



Union Radio-Scientifique Internationale (URSI)

Activity Report – Year 2021

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 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 (2017 URSI GASS, 2018 URSI AP-RASC, 2019 URSI AT-RASC, 2020 URSI GASS and so on).

2. Main activities carried on by URSI during 2021 relevant for Italy and for CNR

During the URSI GASS 2017 Italy won the selection for the 2020 URSI GASS location. The conference was postponed to 2021 due to COVID 19 pandemic. The International URSI Board decided to only organize the URSI GASS 2020 Student Paper Competition, which was held virtually. The 2021 URSI GASS conference took place in Rome, within the premises of the faculty of engineering of “La Sapienza” University from 28 August to 4 September 2021. A large effort for the organization of this important event was undertaken in 2019, 2020 and, finally, in 2021.

About 1700 scientific contributions were submitted and more than 1100 radioscientists registered to the conference for virtual or on-site attendance (URSI GASS 2021 had a hybrid format). The following tables report precise figures about registrations and their distribution over category and type of registration.

Table 1. Early bird registrations.

EARLY BIRD	
Category	Numbers
Members	446
Non-Members	185
Students	211
Students (2 papers)	15
Students (3 papers)	4
TOTAL FULL REGISTRATIONS	631
STUDENT REGISTRATIONS	230
Virtual Conference Viewers	5
Accompanying persons	4

Table 2. Mid-term registrations.

MID TERM	
Category	Numbers
Members	46
Non-Members	20
Students	12
Students (2 papers)	2
Students (3 papers)	0
TOTAL FULL REGISTRATIONS	66
STUDENT REGISTRATIONS	14
Virtual Conference Viewers	6
Accompanying persons	1

Table 3. Late registrations.

LATE	
Category	Numbers
Members	30
Non-Members	8
Students	4
Students (2 papers)	0
Students (3 papers)	0
TOTAL FULL REGISTRATIONS	38
STUDENT REGISTRATIONS	4
Virtual Conference Viewers	12
Pre-Conference Viewers	1
Accompanying persons	1

Table 4. All registrations with fees.

TOTAL NUMBER OF REGISTRATIONS WITH FEES	
Category	Numbers
Members	522
Non-Members	213
Students	227
Students (2 papers)	17
Students (3 papers)	4
TOTAL FULL REGISTRATIONS	735
STUDENT REGISTRATIONS	248
Virtual Conference Viewers	23
Accompanying persons	6

Table 5. Free registrations (URSI officials and other categories).

FREE REGISTRATIONS	
Category	Numbers
URSI Officials	35
Young Scientist Awardees	95
URSI Guests	29
LOC Guests	30
Sponsors	3
TOTAL FULL REGISTRATIONS	97
STUDENT REGISTRATIONS	95

LOC members paid the registration fee as any other participant. About 100 volunteers (master degree students, PhD students and researchers from the universities in Rome) definitely contributed to the success of the conference. Due to the COVID 19 pandemic on-site attendance from some countries was not allowed or extremely difficult due to mandatory quarantine. The distribution of participants over countries and type of participation (on-site or online) is reported in the following tables.

Table 6. On-site participants.

PARTICIPANTS PER COUNTRY – ON-SITE	
Country	Numbers
Italy	145
France	57
USA	45
Germany	14
Poland	12
Other countries	90
TOTAL ON-SITE	363

Table 7. Online participants.

PARTICIPANTS PER COUNTRY – ONLINE	
Country	Numbers
USA	163
Japan	109
Italy	49
China	42
India	42
UK	41
France	40
Germany	36
Other countries	324
TOTAL ONLINE	850

The economic balance of the conference was positive and important revenues were shared among URSI headquarter, Società Italiana di Elettromagnetismo (SIEm) and the professional conference organizer AIM International.

3. Activities carried on by the Italian Delegate Prof. Carlo Carobbi within the Union during 2021 and impact on the Italian scientific community

The activity carried out by the Italian Delegate in 2021 was entirely devoted to the coordination of the LOC of URSI GASS 2021, in collaboration with the general chair Prof. Guglielmo d'Inzeo and vice chair Prof. Giuliano Manara, and in the provision of the necessary coordination between the LOC and URSI headquarter and the scientific program chair, Prof. Alain Sibille. The Italian Delegate participated also in the URSI Council meetings that took place during URSI GASS 2021 for expressing the Italian position on Council relevant matters and to vote candidates to URSI apical positions, both Italian and non-Italian, for which support was agreed upon within the Italian National Committee.

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

The organization of URSI GASS 2021 in Rome had undoubtedly a positive impact on nominations of Italian radioscientists to URSI apical positions. In particular, the following Italian radioscientists were elected for the biennium 2021-2023:

1. Giuliano Manara, Vice-President URSI
2. Giorgia De Franceschi, Chair Commission G
3. Carlo Carobbi, Vice-Chair Commission E
4. Francesca Apollonio, Vice-Chair Commission K
5. Andrea Michel, Early Career Representative 1 Commission B
6. Giovanna Signorile, Early Career Representative 2 Commission A
7. Valentina Palazzi, Early Career Representative 2 Commission D
8. Riccardo Trincherio, Early Career Representative 2 Commission E
9. Dario Sabbagh, Early Career Representative 2 Commission G

In the next triennium (2023-2026), 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. Instead, it will be possible to nominate the vice-president for the same position or for URSI president.

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

The participation of Italian radioscientists in international events has always been strong but, at the same time, it should be noted that in the past that 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 radioscientists 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 activation of a mailing list of URSI affiliated and sympathizers under the responsibility of CNR will provide a significant benefit in this respect.

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. If Union with CNR Commission, short summary about the 2021 CNR Commission activities

The CNR-URSI Committee met on April 30, and December 17. The minutes of these meetings are available on the website of the CNR-URSI Committee <http://www.ursi.cnr.it>. According to the tradition of the latest years, the CNR-URSI Committee organizes an annual meeting within a larger national or international event. In the year 2021, the CNR-URSI Committee was deeply involved in the organization of URSI GASS 2021 in Rome, at La Sapienza University in Rome. This conference, despite the COVID 19 pandemic, had a great success in terms of on-site and online participation, involvement of Italian radioscientists and their nominations to URSI apical positions.

8. Conclusions

The CNR-URSI Committee is active in promoting scientific activities within URSI. 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 organizations mentioned in clause 2. 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 commission from undertaking similar efforts in the future, and leaves few margins to increase the involvement of the Italian scientific community to URSI.

Firenze, 29th April 2021

Prof. Carlo Carobbi

A handwritten signature in black ink, reading "Carlo Carobbi". The script is cursive and fluid, with the first name and last name clearly distinguishable.

(in cooperation with Prof. Giuliano Manara)