

*This report was prepared by Professor G. Manara, Commission B Chair 2011-2014.*

## **1. GA 2011, Istanbul (Turkey)**

The URSI Board approved the election of Giuliano Manara, Italy, as Chair, and Ari Sihvola, Finland, as Vice-Chair, for the period 2011 – 2014.

## **2. International Electromagnetic Theory Symposium 2013 (EMTS 2013)**

The “2013 URSI Commission B, International Symposium on Electromagnetic Theory” (EMTS 2013) was held in Hiroshima, Japan, May 20 - 24, 2013; the symposium attracted about 330 participants. It was organized by URSI Commission B in collaboration with the Electronics Society (ES) of The Institute of Electronics, Information and Communication Engineers (IEICE) of Japan. The Local Organizing Committee was co-chaired by Prof. Tsuneki Yamasaki (Nihon University, Japan) and Prof. Makoto Ando (Tokyo Institute of Technology, Japan).

EMTS 2013 was the 21st event in a triennial series of international symposia with a long history, started in 1953. It was organized in Japan for the first time. The main symposium venue was the International Conference Center of Hiroshima (ICCH), located in the Peace Memorial Park, where Opening Reception, Opening Ceremony, all Technical (oral and poster) Sessions, Technical Exhibitions, and Plenary Talks, as well as Commission B Business Meetings were held. On the third day, the venue was moved to Aki Grand Hotel at Miyajima-guchi, where two Plenary Talks and a poster session with the participation of all Young Scientist Awardees (YSA) were given. After these sessions, participants could enjoy a late afternoon visit to the wonderful Island of Miyajima, where they could enter the Itsukushima Shrine, a world heritage, and watch the big torii gate located in the sea. The visit was followed by the Banquet at the ANA Crowne Plaza Hiroshima Hotel.

As for General Assemblies and Scientific Symposia (GASS), URSI Commission B symposia carefully maintain the tradition to support Young Scientists (YS). The Hiroshima Symposium received 45 applications satisfying the criteria that the applicant must be the first author of a paper presented at the conference, and that her/he must be younger than 35. According to custom, for the Commission B Symposia the current Vice-Chair of the Commission, Prof. Ari Sihvola, was responsible to handle the (YS) program. With the help of reviewers, 24 awardees were selected and, as a matter of fact, due to the financial support of URSI and of the Local Organizing Committee, their registration fee was waived, they received a per diem, an invitation to the Banquet and free accommodation covering the full conference duration. Moreover, those from developing countries also received a financial travel support.

Thanks to the support of the software company CST AG, a Young Scientist Best Paper Award was organized. The awardees were selected in the context of the poster session for YSA, organized at the Aki Grand Hotel. Finally, the awardees were announced during the Banquet: 1) Ariel Epstein, Technion - Israel Institute of Technology, Israel, for the paper “On the Relevance of Two-Dimensional Sources for Modelling Optical Emission from Layered Media;” 2) Francesco Andriulli, Ecole Nationale Supérieure des Telecommunications de Bretagne, France, for the paper “Rapidly Converging Electromagnetic Simulations in the Entire Frequency Spectrum without the Search for Global Loops;” 3) Martin Štumpf, Brno University of Technology, Czech Republic, for the paper “Impulsive Electromagnetic Response of Thin Plasmonic Metal Sheets.”

### **3. URSI Commission B School for Young Scientists**

The decision of organizing URSI Commission B Schools for Young Scientists was taken in the Business Meetings of Commission B during GASS 2011 in Istanbul. The basic idea for the school was to encourage Young Scientists to learn the fundamentals and future directions in the area of electromagnetic theory from related lectures.

The first “URSI Commission B School for Young Scientists” was organized in the framework of EMTS 2013 in Hiroshima, Japan. The School was a one-day event, sponsored jointly by URSI Commission B and the EMTS 2013 Local Organizing Committee. The school offered a short, intensive course, where a series of lectures were delivered by two leading scientists in Commission B community. The general title of the school was: “Fundamentals of Numerical and Asymptotic Methods.” It consisted of a couple of lectures of four hours each, given by Prof. Donald R. Wilton, “The Method of Moments (MoM) Applied to Problems in Electromagnetic Scattering, Radiation, and Guided Waves,” and by Prof. Prabhakar H. Pathak, Dept. of ECE, The Ohio State University ElectroScience Laboratory, USA, “A Summary of Asymptotic High Frequency (HF) Methods for Solving Electromagnetic (EM) Wave Problems.”

The second edition of the school will be organized at the URSI GASS 2014 in Beijing, China. Again, it will be a one-day event (two lectures of four hours each) given by Prof. Nader Engheta, University of Pennsylvania, USA. The title of the school is: “Fields and Waves in Metamaterials.”

### **4. International URSI Commission B Symposia 2016 and 2019**

The 2016 International Symposium on Electromagnetic Theory (EMTS 2016) will be held on August 14–18, 2016, in Espoo, Finland. It will be organized by the Commission B (Fields and Waves) of the International Union of Radio Science (URSI) and Aalto University. A pre-announcement flyer has been distributed during the Hiroshima Electromagnetic Theory Symposium. Questions about the Symposium and its technical program can be directed to the present URSI Commission B Vice-Chair, Prof. Ari Sihvola.

For the 2019 EMTS, the site will be chosen during the Commission B Business Meetings the Beijing GASS 2014. The present Chair has received a bid from the United States Commission B to hold the Symposium in San Diego, California, USA.

### **5. GASS 2014**

With the help of Conveners, Commission B has been able not only to fill its allocated slots for invited and submitted oral papers, but a substantial number of evenly high-ranking papers had to be moved to the two Commission B Poster Sessions. The Commission B Tutorial will be given by Prof. Stefano Maci, Italy on the following topic: “Controlling Waves on Metasurfaces.”

Commission B Member Nader Engheta, University of Pennsylvania, USA, will be awarded the Balthasar van der Pol Gold Medal, with the following citation: “For groundbreaking contributions and innovations in electromagnetic theory and applications of composite materials, metamaterials and nanoscale optics, bio-inspired imaging and sensing, and material-based optical nanocircuitry.” Moreover, Commission B Member Francesco Paolo Andriulli will be awarded the Issac Koga Gold Medal, with the following citation: “For contributions to computational electromagnetics, specifically the development of preconditioned and stable integral equation solvers.”

Finally, the research work by the recipient of the John Howard Dellinger Gold Medal, Professor Jean-Pierre Bérenger, who has been partially associated with our commission, is directly linked to the field

of interest of Commission B (citation: “For seminal work on the development of breakthrough absorbing boundary conditions for computational electromagnetics in radiosciences”).

## **6. Vice-Chair Election 2014 – 2017**

Two nominations have been received by the Commission:

Kazuya Kobayashi, Japan,  
Sembiam Rengarajan, USA,

The appropriate ballot forms have been sent out by URSI. The final election will take place during the first Commission B Business Meeting during GASS 2014, and will have to be subsequently approved by the URSI Board.

## **7. Early Career Representative (ECR) Election 2014 – 2017**

Two nominations have been received by the Commission:

Joseph Costantine, USA;  
LianLin Li, China, CIE.

The appropriate ballot forms have been sent out by URSI. The final election will take place during the first Commission B Business Meeting during GASS 2014, and will have to be subsequently approved by the URSI Board.

## **8. Publication Matters**

Papers presented during the 2013 International Commission B Symposium on Electromagnetic Theory were published by IEEEExplore. Upon suggestions of session chairs and conveners authors have been invited to contribute to a Special Section of Radio Science; submitted papers are presently under review.

For what concerns the tutorials for the Radio Science Bulletin, a paper on “The Dipole Moment (DM) and Recursive Update in Frequency Domain (RUFD) Methods: Two Novel Techniques in Computational Electromagnetics” has been published in the September 2011 issue. The paper is co-authored by Raj Mittra, Chiara Pelletti, Kadappan Panyappan, and Agostino Monorchio. A paper on “Electromagnetism, Nanotechnologies and Biology: New Challenges and Opportunities” has been published in the June 2012 issue. It is co-authored by Ovidio Mario Bucci and Enrico Bucci. Several other contributions have been invited, but it seems not so easy to obtain submissions.

## **9. URSI Atlantic Meetings and Asia-Pacific Radio Science Conferences (Mid Term Symposia)**

At the 2nd meeting of URSI Council at the occasion of the URSI GASS in Istanbul, the Board proposed to organize scientific meetings in the years in between the GASS. The 3 year period in between the GASS-meetings is felt to be too long for establishing and maintaining a sufficient level of contact and interaction within the URSI community. Since the URSI GASS in Istanbul, the Board has been looking into different options and at the occasion of the last meeting of the Coordinating Committee in April 2013, the proposal was made to have a yearly URSI meeting covering all 10 URSI Commissions. In order to avoid organizing duplicate meetings, it was proposed to incorporate the successful triennial AP-RASC URSI conference in this scheme and to

establish a new triennial event in the Atlantic-region. Consequently, the year after the URSI GASS a URSI Atlantic Meeting will be organized in the European-American (Atlantic) region. Indeed, a new URSI Atlantic Meeting is already scheduled in the Gran Canaria, Spain, May 18-25, 2015.

Anyway, during Commission B Business Meetings at EMTS 2013 in Hiroshima, Members of Commission B unanimously decided that it is crucial for the Commission to continue the long tradition of organizing the triennial Electromagnetic Theory Symposia (EMTS). It was recommended to devote specific attention to avoid interference with the Asia-Pacific Radio Science Conference, which will be held in the same years of the EMTS.