



Union Radio-Scientifique Internationale (URSI)

Activities' Report – Year 2023

Prof. Carlo Carobbi

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 and Scientific Symposium of the International Union of Radio Science” (URSI GASS)
- The “Atlantic Radio Science Conference” (URSI AT-RASC)
- The “Asia-Pacific Radio Science Conference” (URSI AP-RASC)

The three flagship conferences take place on a three-year basis.

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

In 2023 URSI organized the URSI General Assembly and Scientific Symposium (GASS) 2023 in Sapporo, Japan (August 19-26). The triennial URSI GASS Conference is the most attended of the URSI flagship conferences. The number of registrants at URSI GASS 2023 was 1417. The top five countries with the highest number of registrants were Japan (437 registrants), China (212), USA (190), Italy (63), India (47). In terms of submissions: the total number was 1682 and the top five contributing countries were Japan (394 submissions), USA (257), China (186), India (111) and Italy (99). It is therefore confirmed that the Italian radio scientists are among the most active in Europe. It is also important to mention that several Italian delegates have leading roles in URSI scientific commissions, then they have a prominent role in the preparation of the scientific program of the URSI flagship conferences (including URSI GASS 2023) during the triennium of their leadership.

As in the past URSI flagship conferences, a meeting of the Italian delegates attending URSI GASS 2023 was organized, for the purpose of informing delegates about the activities of URSI in Italy (in particular, the annual meeting and the “Sorrentino” award for young scientists) and for presenting the CNR-URSI Committee, its history and structure. In Fig. 1 it is shown a nice picture of a group of Italian delegates in Sapporo.



Figure 1: A group of Italian delegates attending URSI GASS 2023 in Sapporo (Japan).

The URSI Electromagnetic Theory Symposium 2023 (URSI EMTS 2023) was held in Vancouver (Canada), May 23-26, 2023. The conference belongs to the specific symposium series organized every three years by URSI Commission B. During the business meetings of Commission B in Vancouver, a bid for holding the next EMTS 2025 in Bologna (Italy) was presented. This proposal was later-on approved with an on-line votation extended to all Commission B national representatives. The URSI EMTS 2023 will be then organized with the support of the CNR-URSI Committee at the Alma Mater University of Bologna in June 2025.

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

I have organized, in collaboration with Andrea Michel (past ECR1 of URSI Commission B, University of Pisa) the 1st edition of the URSI School for Young Scientists (YSs) which was given during URSI GASS 2023 on the topic of Electromagnetic Measurements. The URSI School involved four international lecturers and about 100 attendees from all over the world.

I organized, in collaboration with the Secretary of Commissione CNR-URSI, Prof. Giuliano Manara, the meeting of the Italian radio scientists attending URSI GASS 2023 (see previous paragraph).

In collaboration with Prof. Manara, I organized the Annual Meeting of the Italian URSI Committee, which was held in Genova on November 17, 2023, jointly with the 2023 IEEE Conference on Antenna Measurements and Applications. Two tutorial presentations were given:

- Andrea Randazzo and Alessandro Fedeli, Commission B: Fields and waves, Electromagnetic theory and applications, “Microwave imaging techniques and applications (In memory of Matteo Pastorino)”
- Erika Pittella, Commission A: Electromagnetic Metrology, Electromagnetic measurements and standards, “Dielectric characterization of materials at microwave frequencies”

The Annual meeting of the Italian URSI Committee was exceptionally attended by the URSI Secretary General, Prof. Peter Van Daele. Prof. Van Daele presented “The 100 years history and recent activities of the International Union of Radio Science (URSI)”.

During the CNR-URSI annual meeting, the presentations of the three finalists of the “Roberto Sorrentino” award for Young Scientists were also given and the jury selected Dr. Simone Negri as the winner of the 2023 edition. The winner was awarded with a 500 Euro prize granted by URSI Secretariat. All the finalists received a certificate of appreciation.

The Chair of the Italian Chapter of Women in Radio Science (WIRS) Italy, Prof. Micaela Liberti (Sapienza Università di Roma), gave a presentation titled “The URSI Women in Radio Science (WIRS) initiative and the URSI WIRS Italian Chapter”. The WIRS Young Scientists event “Empowering Waves: the Radiant Role of Women in Radio Science”, planned for February 16, 2024, in Rome, Sapienza University, was announced by Prof. Liberti.

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

During URSI GASS 2023 the following Italian radio scientists were elected to URSI apical positions for the triennium 2023-2026:

1. Giuliano Manara, Vice-President URSI
2. Carlo Carobbi, Chair Commission E
3. Francesca Apollonio, Chair Commission K
4. Giovanna Signorile, Early Career Representative 1 Commission A
5. Valentina Palazzi, Early Career Representative 1 Commission D
6. Giacomo Paolini, Early Career Representative 2 Commission D
7. Riccardo Trincherò, Early Career Representative 1 Commission E
8. Dario Sabbagh, Early Career Representative 1 Commission G

In the next triennium (2026-2029), vice-chairs will be promoted to chairs and early career representatives 2 to early career representative 1. Moreover, chairs will be promoted to the grade of URSI fellows.

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

The participation of Italian radio scientists in international events has always been strong but, at the same time, it should be noted that in the past Italian radio-scientists did not reach a proportional number of apical positions within URSI. Thanks to the organization of URSI GASS 2021 in Rome, the involvement of young and senior Italian radio scientists has significantly increased.

Moreover, actions have been undertaken to promote URSI in Italy through information about the advantages deriving from individual membership. In particular, we hope that the recent activation of the mailing list of URSI affiliated and sympathizers under the responsibility of CNR will provide a significant benefit in this respect. The mailing list was already successfully employed to spread information about URSI GASS 2023 in Sapporo (August 19 to 26) and the newborn Italian WIRS Chapter.

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

Please, refer to the list reported in clause 4.

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

The CNR-URSI Committee met on June 27, 2023 online. The minutes of these meetings are available on the website of the CNR-URSI Committee <http://www.ursi.cnr.it>. The annual 2023 meeting of the CNR-URSI Committee was held in Genova, jointly with the international conference IEEE CAMA 2023. See section 3 of this report for details.

8. Conclusions

The CNR-URSI Committee is one of the most active URSI Member Committees in promoting scientific activities within URSI, both at international and national levels. A great achievement and opportunity, obtained in 2017, was the responsibility for the organization of the 2021 URSI GASS conference in Rome. The CNR-URSI Committee successfully carried out this task, thus significantly improving the visibility of Italian radioscientists. The main regret is that the economic benefits that derived from this massive effort are not in the availability of the CNR-URSI committee because, due to its structure, the committee could not take over any financial responsibility (and relevant risks) in the organization of URSI GASS 2021. All the benefits were shared among the following organizations: Società Italiana di Elettromagnetismo (SIEm) and the professional conference organizer AIM International. The same applies for future events organized under the responsibility of the CNR-URSI committee. This state of affairs should be changed because it discourages the CNR-URSI Committee from undertaking similar efforts in the future and leaves few margins to increase the involvement of the Italian scientific community to URSI.

Firenze, 10th May 2024

Prof. Carlo Carobbi

(in cooperation with Prof. Giuliano Manara)