

Commission A: GASS 2023 Report

1. Elections of Commission Officers

The election results of the new Commission Officers were announced on 23 August, 2023, after due ratification by the Council. Dr Jose Mauricio Lopez Romero (Mexico) was elected as the new Vice-Chair and Dr Ricardo Figueiredo (Portugal) was elected as the new (Early Career Representative) ECR for the next triennium 2023-26.

Former Vice-Chair, Dr. Amitava Sen Gupta, took over the position of Commission A Chair until GASS 2026. The new Vice-Chair, Dr José Mauricio López Romero, will work with the new Chair to organize various activities of the Commission A and will become the Chair at GASS 2026.

Two ECRs work with the Chair and the Vice-Chair to ensure that the Commission is attractive to their early-career peers. Dr. Giovanna Signorile will continue her term until GASS 2026. The new ECR, Dr Ricardo Figueiredo will take over the outgoing ECR of Dr. Noshewan Shoaib and continue until GASS 2029.

2. Review of Terms of Reference

The Terms of Reference of the Commission A was reviewed during the 2nd CCA Meeting on 23 August, 2023 and some changes were proposed and agreed. The revised Terms of Reference were then submitted to the Council and were approved for the triennial term of 2023-2026. The new Terms of Reference are as the following.

The commission promotes research and development in the field of measurement standards and physical constants, calibration and measurement methodologies, improved quantification of uncertainty, continued achievement of accuracy and traceability of measurements. Areas of emphasis are:

- development and refinement of new measurement techniques and calibration standards including techniques for antennas;
- primary standards including those based on quantum phenomena and the realization and dissemination of time scales and frequency standards;
- characterization of the electromagnetic properties of materials, physical constants, and the properties of engineered materials, including nanotechnology;
- methodology of space metrology, electromagnetic dosimetry, and measurements for health diagnostics, and biotechnology, including biosensing;
- measurements in advanced communication systems and other applications.

The commission fosters accurate and consistent measurements needed to support research, development, and exploitation of electromagnetic technologies across the spectrum and for all commissions.

3. Working Group

Following the discussions at Business Meeting in GASS2014, a Working Group for Education and Training has been set up. The name and the Terms of Reference of the Working Group were introduced and new members were solicited. Before the GASS2017, the status of the Working Group was ad-hoc, but it was formally established at the GASS2017.

Name of the Working Group

Working Group for Education and Training

Terms of Reference

Electromagnetic metrology attracts students and trained specialists from a wide variety of fields, such as biophysics, electrical engineering, health sciences, materials science, physics, radio science, and statistics. The purpose of this Working Group is to promote the education of both students and actively working professionals by collecting information about available training resources on the techniques and fundamental principles involved in the work of

Commission A, and to promote education in metrology by disseminating the information gathered and making it available on a public web page. At present the relevant information collected by this Working Group is hosted on the website of the Indian Radio Science Society (InRaSS) on the page <https://www.inrass.in/ursi-commission-a-working-group-a-1-home-page/>

Members

Chair: Demetrios Matsakis (Masterclock, USA), Vice chair: Steven Weiss (The Johns Hopkins School for Professionals, USA), Members: Ashish Agarwal (National Physical Laboratory, India), Carlo F. M. Carobbi (University of Florence, Italy), William A. Davis (Professor Emeritus, Virginia Tech, USA), Yashiro Koyama (NICT, Japan), Tian Hong Loh (National Physical Laboratory, UK), Razvan D. Tamas (Constanta Maritime University, Romania), Amitava Sen Gupta (The NorthCap University, India), Patrizia Tavella (BIPM, France), Congsi Wang (Key Laboratory of Electronic Equipment Structure, China), , Parameswar Banerjee (Ex. National Physical Laboratory, India)

4. Technical Advisory Committee

The Technical Advisory Committee (TAC) of the Commission A was first created at the time of GASS 2014 (Beijing) following a suggestion by the Board. The mandates for the TAC are to help with comments and advice for the scientific programs for the flagship conferences and for resolutions and recommendations. It has subsequently updated thrice during the GASS 2017 (Montreal) and GASS 2021 (Rome) and the recently concluded GASS 2023 (Sapporo). The present list of members of the TAC for the triennial term of 2023-2026 is as shown.

1. Amitava Sen Gupta, The NorthCap University, India
2. Jose Mauricio Lopez Romero, Cinevestav, Mexico
3. Nuno Borges Carvalho, Instituto de Telecomunicacoes, Universidade de Aveiro, Portugal
4. Yasuhiro Koyama, NICT Japan
5. Pedro Miguel Cruz, Bosch Security Systems SA, Portugal (ECR)
6. Noshawan Shoaib, National University of Sciences and Technology, Pakistan (ECR)
7. Patrizia Tavella, BIPM, France
8. Demetrios Matsakis, Masterclock, USA
9. Tian Hong Loh, National Physical Laboratory, UK
10. Wojciech Skierucha, Instytut Agrofizyki im. Bohdana Dobrzańskiego PAN w Lublinie, Poland
11. Felicitas Arias, Ex BIPM, France
12. Parmeswar Banerjee, Ex Amity University, India
13. Ekkehard Peik, PTB, Germany
14. Rowayda Sadek, Helwan University, Egypt
15. Marina Gertsvolf, NRC, Canada
16. Chen Kunfeng, The 41st Institute of CETC, China
17. Liu Min, Beijing Orient Institute of Metrology and Test, Beijing, China
18. Steven Weiss, The Johns Hopkins School for Professionals, USA
19. Archita Hati, NIST, USA
20. Takehiko Tanabe, NMIJ, Japan
21. Emmanuel Van Lil, KU Leuven, Belgium

22. Alirio de Jesus Soares Boaventura, NIST, USA

23. Dominique Schreurs, KU Leuven, Belgium

5. Preparation of Future Meetings

The following URSI flagship meetings in the coming triennium: AT-RASC during 19–24 May, 2024 in Gran Canaria, Spain; AP-RASC during August 2025 in Sydney, Australia; and GASS during 15–22 August in Krakow, Poland, were briefly discussed in the CCA meetings. The focus right now is to prepare for the scientific program for the AT-RASC 2024 and is discussed in the next section. For the AP-RASC 2025 and GASS 2026, it is too soon to plan and prepare, but the overall topics will be similar to those for the forthcoming AT-RASC 2024.

Members were informed about the provision for limited amount of funding from the Commission A budget for any regional meeting or workshop. At present however, no proposals were available for support by Commission B budget. But we plan to work on this in the coming months.

6. Proposed sessions and conveners for AT-AP-RASC 2022

The following sessions will be organized at AT-RASC 2024. These were decided during GASS 2023 and a few weeks following that.

A01: Antenna and Propagation Measurement Techniques (Conveners: Tian Loh, Nuno Carvalho and Ricardo Figueiredo)

A02: Measurements in Telecommunications and Advanced Communication Systems (Conveners: Tian Loh, Nuno Carvalho and Ricardo Figueiredo)

A03: Metrological Analysis and Characterization of Material Properties (Conveners: Noshewan Shoaib, Imran Shoaib and Takashi Shimizu)

A04: Measurements in Intelligent IoT System: Development and Applications (Conveners: Rowayda Sadek, Poonam Arora and Pedro Miguel Cruz)

A05: Electrical and Electromagnetic Metrology including Quantum Standards (Conveners: Satyakesh Dubey, Thomas Kleine-Ostmann, You Li and Diego Luna)

A06: Metrology of Electromagnetic Sensors (Conveners: Nuno Carvalho, Carlos Ortiz and Pedro Miguel Cruz)

A07: Applied Metrology in diverse areas including Medical diagnostics, Bio-sensing, Agriculture, Smart Cities etc. (Conveners: Nuno Carvalho, Wojciech Skierucha and Rowayda Sadek)

A08: Space Metrology (Conveners: Liu Min and Wang Qianjuan)

A09: Calibration, Traceability, and Inter Comparisons of Instruments and Measurements (Conveners: Joseph Achkar, Carlo Carobbi, Raul Solis and Demetrios Matsakis)

A10: Microwave and Optical Frequency Standards (Conveners: Michael Kazda, Tekehiko Tanabe, Poonam Arora and Amitava Sen Gupta)

A11: Realization and Dissemination of Time Scales and Standard Frequencies (Conveners: Jose Mauricio Lopez, Dirk Piester, Demetrios Matsakis and Ashish Agarwal)

A12: Time and Frequency Metrology, Phase Noise and Frequency Synthesis (Conveners: Archita Hati, Michael Kazda and Amitava Sen Gupta)

A13: Time & Frequency Transfer Techniques and Precision Geolocation (Conveners: Dirk Piester, Joseph Achkar, Giovanna Signorile and Parameswar Banerjee)

A14: Low-Cost GNSS Modules for Timing Applications (Conveners: Dinesh Manandhar, Anindya Bose and Amitava Sen Gupta)

A15: Precision Metrology – Training, Management, and Prospects (Conveners: Demetrios Matsakis, Steven Weiss, Parameswar Banerjee)

KA01: Methods and novel technologies for absorbed/epithelial power density assessment above 6 GHz (Conveners: Maxim Zhadobov, Paulraj Rajamani and Amitava Sen Gupta)