within the premises of “La Sapienza” University from 29 August to 5 September). This implies a large effort for the organization of this important event that it is expected to attract more than 1500 radioscienceists from all over the world. Several meetings between the Local Organizing Committee members, members of the board of URSI and the Scientific Program Chair of the conference Prof. Alain Sibille took place in 2018. Namely, on February 16, at CNR in Rome with URSI Secretary General Prof. Peter Van Daele, during the 2018 AP-RASC conference in Gran Canaria with URSI Board, on the 3rd and 4th of July in “La Sapienza” University and in Hotel Ergife in Rome with several members of the URSI Board and Prof. Alain Sibille and, finally, in Cagliari during the URSI Italy Special Session at RiNEm (National Congress on Electromagnetics) on the 5th of September, again with Prof. Alain Sibille.

3. Activities carried out by Prof. Sorrentino within URSI during 2017 and the impact on the Italian scientific community

Prof. Sorrentino has successfully supported the candidacy of Italy for hosting the 2020 URSI GASS, with the cooperation of Prof. Guglielmo D’Inzeo (General Chair of URSI GASS 2020). Further, Prof. Sorrentino is also active in establishing relationships between the CNR-URSI Committee and other European national URSI Committees for the purpose of reinforcing the European leadership within URSI in view of the 2020 URSI GASS conference. This commitment is reflected by participation of the following European speakers at the URSI Italy Special Session held in Cagliari: Prof. Alain Sibille (LTCI, Telecom ParisTech), Prof. Ludger Klinkenbusch (Kiel University) and Prof. Gabriele Gradoni (University of Nottingham). A large effort has been undertaken by Prof. Sorrentino, Prof. d’Inzeo and Prof. Manara in order to formalize the Memorandum of Understanding between URSI and Società Italiana di Elettromagnetismo (SiEm) for the organization of URSI GASS 2020 and the contract between SiEm and the Professional Conference Organizer AIM that provides support to all the non-scientific aspects of the organization of the conference.

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

Participation in URSI has, up to now, permitted to provide visibility to Italian radioscienceists. The organization of the 2020 URSI GASS conference in Rome is a great opportunity to strengthen existing international relationships as well as to establish new ones. Several Individual Membership applications to URSI were submitted by Italian radioscienceists that participated in AT-RASC 2018 in Gran Canaria and much more are expected in 2019 in view of URSI GASS 2020. Several Italian radioscienceists are expected to be charged with important roles in URSI (e.g. scientific commission chair and vice-chair) during URSI GASS 2020 in Rome.

5. Evaluation of Italian attendance and how to improve interest and involvement

The 2018 URSI AT-RASC conference in Gran Canaria was attended by a relatively large number of Italian radioscienceists. More than 30 Italian delegates participated in the meeting organized by Prof. Sorrentino and Prof. Carobbi (Secretary of the CNR-URSI committee) in order to inform about the activities of the CNR-URSI committee. Italy was, after US, the country that most contributed to the conference in terms of the number of accepted scientific contributions (papers). Therefore, the participation of Italian radioscienceists in international events is strong but, at the same time, we have to note that Italian radioscienceists do not reach a proportional number of apical positions within URSI. The involvement of young Italian radioscienceists should also be increased. Actions have been undertaken to promote URSI in Italy through information about the advantages deriving from individual membership. A Young Scientists (YS) competition is also in preparation for the next URSI Italy Special Session that will be held in Pisa on September 2019 during the IEEE RFID-TA conference.

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

In the triennium from 2017 to 2020, Italy has no international Commission Chairs, but has:

- Commission G Vice Chair: Giorgia De Franceschi (INGV)
- Commission B Early Career Representative (ECR): Andrea Michel (University of Pisa)
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7. Short summary of the 2017 CNR Commission activities

The CNR-URSI Committee met on February 22, May 21, September 5 and October 29. The minutes of these meetings are available on the website of the CNR-URSI commission <http://www.ursi.cnr.it>. Also in 2017 the CNR-URSI Committee organized a special session within an international event. As mentioned above the 2017 URSI Italy Special Session took place during the RiNEm in Cagliari on the 5th of September. During the special session the following lectures were given:

- Mauro Messerotti (INAF-Astronomical Observatory of Trieste, “Solar Radio Interferences on Radio Systems: A Direct Space Weather Effect”)
- Alain Sibille (LTCI, Telecom ParisTech, “Statistical methods for joint antenna-radio channel modelling”)
- Ludger Klinkenbusch (Kiel University, “Scattering and Diffraction of Complex-Source Beams by Canonical Objects”)
- Gabriele Gradoni (University of Nottingham, “Wave Chaos for Electromagnetic Environment Modelling and Control”)

The presentations are available through the CNR-URSI Committee website (<http://www.ursi.cnr.it/News.html>).

8. Notes (if any)

Nothing to note.

9. Conclusions

The CNR-URSI Committee is active in promoting scientific activities within URSI. A great achievement and opportunity obtained in 2017 is the responsibility for the organization of the next 2020 URSI GASS conference in Rome. More than 1500 participants are expected. The CNR-URSI Committee has to strengthen international relationships with other national URSI committees, in particular European committees. This is important for the success of the 2020 URSI GASS conference and for improving visibility of Italian radioscience. Networking is also essential in order to increase the number of apical positions within URS held by Italian radioscience.

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Prof. Roberto Sorrentino



(in cooperation with Prof. Carlo Carobbi)