

UNION RADIO-SCIENTIFIQUE INTERNATIONALE INTERNATIONAL UNION OF RADIO SCIENCE



**Rapports des Assemblées Générales de l'URSI
Records of URSI General Assemblies**

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XXXIe Assemblée Générale et Symposium Scientifique
XXXIst General Assembly and Scientific Symposium**

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INTRODUCTION

ACKNOWLEDGEMENT

The XXXIth General Assembly and Scientific Symposium of URSI was held at the Beijing Conference Center, Beijing, CHINA, from 16 to 23 August 2014. In introducing this account of the records, it seems appropriate to offer the warmest thanks of the Union to:

- the Chinese National Committee (CIE) of URSI;
- the Local Organising Committee;
- the Coordinator and the Associate Coordinator of the Scientific Programme;
- the Chairs and Vice-Chairs of URSI Commissions, who planned the scientific sessions, and to the session Chairs and speakers;
- the organisations which provided funds in support of the Young Scientist Programme: the URSI Member Committees in Japan;
- to the sponsors of this meeting : Chinese Institute of Electronics (CIE), China Electronics Technology Group Corporation (CETC), The Radio Association of China and the China Institute of Communication.

The URSI Council - which is composed of the official representatives of the Member Committees - met in Beijing on four occasions between 16 and 23 August 2014. The Resolutions and Recommendations adopted by the Council are reproduced at the end of this volume. Summary accounts of the business transacted by the Council are given elsewhere.

An abundant scientific programme, consisting of 1379 papers (857 oral communications and 522 posters had been prepared for the 1202 registrants. Among them were the 136 Young Scientists, who attended the URSI GASS (142 were awarded a YS Award). The programme consisted of 3 General Lectures, 1 Public Lecture and 10 Tutorials.

The Public Lecture was entitled:

- TD -LTE Evolution and Future 5G Directions

The General Lectures, of interest to all participants, were entitled :

- Energy Harvesting for Autonomous Wireless Sensors and RFID's
- The Square Kilometre Array (SKA)
- Solar Superstorms - a storm in a tea cup or a global risk for society and economies ?

Each Commission had been asked to provide a Tutorial Lecture in its own sphere of interest. The titles of these Lectures were as follows :

- The BeiDou Navigation Satellite System (Commission A)
- Controlling Waves with Metasurfaces (Commission B)
- State of the art mobile radio channel sounding and data analysis (Commission C)
- Terahertz Time-Domain Spectroscopy: Principles and recent Developments (Commission D)
- SKA and EMC: The need for Science and Engineering Dialogue (Commission E)
- Looking at the Earth as a planet : Passive Microwave Remote Sensing of Land Surfaces (Commission F)
- Ionosphere and Plasmasphere Electron Density Profiles (Commission G)
- Theory and Simulations of Nonlinear Wave-Particle Interactions in the Planetary Radiation Belts (Commission H)
- Enabling Technologies for Modern Radio Astronomy (Commission J)
- New Horizons in Bioelectromagnetics and Bioimaging (Commission K)

LIST OF URSI OFFICERS AND OFFICERS OF MEMBER COMMITTEES

Following the elections at the XXXIth General Assembly and Scientific Symposium in Beijing, CHINA, the Officers of the Union and the URSI representatives on other Organisations are as given below. The list of Presidents and Secretaries of URSI Member Committees is based on information available at the URSI Secretariat up to the time of going to press.

HONORARY PRESIDENTS

Prof. J. Van Bladel (Belgium) (U.S.A)

BOARD OF OFFICERS

President: Prof. P. S. Cannon (U.K.)
Past President: Dr. P. Wilkinson (Australia)
Vice-Presidents: Prof. S. Ananthakrishnan (India)
Prof. M. Ando (Japan)
Prof. Y. Antar (Canada)
Prof. U. Inan (U.S.A.)
Secretary General: Prof. P. Lagasse (Belgium)

SCIENTIFIC COMMISSIONS AND COMMITTEE

Commission A:
Chair : Prof. Yasuhiro Koyama (Japan)
Vice-Chair : Dr. Patrizia Tavella (Italy)
ECR : Dr. P.M. Duarte Cruz (Portugal)

Commission B:
Chair : Prof. Ari Sihvola (Finland)
Vice-Chair : Prof. Kazuya Kobayashi (Japan)
ECR: Dr. Lianlin Li (China CIE)

Commission C:

Chair : Prof. Sana Salous (U.K.)
Vice-Chair : Dr. Amir Zaghloul (U.S.A.)
ECR: Dr. Ruisi He (Belgium)

Commission D:

Chair : Prof. Günter Steinmeyer (Germany)
Vice-Chair : Dr. Apostolos Georgiadis (Spain)
ECR: Prof. Arnaud Vena (France)

Commission E:

Chair : Dr. David Giri (U.S.A.)
Vice-Chair : Prof. Frank Gronwald (Germany)
ECR: Dr. Gabriele Gradoni (U.K.)

Commission F:

Chair : Dr. Simonetta Paloscia (Italy)
Vice-Chair : Prof. Vineeth Chandrasekar (U.S.A.)
ECR: Dr. Mehmet Kurum (Turkey)

Commission G:

Chair : Prof. Iwona Stanislawska (Poland)
Vice-Chair : Prof. Patricia Doherty (U.S.A.)
ECR: Dr. Seebany Datta-Barua (U.S.A.)

Commission H:

Chair : Dr. Ondrej Santolik (Czech Republic)
Vice-Chair : Dr. Janos Lichtenberger (Hungary)
ECR: Dr. Wen Li (U.S.A.)

Commission J:

Chair : Prof. Willem Baan (the Netherlands)
Vice-Chair : Dr. Richard Bradley (U.S.A.)
ECR (Chair): Dr. Stefaan Wijnholds (Netherlands)

Commission K:

Chair : Prof. Joe Wiart (France)
Vice-Chair : Dr. Samyoung Chung (South Korea)
ECR: Dr. Puyan Mojabi (Canada)

STANDING COMMITTEES

Standing Publications Committee

Chair : Dr. W. Ross Stone (U.S.A)

AP-RASC Standing Committee

Chair: Prof. K. Kobayashi

Standing Committee on Young Scientists

Chair : Prof. F. Lefevre (France)

Past Chairs Advisory Committee (PCAC)

Chair : Prof. A. Van Deursen (Netherlands)

Scientific Programme for the next URSI GASS

Coordinator : Dr. Y. Yan (China CIE)

Associate Coordinator : Dr. F. Labeau (Canada)

URSI REPRESENTATIVES ON OTHER SCIENTIFIC ORGANISATIONS

COSPAR (Committee on Space Research):

Prof. I. Stanislawska (Poland)

IAU (International Astronomical Union):

Dr. R. Schilizzi (U.K.)

ICG (International Committee on Global Navigation Satellite Systems)

Prof. P. Doherty (U.S.A.)

ICSU (International Council of Scientific Unions):

Prof. P. S. Cannon (U.K.)

Dr. P. Wilkinson (Australia)

ICSU World Data System :

Dr. D. Bilitza (U.S.A)

ISES (International Space Environment Service) :

Dr. M. Terkildsen (Australia)

ISPRS (International Society for Photogrammetry & Remote Sensing)

Prof. T.J. Tanzi

IUCAF (Scientific Committee on Frequency Allocations for Radio Astronomy and Space Science)

Dr. H.S. Liszt (USA, Chairman)

Prof. S. Ananthkrishnan (India, Com. J.)

Dr. W.A. Baan (ex officio)

Prof. I. Häggström (U.S.A., Com. G)

Prof. S.C. Reising (USA, Com. F)

Dr. A.T. Tzoumis (Australia, Com. J)

Dr. W. Van Driel (France, Com. J)

IUGG / IAGA (International Union of Geodesy and Geophysics / International Association of Geomagnetism and Aeronomy) :

Prof. F. Lefevre (France)

SCAR (Scientific Committee on Antarctic Research) :

Dr. G. de Franceschi (Italy)

SCOR (Scientific Committee on Oceanic Research) :

Dr. R. Lang (U.S.A.)

SCOSTEP (Scientific Committee on Solar-Terrestrial Physics) :

Prof. C. Rodger (New Zealand)

WHO EMF (World Health Organisation-Electromagnetic Field Programme)

Prof. B. Veyret (France)

MEMBER COMMITTEES

AUSTRALIA	President : Prof. P. Smith Secretary : Ms. M. O'Brien
AUSTRIA	President : Prof. H. Rucker
BELGIUM	President : Prof. C. De Mol Secretary : Dr. V. Pierrard
BRAZIL	President : Prof. M.S. Assis Secretary : Prof. M.T.M. Rocco Giraldi
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GERMANY	President : Dr. W. Mathis Secretary : Dr. E. Bogenfeld
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HUNGARY	President : Prof. L. Zombory Secretary : Dr. L. Nagy
INDIA	President : Dr. G.S. Lakhina Secretary : Dr. A. Moitra

IRELAND	President : Dr. O'Droma Secretary : Ms. Y. Graham
ISRAEL	President : Prof. E. Heyman Secretary : Prof. R. Kastner
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JAPAN	President : Prof. K. Kobayashi Secretary : Prof. S. Yagitani
NETHERLANDS	President : Dr. Ir. M.J. Bentum Secretary : Dr. R. Serra
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NIGERIA	President : Prof. I.A. Adimula Secretary : Dr. J.S. Ojo
NORWAY	President : Prof. J. Trulsen Secretary : Ms. N. Brynildsen
PERU	President : Dr. J. Heraud Secretary : Dr. E. Pacheco
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Secretary : Ing. A. Garbini
CHILE President : Prof. B. Jacard
IRAQ President : Dr. Eng. S.B. Sadkhan
SINGAPORE: President : Dr. J. Png Ching Eng

URSI SECRETARIAT

Secretary General : Prof. Paul Lagasse
Assistant Secretary General : Prof. Peter Van Daele
Dr. W. Ross Stone (Publications & GASS)
Prof. K. Kobayashi (AP-RASC)
Prof. P.L.E. Uslenghi (AT-RASC)
Secretary : Ms. Inge Heleu (Executive Secretary)
Ms. Inge Lievens (Administrative Secretary)

OPENING MEETING

The Opening Ceremony was held on Sunday 16 August 2014 in the Report Hall of the BCC. The first part of the programme was chaired by Dr. Qianjian Lou, Chairman of the Chinese Institute of Electronics & Governor of Shaanxi Province. The following Chinese distinguished guests were also present and delivered a welcome speech:

- Mr. Wei Miao, Minister of Ministry of Industry and Information Technology (MIIT)
- Dr. Yong Shang, Executive Secretary of China Association for Science and Technology (CAST)
- Mr. Qunli Xiong, President of China Electronics Technology Group Corporation (CETC)

After the welcome addresses of Mr. Wei Miao and Dr. Yong Shang, Dr. Phil Wilkinson, President of URSI, gave his presidential address.

PRESIDENTIAL ADDRESS

by Dr. Phil Wilkinson

Thank you one and all for coming to our General Assembly and Scientific Symposium, or GASS, in Beijing. I say 'OUR' because this meeting, and URSI, belongs to everybody here and everybody who has an interest in radio science.

We come to conferences for many reasons but the most important is to hear and judge new ideas and expose our own ideas to a live audience and seek their critical appreciation of what we have been doing. 'Live feedback' questions - can be a powerful stimulant. Be prepared to stimulate your speakers and they will return the compliment.

But URSI is far more than just a conference, important as this is. Maxwell's treatise, which introduced the equations that later gained his name, was published in 1865 (150 years ago next year). Next year, to commemorate this and other electromagnetic feats, will be the International Year of Light (IYOL). Subsequently, with Maxwell's equations at their heart, radio science has permeated all fields of science. This is the heritage URSI must live up to.

But our discipline's children have not been kind to us. They leave us and disperse our potential. The Internet, intricate communication options, engineering solutions, and many new fields of endeavour dilute our capacity to participate. It is hard to retain all these fields, but you should try.

The URSI Council has recognised these problems, and the key problem is resources, people: you people, your time. You didn't come here just to listen to papers! You want to leverage your contributions, your careers. URSI is not making your participation as effective as it should be.

I have had the good fortune to work with an excellent Board and based on Council's requests we have started the process of change that we hope will deliver more effective use of our resources and make URSI better for you. To this end, we have introduced three changes.

The time between GASS, three years, is too long. Momentum is lost. At the same time many meetings carry the URSI logo, but the return to URSI is hard to measure. The Board will run an Atlantic Meeting - AT-RASC - next year and seek synergies with AP-RASC to provide Scientific Meetings that fill the gap between GASS. Furthermore, we hope our Commissions will transition their inter-GASS meetings into one of these two venues. The Commissions are pivotal to our success. We don't want more meetings, we want more effective meetings. We will work to make this happen.

The Council suggested the Board were 'maybe not as young' as many of the scientists we need to serve at our meetings. To this end, each Commission will elect an Early Career Scientist and this group of people will provide a much needed impetus to future Boards and meetings.

Who are we? The Radioscientist term was an earlier method for identifying our constituents. The Board has proposed strengthening this, providing a threshold for membership so that being an individual member of URSI will have career significance. Importantly, individual members do not have to come from Member Nations. Through this we hope to attract more National Members.

These are early steps to broaden URSI's outreach into the future. How about right now? Attend your Commission Business meetings, propose session topics for the next GASS, offer to convene a session: be a participant.

I would now like to thank our Local Organising Committee for providing the ground support essential for running a GASS. This is the first time the URSI GASS has been held in China. Most important, I want to thank all the people who have contributed

to the development of the scientific sessions. In particular, Professor Ayhan Altintas who became an important late contributor to scientific program. I would also like to thank the Secretariat, who have had a number of important issues to resolve during the preparation of the GASS. We must capitalise more on the highly developed skills of our secretariat in running meetings.

Finally, I would like to welcome our Union guests. We need more interaction with our Union friends. Professor Orhan Altan, representing both ICSU and the GeoUnions. He will tell you about this shortly. Prof. Yun-tai Chen, Institute of Geophysics, China Earthquake Administration representing The International Union for Geodesy and Geophysics (IUGG). Professor Xiao Zuo from Peking University representing The Scientific Committee on Solar-Terrestrial Physics (SCOSTEP).

Enjoy your GASS. Be a vigorous participant. That is why you are here.

REPORT BY THE SECRETARY GENERAL

Professor Paul Lagasse

Minister Wei,
Governor Lou,
Distinguished guests,
Ladies and Gentlemen,

It is the traditional duty of the secretary general to present a concise report of the scientific activities, the finances and the general administrative situation of our Union. In past triennium the Board under the leadership of our president, Prof. Phil Wilkinson, has worked hard to further expand the scientific activities, to stimulate the participation of young and emerging scientists in our Union and to improve the service that URSI can bring to the Radio scientists worldwide.

In order to give you a better perspective on the policies enacted by the Board during the past triennium, allow me to recall very briefly some aspects of the development of URSI. As a scientific Union, URSI is approximately 100 years old. The exact founding date is open for discussion because the First World War intervened in between the first meetings and the formal establishment immediately after the war. The 100th anniversary of URSI will therefore be commemorated at the next General Assembly and Scientific Symposium in 2017. So URSI is nearly 100 years old and over those 100 years the world has changed a lot. As you all know, science in general and radio science in particular has

changed even more. Politicians everywhere at each election now a days promise change. I am certainly not going to discuss any political change but for any organization or institution it is very useful to consider how it should and can adapt to changing times. To paraphrase Darwin: “It is not the strongest species that survive but those that best adapt to changing environments”. Very few companies exist for more than 100 years. Economists call that creative destruction. Universities are known to exist for a long time. Some for hundreds of years. Personally I think the reason is that they consist mainly of a forever young student population. This constantly renewed student population forces universities to adapt to changing times. So how is URSI doing in this respect? How has the way URSI interacts with the radio science community evolved and what avenues should URSI pursue in the near future to improve its functioning? Although, over the past century, research in our field has shifted to a large extent towards industry the majority of the URSI community still comes from universities or government laboratories. This has led the Board to the conclusion that we should focus our actions toward helping and encouraging young and early career scientists to engage in a research career in radio science. A few concrete action points taken so far are the support for student paper competitions at meetings organized by national or regional URSI committees or at other meetings. Secondly the YS program, as one of the URSU flagship programs, is to be expanded further at some URSI meetings. Helping students to come to their first conference and for the first time presenting a paper can give an important boost to their early career. I am sure that most colleagues of my age might still remember how a long time ago we for the first time were given the opportunity to present our research results at a conference and how it influenced our career. Thirdly at this GASS an Early Career Representative will be elected in each commission. We trust that the input from those younger colleagues in the decision making bodies of URSI will allow our Union to better cater for the needs of the young in as much countries and territories as we can reach. Involving students in URSI is our best long-term investment for the future development of URSI.

Our scientific field has also expanded so much that now a days most conferences only cover highly specialized subjects. However at the start of a career it is good to have the opportunity to learn from and come in contact with the wide variety of sub fields that exist in our domain. And even later on in one’s career it is a fact that a lot of breakthroughs are made in the interdisciplinary interaction between scientific fields. Our century old GASS model, which provides us with the opportunity to meet and interact with colleagues working in the 10 URSI Commission fields, is therefore something we should keep and build on as a defining feature of URSI conferences.

In my view the flow of time as we perceive it has changed substantially over the 100 years. Let me reassure the colleagues of commission A that I am well aware that their atomic clocks are still ticking happily at the same rate as years ago. What I mean is that the way we live, work and interact has speeded up considerably. For example when

in the nineteen thirties the GA was held in Australia, people would travel in a leisurely way from Europe to the GA by ship during a couple of weeks, spend a couple of weeks at the GA and travel back by ship. It certainly sounds attractive but today this is no longer an option. In the nineteen thirties a 3 year cycle for the GASS was normal since a yearly cycle would mean that one would spend most of the time travelling. It is my experience after had the honor to serve for 21 years as SG that a 3-year cycle is no longer working. Already the previous Board came to the conclusion that a yearly cycle is necessary to keep people involved and active in the URSI community. As in all venerable institutions there is substantial resistance to change. Nevertheless the current board decided to go ahead with organizing yearly URSI wide symposia and to concentrate the URSI resources on those URSI flagship meetings. In the coming triennium for the first time an URSI wide scientific symposium with a YS program will be held in the year following this GASS. During this GASS more detailed announcements about this meeting will be made. We hope that in time this will grow into one of the symposia by which URSI will foster the exchanges between scientists both within their specific fields but also in a more interdisciplinary fashion among the ten URSI commissions.

Facilitating the exchange of scientific information and results is one of the primary tasks of URSI. Next to our symposia the Radio Science Bulletin thanks to the continuing efforts of Ross Stone has become a respected scientific journal giving radio scientists in depth information about the scientific advances in the various fields encompassed by the URSI commissions. May I use this opportunity to call on all of you to submit papers to the RSB so as to make it a favored means of communication between radio scientists. Similarly we would like to make our electronic newsletter into a forum where national committees can exchange news items, experiences and results of initiatives and activities organized by them on a national or regional level.

En tant que union scientifique URSI est membre de ICSU, qui regroupe au niveau mondial les académies nationales ou organismes équivalents d'un coté et les union scientifiques telles que URSI dans un vaste nombre de domaines scientifiques. La mission de ICSU consiste essentiellement à promouvoir l'excellence de la recherche scientifique interdisciplinaire dans le but de contribuer au développement socio-économique et ceci au niveau mondial. Cette tache est difficile et complexe étant donne la disparité de moyens scientifiques et de niveau de développement existant dans le monde. Engager les unions scientifiques a coopérer dans des grands programmes multidisciplinaires telles que « Future Earth » n'est pas évident non plus. Pour URSI dont le domaine scientifique est davantage oriente vers les techniques et outils technologiques employés par les autres disciplines que vers les effets tels que l'évolution climatologique elle même, il est difficile de réaliser une coopération avec d'autres unions scientifiques. A URSI la tradition veut que le président et le président précédent entretiennent les relations avec ICSU. Je voudrais ici rendre hommage à Phil Wilkinson et François Lefeuvre pour la contribution qu'ils

ont apporté à l'intégration de URSI dans les programmes de ICSU en général et dans le sub-groupe des géo-unions en particulier.

From a financial point of view URSI is still in relatively good shape. This is due to the fact that we still have substantial financial reserves and that for the past two decades the secretariat has been in a constant cost cutting mode. Expenses such as printing and distributing "Modern Radio Science", the "Review of Radio Science" and the RSB have all been cut and we focus now on electronic distribution. To increase our visibility and impact our web site has been updated. On the income side we are faced with diminishing contributions from member committees due to cost cutting in a number of national academies. This is another reason why we should make a more efficient use of our resources by concentrating on a limited number of symposia. URSI has also been fortunate that it received a substantial income from the GASS in Istanbul and we are grateful to the USA member committee, for funding and organising again at this GASS the student paper competition. The extra support received from the member committee of Japan and Italy for our Young Scientist program is highly appreciated. Thanks to this support and to the important contribution from the Chinese committee organising this GASS, URSI is able to support here 137 Young Scientists coming from many different countries.

Let me conclude by thanking all members of the outgoing board for their work, dedication and friendly collaboration in guiding the development of URSI in the past triennium.

Regarding the new board it is my pleasure to announce the results of the elections that were held this morning.

Was elected as:

President: Prof. Paul S. Cannon

As Vice Presidents:

Prof. Subra Ananthakrishnan

Prof. Makato Ando

Prof. Yahia Antar

Prof. Umran Inan

And I thank Council for allowing me to continue to serve as secretary general. I look forward to a fruitful collaboration with this new board.

Let me also express my sincere gratitude to the local organizing committee of this GASS and more in particular to Dr. Lou Qinjian, Mr. Zhou Zixue and Mrs Xu Xiaolan who have worked hard, to make this GASS a success. With regard to the scientific program, I would like to thank Prof. Altintas for his contribution as Scientific Coordinator of this GASS.

Finally my most sincere thanks to the members of the secretariat, Peter Van Daele, Ross Stone, Inge Heleu and Inge Lievens. Their dedication to URSI keeps the secretariat of our union functioning. In the framework of this GASS I would also like to thank Lucy Zhang for her untiring efforts and cooperation with the secretariat for the practical organization of this GASS.

I wish you all a most fruitful, rewarding and pleasant GASS in this magnificent city of Beijing. Thank you.

**MESSAGE FROM THE
INTERNATIONAL COUNCIL OF SCIENCE (ICSU)**

Professor Orhan Altan

ICSU Strategy, 2012-2017 Vision

“A world where science is used for the benefit of all, excellence in science is valued and scientific knowledge is effectively linked to policy-making. In such a world, universal and equitable access to scientific data and information is a reality and all countries have the scientific capacity to use these ...”

Strategic themes



Research Goal

To organise excellent international interdisciplinary research in selected priority areas.

Recent and new initiatives

New

- Future Earth: research for global sustainability
- Urban Health and Wellbeing

“Future Earth”

“Future Earth” is a 10-year initiative on Earth System research for global sustainability. This initiative is intended to bring together and build on the strengths of existing international Global Environmental Change (GEC) programs and incorporates the outcomes of recent visioning and agenda-setting processes led by several Alliance members

Science and Policy goal

To ensure that science is integrated into policy development at the international and national level and that relevant policies take into account both scientific knowledge and the needs of science.

Universality: goal

To promote the freedom and responsibilities of scientists and access to data and information as a critical contribution to strengthening the global science community.

Universality actions

- Freedom and Responsibility (CFRS)
- Data and information access: World data system, CODATA review and Open access policy
- Science education
- Strengthened regional offices

Structure-function goal

To ensure that ICSU has the necessary Membership, partners, structures and resources to deliver its mission efficiently and effectively.

ICSU Membership

ICSU currently has 31 Scientific Union Members and 121 National Scientific Members covering 141 countries. In addition, ICSU has 24 International Scientific Associates.

The GeoUnions: a “Consortium” of 8 Unions Self-organized since 2003 and now a model in ICSU

IAU -International Astronomical Union

IGU -International Geographical Union

INQUA -International Association for Quaternary Research

ISPRS - International Society of Photogrammetry and Remote Sensing

IUGG - International Union of Geodesy and Geophysics

IUGS - International Union of Geological Sciences

IUSS - International Union of Soil Sciences

URSI - International Union of Radio Science

ICSU-GeoUNIONS Projects

UNOOSA-JBGIS and ICSU-GeoUnions Projects

**Mapping GeoUnions to the ICSU Framework for Sustainable Health and Wellbeing:
Focus on sub-Saharan African Cities**


In collaboration with the ICSU Regional Office for Africa

Prepared by the ICSU GeoUnions Joint Science Program Team

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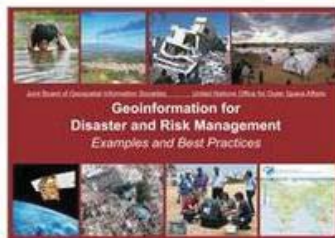
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Geoinformation for Disaster and Risk Management - Examples and Best Practices

You have a very heavy task in the coming days. I wish you a successful meeting !!!
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AWARDS CEREMONY

The Awards Ceremony took place on Sunday, 16 August 2014, just after the Opening Meeting of the General Assembly and Scientific Symposium. The Ceremony was chaired by Professor François Lefeuvre. He gave the floor to Professor van Ardenne, Chairman of the Dutch URSI Committee.

PRESENTATION OF THE BALTHASAR VAN DER POL GOLD MEDAL

by Prof. Arnold van Ardenne, Chairman of the Netherlands URSI Committee

Ladies and Gentlemen,

I feel honored with the request from URSI to present the Balthasar van der Pol Gold Medal today on behalf of the Union Radio-Scientifique Internationale,

Balthasar van der Pol who was born in the Netherlands in 1889, developed a keen interest in, generally speaking, radiowaves. After graduating cum laude in physics from Utrecht University in 1916, he started his research work in Cambridge Cavendish lab in the UK meeting with famous people like Nobel Prize winning Sir Edward Appleton and when back in the Netherlands, with Professor Lorentz. In 1922 and until his retirement in 1949, Balthasar was appointed head of the Philips Research Laboratories in Eindhoven, partly in parallel with his Professorship on theoretical electricity at Delft Technical University. Since 1947 he mainly devoted himself to international activities for example as Director of the International Radio Consultative Committee (CCIR) at Geneva besides being an Honorary Doctor at the University of Geneva and of course, he was an Honorary President of URSI.

The “Balthasar van der Pol Gold Medal” was initiated in 1963 by his then widow, at the occasion of the 14th General Assembly in Tokyo to, among other things, “...stimulate, to work patiently and seriously with the Officers of URSI for radio science in its widest scope”.

Ladies and Gentlemen,

Today the Balthasar van der Pol Gold Medal 2014 has been awarded to a visionary innovator and an internationally renowned pioneer in the fields of optics and electrodynamics; Professor Nader Engheta.

Nader Engheta received his PhD degree in Electrical Engineering and Physics at Caltech in 1982. Several years later, he moved and joined the faculty of the University of Pennsylvania in Philadelphia where he developed an active research program on diverse research topics at the forefront of optics and microwaves, fueled by his creativity and passion for science. He currently holds a Professorship at the University of Pennsylvania, with affiliation in departments of electrical and systems engineering, bioengineering, materials science and engineering, and physics and astronomy. He has a broad spectrum of research activities in the fields of metamaterials, nanophotonics, graphene optics, imaging and sensing inspired by eyes of animal species, optical nanoengineering, microwave and optical antennas, and engineering and physics of fields and waves. Nader's trailblazing work in the development and advancement of these fields has opened up uncharted territories and disciplines, and new vistas and application areas.

One of his most innovative contributions has been the introduction and development of the new field of "optical metatronics", as a new circuit paradigm for information processing at the nanometer scale. As collections of tiny structures, these "circuits with light" may lead to miniaturization of systems with unprecedented possibilities for nanoscale computers and processors. His many discoveries and innovations lead Nader to receive an impressive number of prestigious rewards for example from the IEEE and the American Optical and Physical Societies. He is also an inspired teacher and educator for which he received among others the W. M. Keck Foundation Award. I am sure that Prof. Engheta may even see this list of achievements extended but time forbids me to expand here more.

Given this impressive background, it is a pleasure to now present the URSI Balthasar van der Pol 2014 Gold Medal to Prof Nader Engheta with the award 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.

May I invite you to join me at the podium.

REPLY BY PROFESSOR NADER ENGHETA

Thank you very much, Professor van Ardenne, for your kind and generous words. It is a great pleasure for me to be here today. I am very humbled and honored to receive this award from URSI, and I'd like to thank Dr. Phil Wilkinson, Dr. Paul Lagasse, Professor Francois Lefeuvre, all the members of the URSI Awards Panel, and all the members of the

URSI Board and the local organizing committee, for honoring me with this medal. When I was a student I learned about the nonlinear circuits pioneered by Professor Balthasar van der Pol, and I was fascinated by their features. But in my wildest dream I could not have imagined that one day I would be standing here receiving a medal that is established after his name, so thank you very much for this tremendous honor.

Ideally I would like to thank many individuals, who have helped me over the years to be standing here today, but there is not enough time, so I have to be brief, and please allow me to thank the following people whom I am very much indebted to.

First and foremost, I would like to thank my family, my wife Susanne, and our children Alex and Sarah for their love and support, without which I could not have done anything. So I am very thankful and grateful to them.

Then I would like to thank my mentor, the late Professor Charles Papas of Caltech, who showed me the beauty of electromagnetics and optics and elegance of the Maxwell Electrodynamics. Professor Papas instilled in me the love of science and discovery and he showed me how to enjoy scientific research. Unfortunately, he passed away 7 years ago a few months short of his 90th birthday, and therefore could not be here today. But I am sure his spirit is here and I hope he is smiling.

Then I'd like to thank a dear friend, Professor Andrea Alù, who nominated me for this award. I have had a privilege to know Andrea for many years since 2001 first as a graduate student and then as a postdoc in my group, and now he has his own very successful group at University of Texas at Austin, and we continue our interaction and collaboration together. I am honored that Andrea nominated me for this award, and I thank him for his vote of confidence on me.

Then, I'd like to thank all my students, postdocs, members of my research team and the colleagues and collaborators all over the world, both past and present, for their enthusiasm, motivation and dedication to our joint efforts and interaction. I learn a lot from everyone of them, and I am fortunate to know them all.

And finally, I'd like to thank all of you, my URSI friends and colleagues, for many years of friendship and interactions we have had together, and we continue to have more interaction in the years to come. I learn from all of you, and I am very fortunate to have all of you as my friends and colleagues. Thank you all very much.

PRESENTATION OF THE JOHN HOWARD DELLINGER GOLD MEDAL

by Prof. Steven Reising, Chairman of the U.S. URSI Committee

URSI presents this Gold Medal to honor the memory of John Howard Dellinger, as stated by my predecessor as USNC-URSI President in 1966, “the viability and effectiveness of URSI are due to the efforts of scientists like Dr. Dellinger, a physicist who devoted his career to science in the public service.”

We are extremely glad to present the John Howard Dellinger Gold Medal to Professor Jean-Pierre Berenger, who served the “Centre d’Analyse de Défense” of the Republic of France for 38 years and is presently with JPB consultants. He developed perfectly matched layers, better known as PML, 20 years ago, which, as one of his recommenders says, have “totally revolutionized numerical modeling in electromagnetics.” The citation reads, “For seminal work on the development of breakthrough absorbing boundary conditions for computational electromagnetics in radiosciences.”

REPLY BY PROF. JEAN-PIERRE BERENGER

I am greatly honored to be awarded with the John Howard Dellinger Medal. I would like to thank the Board of URSI for giving me this prestigious award and the Board of the France section for getting me nominated as a candidate.

I have been working for almost four decades on the electromagnetic effects of nuclear rays in the Ionosphere. These include the many disturbances of the radio wave propagation through the Ionosphere. Some have much in common with the ionospheric disturbances by the solar flares, discovered by Dellinger in 1935.

I faced the need of absorbing boundary conditions as early as 1977, as I was working on the nuclear electromagnetic pulse effects. A challenging question was how to replace the infinite space with a finite one. To do this, several boundary conditions were used in acoustics and in electromagnetics, but they were the weak point of the full wave solution of the Maxwell equations.

Later, in 1989, after trying to improve the analytical conditions, without success, I focused on the matched layer condition I have been using for more than one decade. My feeling was that there was too much absorption in the layer, especially at grazing incidence. The idea leads to the perfectly matched layer. The PML immediately showed far better performance than any other existing condition. At this point I think that it will be a significant progress for the kind of problems I used to solve, but I was far from

thinking it would be so widely used in electromagnetism and in other domains. More than twenty years later, the PML is a mature technique, thanks to the many works of others. In particular, the interpretation of the PML as a complex stretch of coordinates by Chew and Weddon, which permitted its extension to any media.

To conclude, I am grateful to the organization I have been with, the Délégation Générale pour l'Armement, which is the procurement agency of the French Ministry of Defense, but where researches were performed in the past. I am also very grateful to the numerical electromagnetic community that welcomed my work on the PML with enthusiasm. This has been a strong encouragement to continue working on the PML and on other subjects of numerical electromagnetism.

PRESENTATION OF THE BOOKER GOLD MEDAL

by Prof. Steven Reising, Chairman of the U.S. URSI Committee

URSI presents this Gold Medal to honor the memory of Henry G. Booker for outstanding contributions to telecommunications or a related discipline of direct interest to URSI. We are exceedingly glad to present the Booker Gold Medal to Professor Harold Vincent Poor, Dean of the School of Engineering and Applied Science at Princeton University.

Prof. Poor has pioneered a general theory of robust statistical signal processing, made fundamental contributions to characterization and detection of signals in non-Gaussian noise environments, and developed powerful signal processing methods for expanding the limits of wireless communication systems. In fact, Google Scholar says that his work has been cited more than 30,000 times, the majority in the past 5 years, and he has an h-index of 77. The citation reads, "For outstanding contributions to the science and technology of communications and signal processing."

REPLY BY PROF. H. VICENT POOR

One of my very first publications as a graduate student was a paper on frequency agile radar presented at an URSI meeting in Atlanta, Georgia, in June of 1974. There was certainly no way at that time that I could have imagined that I would be standing here in Beijing forty years later receiving this award from URSI. It is quite an honor indeed, and I am extremely grateful to my friend and research collaborator, Prof. Marco Luise, who nominated me for this award, to those who supported my nomination, to the selection committee, and to URSI more generally, for this wonderful recognition.

I have been very fortunate that much of my career has coincided with the confluence of two major, and connected, technological advances: the Moore's Law improvements in microelectronics, and the rise of modern wireless communications. These two developments have proven to be exceptionally rich sources of interesting and challenging research problems in signal processing and communications, which continues unabated today. The work that is being recognized by the Booker Gold Medal is a result of this wellspring of intellectual activity inspired by these technologies.

It has also been my great good fortune to have had caring and insightful mentors at critical stages of my life, and to have worked with many talented students and colleagues throughout my career. More than anything, this award is a recognition of the contributions of all of these individuals, and I am delighted to accept it on their behalf, and with the deepest gratitude to them.

PRESENTATION OF THE APPLETON PRIZE

by Dr. Phil Wilkinson, President of URSI

Dr. Wilkinson introduced the winner of the Appleton Prize, Dr. Robert F. Benson, with the following citation : "For fundamental contributions to knowledge of the interactions of space borne radio sounders with the Earth's plasma environment and to the use of sounders as diagnostic probes of that environment".

REPLY BY DR. ROBERT F. BENSON

Thank you Dr. Wilkinson. Thank you Prof. Lefeuvre, other members of the Awards Panel, my Nominators, and the URSI Board for considering me worthy of such a high honor.

Dear colleagues and delegates,

Sir Isaac Newton said that if he appeared to have seen farther than others it was because he stood on the shoulders of giants. In addition to standing on the shoulders of giants, such as Sir Edward Appleton, my accomplishments have been possible because I have had the privilege and opportunity to work with colleagues, many who are no longer with us, that I consider to be giants in the field of ionospheric physics. I wish to acknowledge some of them here.

My introduction to ionospheric research came during my role as an assistant to Willie Hough during the installation and operation of a C-3 ionosonde at the Amundsen-Scott IGY South-Pole Station in 1957. We developed and scaled the 35-mm ionogram films from that refrigerator-sized instrument with 120 vacuum tubes and were relieved to discover that a healthy ionosphere persisted during that first winter of observations at the geographic South Pole. Five years later, technological advances enabled Canadian scientists and engineers, under the leadership of Colin Franklin, to place an ionospheric radio sounder on the Alouette-1 satellite. I was a graduate student at the Geophysical Institute of the University of Alaska at the time under the guidance of George Reid, Gian-Carlo Rumi, and Warren Flock while investigating the effect of line-of-sight aurora on radio-star scintillations and while investigating the ionospheric D-region using ionospheric cross-modulation. I vividly recall my reaction upon first seeing an Alouette-1 ionogram. In addition to the ionospheric long-range reflection traces there were dramatic plasma resonances. They were called “spikes” at that time. I thought how great it would be to be able to work with that data, not realizing that I would spend most of the rest of my life looking at such topside ionograms.

My topside-ionospheric research has been carried out at the Goddard Space Flight Center in Greenbelt, Maryland via collaboration with John E. Jackson, chairman of the ISIS Working Group, and many other scientists at Goddard and from around the world. Please note that the acronym ISIS stand for “International Satellites for Ionospheric Studies.” The spectacular spectrum of sounder-stimulated plasma resonances inspired me to consider the ionosphere as a plasma laboratory for the investigation of plasma-wave phenomena with colleagues Hiroshi Oya, Jacky Bitoun, Yasuhito Kiwamoto, and Vladimir Osherovich where my role sometimes included that of referee. These plasma resonances were also used in investigations of electron temperatures and electron velocity distributions (with Walter Hoegy, Larry Brace, and Adolfo Viñas), and to determine precise values of electron plasma and gyro frequencies in investigations of natural radio emissions such as auroral kilometric radiation and solar radio bursts (with Wynne Calvert, Dave Klumpar, Syun Akasofu, Kit Wong, Gordon James, Joe Fainberg, and Bob Stone), and to provide accurate starting points in the determination of electron-density profiles in equatorial plasma bubbles (with Peter Dyson) and the polar regions (with Joe Grebowsky). A rich spectrum of plasma resonances was also stimulated in the magnetosphere by the Radio Plasma Imager on the IMAGE satellite leading to investigations of plasma-wave propagation, magnetospheric emissions, and accurate magnetospheric electron-density measurements (with Bodo Reinisch, Ivan Galkin Jim Green, Bill Taylor, Shing Fung, Phillip Webb, Don Carpenter, Vikas Sonwalkar and others).

In order to maximize the scientific return from the hundreds of thousands of Alouette/ISIS digital topside-ionogram files that have been created it is necessary that as many as possible be suitable for automatic processing into vertical topside electron-

density profiles. Yongli Wang, Dieter Bilitza, Xueqin Huang, Vladimir Truhlik and I are currently engaged in the process of making improvements to these files with this goal in mind.

Decades ago, Siegfried Bauer encouraged me to join URSI as a member of the new Commission H (Waves in Plasmas). URSI was, and is, an ideal home for my research where I have interacted with many additional colleagues not mentioned above and had the privilege of producing review papers with Ken Davies and Sergey Pulinets.

In closing I want to thank my wife Marilyn who has patiently provided loving support for 56 years that enabled me to pursue my scientific interests.

And again, thanks to URSI for bestowing this great honor to me.

PRESENTATION OF THE ISSAC KOGA GOLD MEDAL

by Prof. Kazuya Kobayashi, President of the Japanese URSI Committee

Ladies and Gentlemen,

Please allow me to introduce a historical background related to the Issac Koga Gold Medal. In 1982, the Japan National Committee of URSI proposed to establish a Gold Medal with the purpose of encouraging young scientists working in the radio science community. This Medal was shortly thereafter established commemorating longtime distinguished services to URSI by a Japanese prominent radioscientist, Professor Issac Koga, who died on September 2, 1982 at the age of 82. Professor Koga was Vice-President of the Union from 1957 to 1963. He was elected President for the period of 1963 to 1966, and remained in the Board as Past President until 1969. The title of Honorary President was conferred on him at the General Assembly in Washington, D.C. in 1981.

Professor Koga's research covered a wide variety of topics in radio science. Particularly noteworthy was his invention in 1932, of a piezo-electric crystal oscillator having an almost zero frequency-temperature coefficient. This is widely known as the Koga cut crystal, and has been used in a wide range of applications, in particular in international radio communications and broadcasting.

The Isaac Koga Gold Medal is awarded to a young scientist who has made outstanding contributions to any of the branches of science covered by URSI Commissions. Candidates must not be older than the age of 35 on September 30 of the year preceding the URSI General Assembly and Scientific Symposium. The Issac Koga Gold Medal was

awarded in 1984 for the first time on the occasion of the Florence General Assembly. The Award at this General Assembly and Scientific Symposium here in Beijing is the eleventh one.

This year's recipient of the Issac Koga Gold Medal is, Professor Francesco Andriulli from the École Nationale Supérieure des Télécommunications de Bretagne (Télécom Bretagne), France. Professor Andriulli is an outstanding young scientist working in the radio science community, particularly in the area of computational electromagnetics. Now, Professor Andriulli, as the President of the Japan National Committee of URSI, it is my privilege and pleasure to present the 2014 Issac Koga Gold Medal to you with the following citation: "For contributions to computational electromagnetics, specifically the development of preconditioned and stable integral equation solvers".

REPLY BY PROF. FRANCESCO P. ANDRIULLI

Thank you very much Prof. Kobayashi for your kind words. I am truly grateful and honored to be here, during this Opening Ceremony, to receive the Koga Gold Medal of this triennium. All my gratitude goes to the URSI Board of Officers, to the Award Panel as well as to all the colleagues who presented and supported my nomination for this award. This medal pleases me for many reasons and I would like to mention just a couple of them that I feel as especially important for me.

Above all, I am particularly glad to receive such an award from URSI. The International Union of Radio Science has played a very important role in my career. I am attending URSI conferences and events since I was a student and I can certainly say that URSI has been a constant and relevant element in my professional development as doctoral student first and then as a faculty member. Moreover, I have been doing electromagnetic research in United States, Italy, and now in France and URSI has been an invaluable resource to re-settle, each time, in a new national scientific community.

In addition, I am also especially glad because this award confirms the continuing interest and support that over the years URSI has been showing to my research field, Computational Electromagnetics. Computational EM is a discipline that impacted profoundly radio science in the past decades and many exciting results have been achieved also thanks to the several outstanding contributions from many URSI members. It is a discipline in many ways mature and powerful, but at the same time very rich of exciting open problems and challenges that are crucial for future applications in engineering and science. I see this medal as an invitation to further engage in these challenges and it is

an invitation that I want to share, especially, with young colleagues and prospective PhD candidates that are thinking of choosing Computational Electromagnetics as their own research focus: computational EM is a discipline which is in constant need of fresh investigation energies and that it can surely be an exciting and rewarding scientific field. I will close by thanking all those colleagues and friends to whom my career is particularly indebted. I wish to thank my PhD advisor, Eric Michielssen, my other Belgian colleagues Kristof Cools and Ignace Bogaert, as well the Italian ones Giuseppe Vecchi, and Roberto Graglia. I also would like to thank the many French colleagues and URSI members that have been so supportive during my new adventure in France of the last few years. I am grateful to every single one of them. Finally, very special thanks go to my PhD students and postdocs, who are sharing their everyday joy and enthusiasm for science. Without this, not much of my work would have been possible.

Again, thank you very much for this medal that honors me profoundly.

PRESENTATION OF THE SANTIMAY BASU PRIZE

by Prof. Subra Ananthakrishnan

Ladies and Gentlemen,

It is my honour and privilege to introduce the 'Santimay Basu Prize and Gold Medal' in honour of my teacher, mentor, philosopher and guide, (late) Dr. Santimay Basu. Dr. Basu was a product of the Institute of Radio Physics and Electronics, University of Calcutta, India but spent most of his prolific research career in the United States where he was closely associated with the Air Force Cambridge Research Laboratory, Massachusetts and the Boston College. His well known expertise was in the area of ionospheric scintillation in which he made very significant contributions. His close collaborator for more than 50 years was his wife Dr. Mrs. Sunanda Basu and we are honoured that she is present in the audience. Dr. Basu's work helped in the development of a global scintillation monitoring network, known as SCINDA, and a satellite system for scintillation forecasting by the US Air Force in 2008. He also worked on the generation of plasma structures in the equatorial ionosphere during intense magnetic storms. Dr. Basu was a role model of the highest caliber for his colleagues, friends and family.

Being full of generosity and kindness towards creating young human resource, Dr. Basu established an annual award for scientists from developing countries, the 'Santimay and Sunanda Early Career Award in Sun Earth Systems Science' in 2008 and the Basu United States Early Career Award for Research Excellence in Earth Systems Science' in 2013. On behalf of Dr. (Mrs.) Sunanda Basu URSI has now established the 'Santimay Basu Prize' which is being given for the first time this year.

The 'Santimay Basu prize and Gold Medal' goes to Dr. Morris Bernard Cohen of the United States of America, a product of Stanford University and a faculty of Georgia Tech, Atlanta, USA.

Professor Cohen, as the Vice-President of URSI, it is my privilege and pleasure to present the '2014 Santimay Basu Prize and Gold Medal' to you, "For contribution to ELF/VLF radio wave instrumentation, propagation, and generation, in the ionosphere and magnetosphere, and for initiating and fostering an international network of young scientists in developing countries".

REPLY BY PROF. MORRIS B. COHEN

To the URSI community: I am sorry that I could not be here personally to accept this award, due to a significant family event. It is an honor to receive this award bearing Santimay Basu's name. The careers of Santimay and Sunanda Basu are an inspiring model, rich with public service, international reach, devotion to students and family, and most certainly, an incredible number of pioneering scientific contributions. I owe a huge thanks to the senior mentorship that has helped me enormously in my early career, including Professor Umran Inan and Professor Don Carpenter.

I thank all my colleagues and students from Stanford, and my new ones at Georgia Tech, for the personal interactions which are the most enjoyable part of a scientific career. I look forward to joining everyone at upcoming URSI meetings.

After the Opening Ceremony a reception was held at the Fountain Square in the gardens of the BCC.

CLOSING MEETING

The Closing Meeting was held on Saturday 23 August 2014 in the Report Hall of the BCC and was chaired by Dr. P. Wilkinson, past President of URSI.

CLOSING REMARKS BY THE SECRETARY GENERAL

Professor Paul Lagasse

Distinguished Guests,
Colleagues,
Ladies and Gentlemen,

At the request of the President, I am pleased to recall the results of the elections of the Board of Officers and to announce the results of the elections of the Chairs, Vice-Chairs and Early Career Representatives of the Commissions for the next triennium. As I mentioned during the opening ceremony the incoming President is Prof. Paul Cannon (UK) and the Vice-Presidents in alphabetical order are: Prof. Subra Ananthakrishnan (India), Prof. Makoto Ando (Japan), Prof. Yahia Antar (Canada) and Prof. Umran Inan (U.S.A.), while I continue as secretary general. Let me welcome the new Board members and thank the outgoing Board members and in particular Prof. François Lefeuvre and Prof. George Uslenghi, who are leaving the Board, for their work and for their dedication to URSI.

The election results of the Chairs and Vice-Chairs of the Commissions are as follows:

Commission A:

Chair	Prof. Yasuhiro Koyama (Japan)
Vice-Chair	Prof. Patrizia Tavella (Italy)

Commission B:

Chair	Prof. Ari Sihvola (Finland)
Vice-Chair	Prof. Kazuya Kobayashi (Japan)

Commission C:

Chair	Prof Sana Salous (United Kingdom)
Vice-Chair	Dr. Amir Zaghloul (U.S.A.)

Commission D:	
Chair	Prof. Günther Steinmeyer (Germany)
Vice-Chair	Dr. Apostolos Georgiadis (Spain)
Commission E:	
Chair	Dr. David Giri (U.S.A.)
Vice-Chair	Prof. Frank Gronwald (Germany)
Commission F:	
Chair	Dr. Simonetta Paloscia (Italy)
Vice-Chair	Prof. V. Chandrasekar (U.S.A.)
Commission G:	
Chair	Prof. Iwona Stanislawska (Poland)
Vice-Chair	Prof. Patricia Doherty (U.S.A.)
Commission H:	
Chair	Prof. Ondrej Santolik (Czech Republic)
Vice-Chair	Prof. Janos Lichtenberger (Hungary)
Commission J:	
Chair	Prof. Willem Baan (the Netherlands)
Vice-Chair	Dr. Richard Bradley (U.S.A.)
Commission K:	
Chair	Prof. Joe Wiart (France)
Vice-Chair	Dr. Samyoung Chung (South Korea)

For the first time in the history of URSI we have elected Early Career Representatives for each commission. The results of this election are:

Commission A:	Dr. Pedro Miguel Duarte Cruz (Portugal)
Commission B :	Dr. Lianlin Li (China, CIE)
Commission C:	Dr. Ruisi He (Belgium)
Commission D:	Dr. Arnaud Vena (France)
Commission E:	Dr. Gabriele Gradoni (United Kingdom)
Commission F:	Dr. Mehmet Kurum (Turkey)
Commission G:	Dr. Seebany Datta-Barua (U.S.A.)
Commission H:	Dr. Wen Li (U.S.A.)
Commission J:	Dr. Stefan Wijnholds (the Netherlands) (Chair ECR)
Commission K :	Dr. Puyan Mojabi (Canada)

Starting from the coming triennium we will have URSI flagship meetings that encompass our 10 commissions so as to maintain the momentum and to increase the interaction within URSI community. The first one will be the AT-RASC meeting to be held next year in May 18th to 23rd. We plan to increase the frequency of our electronic newsletter, starting from next year. We will also further expand our website with extra services in order to increase the value we bring to the URSI members.

Finally Council accepted the invitation of the Member Committee in Canada to organise the next URSI General Assembly and Scientific Symposium. The venue will be Montreal, 19-26 August 2017. The coordinator for the 2017 General Assembly and Scientific Symposium will be Prof. Yihua Yan and the associate coordinator will be nominated later. Council decided for this time not to select the venue of the 2020 General Assembly and Scientific Symposium.

As in previous General Assemblies the quality of the scientific presentations was very high. There was a good balance between contributed papers, invited papers, tutorials, general and public lecture. At this point I would like to express the gratitude of the URSI community to Prof. Ayhan Altintas, the scientific coordinator, Prof. Yihua Yan the associate coordinator, Peter Van Daele, the assistant Secretary General, the commission chairs, vice chairs and convenors who managed to put together the excellent scientific program of this GASS. Let me also thank Dr. Joel Hamelin and Dr. W. Ross Stone who volunteered to serve as the drafting committee during this GASS. Special thanks are also due to the Awards Panel, which under the chairmanship of Prof. François Lefeuvre, managed to bring the difficult selection process to the right conclusion.

During the GASS many practical problems arise that need to be solved. I would like to express my sincere thanks to Lucy Zhang who worked tirelessly in cooperation with Inge Heleu and Inge Lievens to smoothly resolve all those problems.

I know that the GASS with its large number of technical sessions, Council meetings, various committee meetings and its YS program is very complex to organise. From a financial point of view it is also a challenge due to the extensive logistical requirements and the revenue required by URSI. May I in the name of URSI express my deep gratitude and congratulations to the CIE, CETC as main sponsor, the Chinese National URSI committee and the Local organising committee who worked very hard to make this General Assembly a great success. More in particular I would like to thank Zixue Zhou, the chair of the Local Organising Committee, Xianlan Xu, Secretary General of CIE, Jian Wu, Chair of the Chinese URSI Committee and Forrest Lin. A special word of thanks is also due to Beihang University for organising an exceptional successful Young Scientist Party.

I look forward to welcome all of you next year at AT-RASC in Gran Canaria and 3 years from now at the GASS in Montreal.

After the closing remarks by the Secretary General, Professor Zixue Zhou, Chair of URSI GASS 2014 Local Organizing Committee, Chief Economist of Ministry of Industry and Information Technology and Vice Chairman of the Chinese Institute of Electronics gave some closing remarks on the Beijing URSI GASS.

CLOSING REMARKS BY THE OUTGOING PRESIDENT

Dr. Phil Wilkinson

Prof Lagasse has extended his thanks to all concerned with the running of the GASS. I'd like to endorse his comments. From my perspective, it has been a very successful meeting and many people have ensured this happened. Paul and the Secretariat have also given a great deal of their time so we all enjoyed our time in Beijing. My thanks to the whole Secretariat, both in the preparations for the GASS and also their help and presence during the last three years.

Many highlights come to mind during the GASS both among the presented papers and tutorials I attended and during our other activities. I would like to highlight one: shaking hands with the Young Scientists at the Young Scientist reception. With almost 150 hands to shake, by several VIPs, this looked like being a very time consuming task. The Local Organising Committee's solution of having 15 VIPs line up and shake hands with 15 Young Scientists at a time was an elegant solution that I found highly entertaining. Aligning all these people with their certificates could have been worrying, but it wasn't. Congratulations.

I have enjoyed my time as the President of URSI and once again would like to acknowledge the great pleasure I have had working with the Board and the Secretariat. Between us, we have started to change how URSI operates. However, there is still much to do to turn these ideas into effective accomplishments.

The AT Meeting, for instance, will depend on support from the URSI community with a big load falling on the Commission Officers. Paul has already thanked the Chairs for their work in making this GASS successful; I feel I also ought to thank the Chairs and Vice Chairs in anticipation of all the extra work we will ask of them while heavily impacting their budgets.

Similarly, the ECR will depend on support from their Commissions and from younger scientists. They cannot work in isolation and many of their suggestions are likely to end up affecting the Commissions, quite possibly in unexpected ways. Maybe some of the changes will be a little too unexpected; but I am sure we will adjust.

Individual Membership of URSI will grow to embrace all of URSI, providing new resources; new people and many more ideas to stimulate our meetings. It will hopefully also lead to stronger national radio science communities and maybe, eventually, new URSI National members.

Many other Unions own at least one publication where they showcase their science. Our publication is the Radio Science Bulletin. Please read it, support your Commission editors seeking contributions for it with ideas, and hopefully papers. The RSBs primary task is to tell us about ourselves; our science. It also forms part of our outreach to other Unions.

So now I have reached the end of my tenure as President of URSI. It has been both an honour and a pleasure to hold this position for the last three years. I would like to add that while I am the one standing up here, my wife Lorraine has stood beside me throughout. We have both enjoyed our frequent visits to Ghent. I am now very happy to pass over my responsibilities to Paul Cannon, who I am certain will be an excellent URSI President, and I will take on a new role as the past President.

CLOSING REMARKS BY THE INCOMING PRESIDENT

Professor Paul S. Cannon

Ladies and Gentlemen and Colleagues.

I am honoured to be closing this General Assembly as the incoming President and I am indebted to the Council for placing their faith in me. But of course as well as having a new President, URSI has four new VPs and I consider myself extremely fortunate to have such a talented and energetic group of people to work with.

First of all I would also like to thank our local hosts for their hard work, their hospitality and for ensuring that this GASS has not only been scientifically stimulating – but also so enjoyable. Thank you China!

In this final address I would personally like to recognise the significant individual contribution made by Dr Phil Wilkinson who has led a very progressive and effective URSI Board. Fortunately Phil stays on the Board as URSI past President to advise us. I would also like to recognise Prof Francois Lefevre. Francois leaves the Board this year after 12-years – that is three years as VP, nearly 6-years as President - as a consequence of the elected President falling ill - and three years as past President. I am sure that I speak for all of URSI when I thank Francois for all of his hard work.

Radio Science is at the centre of our lives. It provides the means to make fundamental scientific discoveries, it supports our society through increasingly ubiquitous radio systems and it is, itself, the provider of new discoveries. URSI provides a possibly unique link between science and engineering and URSI is a Union where all radio scientists can meet – no matter what their specialism.

So what of URSI in the future? URSI must evolve and we anticipate a number of innovations during the next three years. The progressive agenda will continue. But - as URSI evolves we must surely maintain and strengthen our core attributes – and that includes the inter-commission working which makes URSI unique and attractive to so many.

Historically, the incoming President has exhorted you to attend the next URSI GASS. I am though the first President to say “See you in Gran Canaria for AT-RASC-2015, see you in Seoul for AP-RASC-2016 and see you in Montreal for the GASS-2017.” It is now my official duty, as President of URSI, to declare the 31st General Assembly of the International Union of Radio Science closed.

I wish you all a safe journey home to your family and friends. Thank you.

REPORTS OF MEETINGS

BOARD OF OFFICERS

Summary Report

16 August 2014

The Board reviewed the agenda of the Council meetings and the Coordinating committee meeting. The Board also discussed matters concerning the final preparation of the General Assembly, in particular the opening ceremony, the Young Scientist Party and the Closing Ceremony.

23 August 2014

- The meeting is chaired by the new elected President, Prof. P.S. Cannon who welcomes the newly elected officers of the Board: Prof. S. Ananthakrishnan, Prof. M. Ando, Prof. Y.M.M. Antar, and Prof. U.S. Inan. Prof. P. Lagasse was confirmed to continue as Secretary General, Prof. P. Van Daele as Assistant Secretary General and Dr. W.R. Stone as Assistant Secretary General responsible for publications. Prof. U.S. Inan was appointed as Treasurer. Prof. Y.M.M. Antar will be responsible for National Membership, Prof. S. Ananthakrishnan for Individual Membership and Prof. M. Ando for AP-RASC negotiations.
- The Board members will have access to a special server to exchange information; in between meetings the Board will interact through email.
- To increase the contact and interactions with the URSI Commissions, each Vice-President will serve as a liaison for one or more Commissions:

Prof. Subra Ananthakrishnan	Commissions E & J
Prof. M. Ando	Commissions B, C & K
Prof. U.S. Inan	Commissions G, H & F
Prof. Y.M.M. Antar	Commission A & D

- The President will be copied on all these emails.
- The President and Secretary General will serve as contact to the Past Chairs Advisory Committee (PCAC) and the ECR's.
- It is agreed to waive the registration fee for General Lectures. The Board suggests thanking the tutorial speakers through a brass medal or certificate.
- An URSI Distinguished Service Award will be established to thank individuals who have contributed to the visibility of URSI; the German URSI Member Committee considers to install the 'Karl Rawer Award'
- Council authorized the Board to increase the unit contribution for Member Committees by 5% if other unions are similarly increasing their contributions and if paying authorities will not oppose this increase.

The Board will meet during the AT-RASC 2015 meeting in Gran Canaria on Saturday May 16th and Sunday May 24th, 2015.

COUNCIL

Summary Report

The Resolutions and Recommendations adopted by the URSI Council are reproduced at the end of this volume.

Council met on

Sunday 17 August (8.00 AM to 1.00 PM)

Tuesday 19 August (4.30 PM to 5.30 PM)

Thursday 21 August (5 PM to 7 PM)

Saturday 23 August (8 AM to 10.30 AM).

1. Membership of the Council

President : Dr. P. Wilkinson

Secretary General: Prof. P. Lagasse

Australia: Prof. P. Smith

Austria: Prof. H. Rucker

Belgium: Prof. E. Van Lil

Brazil: Prof. M.S. Assis

Bulgaria: no representative

Canada: Dr. F. Prato

China CIE (Beijing): Dr. R-H Lin

China SRS (Taipei): Prof. H.C. Chang

Czech Rep.: Prof. I. Kolmasova

Denmark: Prof. O. Breinbjerg

Egypt: Prof. S. El-Khamy

Finland: Prof. A. Sihvola

France: Prof. A. Sibille

Germany: Dr. W. Mathis
 Greece: no representative
 Hungary: Prof. J. Lichtenberger
 India: Prof. A. Bhattacharyya (Alt. Prof. Anantha Ramakrishna)
 Ireland: no representative
 Israel: Prof. E. Heyman
 Italy: Prof. R. Sorrentino (Alt. Ms. P. Tavella)
 Japan: Mr. K. Kobayashi
 Netherlands: Prof. A. Van Ardenne
 New Zealand: Prof. C.J. Rodger
 Norway: Prof. J. Trulsen
 Peru: Dr. J. Heraud
 Poland: Prof. J. Modelski (Alt. Dr. A. Witczak)
 Portugal: Eng. H.P. Prazeres
 Russia: Prof. Yu. V. Kuznetsov
 Saudi Arabia: no representative
 Slovak Republic: no representative
 South Africa: Dr. L.A. McKinnell (alt: Dr. G. Wiid)
 South Korea: Prof. S. Nam
 Spain: no representative
 Sweden: Prof. G. Kristensson (Alt. Prof. D. Sjöberg)
 Switzerland: Prof. F. Rachidi (Alt. Prof.N. Mora)
 Turkey: Prof. A. Altintas
 Ukraine: Dr. O. Koloskov
 United Kingdom: Prof. S. Salous (Alt: Prof. I. Glover)
 USA: Prof. S. Reising

Commission A:	Chair:	Dr. W.A. Davis
	Vice-Chair:	Y. Koyama
Commission B:	Chair:	Prof. G. Manara
	Vice-Chair:	Prof. A. Sihvola
Commission C:	Chair:	Prof. M. Luise
	Vice-Chair:	Prof. S. Salous
Commission D:	Chair:	Dr. S. Tedjini
	Vice-Chair:	Prof. G. Steinmeyer
Commission E:	Chair:	Prof. A.P.J. Van Deursen
	Vice-Chair:	Dr. D. Giri
Commission F:	Chair:	Prof. R.H. Lang
	Vice-Chair:	Dr. S. Paloscia
Commission G:	Chair:	Prof. J.D. Mathews
	Vice-Chair:	Prof. I. Stanislawska

Commission H:	Chair:	Prof. O. Santolik
	Vice-Chair:	no representative
Commission J:	Chair:	Prof. J. Jonas
	Vice-Chair:	Prof. W. Baan
Commission K:	Chair:	Prof. M. Taki
	Vice-Chair:	Prof. J. Wiart

The Officers of the Board, the Coordinator of the scientific program and the Assistants Secretary General attended in an advisory capacity. Some Chairs of standing committees and various URSI Officials attended the meetings partially or totally.

2. Elections

The Officers of the Board were elected during the first Council meeting. The result of the election was as follows:

a) President

Three candidates were nominated for President: Prof. Paul S. Cannon (UK), Prof. Prof. Umran S. Inan (USA) and Prof. P.L.E. Uslenghi (USA).

Council elected Prof. P.S. Cannon as President of URSI by secret ballot.

Prof. P.S. Cannon thanked the Council for its confidence and he assured to do his best to serve the Union.

b) Vice-Presidents

The result of the elections for Vice-President, conducted by secret ballot, was as follows:

Prof. Subra Ananthakrishnan

Prof. Makoto Ando

Prof. Yahia Antar

Prof. Umran S. Inan

c) Secretary General

Prof. P. Lagasse was elected for another term by acclamation.

d) Commission Chairs & Commission Vice-Chairs

Council approved the outcome of the elections of the new Commission Vice-Chairs:

Commission A	Chair:	Prof. Yasuhiro Koyama (Japan)
	Vice-Chair:	Dr. Patrizia Tavella (Italy)
Commission B	Chair:	Prof. Ari Sihvola (Finland)
	Vice-Chair:	Prof. Kazuya Kobayashi (Japan)

Commission C	Chair:	Prof. Sana Salous (United Kingdom)
	Vice-Chair:	Dr. Amir Zaghoul (USA)
Commission D	Chair:	Prof. Günter Steinmeyer (Germany)
	Vice-Chair:	Dr. Apostolos Georgiadis (Spain)
Commission E	Chair:	Dr. David Giri (USA)
	Vice-Chair:	Prof. Frank Gronwald (Germany)
Commission F	Chair:	Dr. Simonetta Paloscia (Italy)
	Vice-Chair:	Prof. V. Chandrasekar (USA)
Commission G	Chair:	Prof. Iwona Stanislawska (Poland)
	Vice-Chair:	Prof. Patricia Doherty (USA)
Commission H	Chair:	Dr. Ondrej Santolik (Czech Republic)
	Vice-Chair:	Dr. Janos Lichtenberger (Hungary)
Commission J	Chair:	Prof. Willem Baan (the Netherlands)
	Vice-Chair:	Dr. Richard Bradley (USA)
Commission K	Chair:	Prof. Joe Wiart (France)
	Vice-Chair:	Dr. Samyoung Chung (South Korea)

In case of the election of the Vice-Chair in Commission K, Council voted by show of hands in favour of Samyoung Chung (South Korea). The choice is mainly based on the wish to obtain a better geographical spreading of the country of origin of the Commission Vice-Chairs. This result is formally approved by Council.

e) Election Early Career Representatives (ECR)

The Secretary General reports on the outcome of the elections of the Early Career Representatives.

An extensive discussion on the need for a better geographical spreading of the country of origin for the ECRs precedes the final approval of the results below. In case of the election of the ECR in Commission B, Council votes by show of hands in favour of LianLin Li (China, CIE).

Commission A:	Dr. Pedro Miguel Duarte Cruz (Portugal)
Commission B:	Dr. LianLin Li (China, CIE)
Commission C:	Dr. Ruisi He (Belgium)
Commission D:	Prof. Arnaud Vena (France)
Commission E:	Dr. Gabriele Gradoni (U.K.)
Commission F:	Dr. Mehmet Kurum (Turkey)
Commission G:	Dr. Seebany Datta – Barua (USA)
Commission H:	Dr. Wen Li (USA)
Commission J:	Dr. Stefan Wijnholds (the Netherlands, Chair)
Commission K:	Dr. Puyan Mojabi (Canada)

This result is formally approved by Council.

f) Recommendations for future elections

Prof. P. Wilkinson proposed to make a change in the voting procedure regarding the elections of the Commission Vice-Chairs and the Commission ECRs. The Commission Chairs are advised not to vote in case of a tie, but to leave the decision and final election to Council.

It should be emphasized that the outcome of the elections at the Business meetings of the Commissions is only indicative and that Council can change the order in view of better geographical spreading or taking into account other criteria as e.g. gender issues.

The proposal is unanimously accepted by Council.

3. Establishment of Temporary Committees and Ad Hoc Groups

Council approved the formation of a drafting committee with as members: Dr. J. Hamelin and Dr. W.R. Stone

4. Finances

Prof. P. Smith and Prof. A. Altintas were appointed as members of the Standing Committee on Finances. They examined the report prepared by the Prof. P. Cannon (Treasurer) of the URSI Finances covering the period 2011-2014 and they noted that the accounts have been audited by Ernst&Young. On the basis of this information the report was found to be a fair and reasonable description of the URSI finances.

Council approves the report and thanks the Standing Finance Committee for its work.

Council authorized the Board to increase the unit contribution for Member Committees by 5% if other unions are similarly increasing their contributions and if paying authorities will not oppose this increase.

5. URSI Membership

- Chile, Argentina and Iraq were confirmed as Associate Members.
- Denmark has reinstated the payment of its Membership fee. Council welcomes Denmark back as Member.
- Council approved to admit Singapore as an Associate Member

The URSI Board will be authorized to accept into membership between General Assemblies a country that meets the requirements for membership in the Statutes.

6. Publications

For the next triennium the Standing Committee on Publications will be composed as follows:

- Dr. W. Ross Stone (Chair, Editor of the Radio Science Bulletin)
- Prof. Paul S. Cannon
- Prof. Paul Lagasse (Secretary General)
- Prof. Steven Reising
- Prof. Tulio Tanzi
- Dr. Phil Wilkinson (is hij ook geen Prof.??)

Prof. Paul S. Cannon also announced that he resigned recently as editor of Radio Science. A new editor is being looked for and although AGU will have final decision, it would be nice to have somebody from the URSI community to volunteer for this position.

The Council expressed its sincere thanks to Dr. Stone for all his work and also expressed the gratitude of URSI to him for agreeing to continue as Editor of the Radio Science Bulletin for the next triennium.

7. URSI Flagship Meetings

7.1 Selection of venue of the XXXII nd General Assembly and Scientific Symposium of URSI in 2017

The representatives of Canada (Montreal) and Rome (Italy) gave a presentation about their proposal to host the 2017 General Assembly and Scientific Symposium.

Montreal was elected to host the XXXIIInd General Assembly and Scientific Symposium of URSI in 2017.

Council decides not to select a venue for the GASS 2020 at this time.

7.2 Preparation of Scientific Program and designation of a Coordinator and an Associate Coordinator for 2017

Prof. Yihua Yan accepted to become the Coordinator of the Scientific Program for the XXXIIInd General Assembly.

The GASS 2017 Local Organisers are requested to propose an Associate Coordinator for the Scientific Programme at a later date.

Council also agrees to appoint the URSI Secretariat as Associate Coordinator by definition to assure continuity from GASS to GASS.

7.3 Presentation of AT-RASC 2015

Prof. P. Van Daele gave a presentation on AT-RASC 2015.

The emphasis is laid on the flexibility of the technical programme which will contain both

sessions build around submitted contributions as well as special sessions along topics proposed by end of October. The venue offers the possibility to organize parallel sessions on specific topics covering multiple days. The intention is also to organise workshops and short courses.

The format of the programme schedule would be built on a 20 min frame, but just as in the case of the GASS 2014, flexibility can be offered to the Commission Chairs by subdividing the time-slots of 20 min according to their wishes.

Council decides that no formal meeting of Council will be held at the occasion of AT-RASC 2015.

7.4 Presentation of AP-RASC 2016 (Prof. K. Kobayashi & Prof. Sangwook Nam)

Prof. K. Kobayashi and Prof. Sangwook Nam gave a presentation of AP-RASC 2016.

The composition of the committees regarding AP-RASC 2016 is still subject to change, depending on the outcome of discussions with the URSI Board

8. Paper handling for future General Assemblies

No changes are proposed with respect to the Paper handling procedure for future GASS.

9. Long Range Planning Committee

A presentation is made by Prof.Y. Omura with a set of recommendations which have been formulated by the LRPC:

The following comments were made:

- Implementing a system for Poster Paper Awards is considered to be a good suggestion. This idea as well as the way how to implement this award system needs to be further discussed at the Business meetings of each of the Commissions.
- Care should be taken that correct identification of students can be implemented.
- Regarding the membership of individuals, it is recommended to consider recognition of senior members by “fellows”, or young scientists as life time “URSI associates”. The discussion has already taken place at previous meetings of Council, but then “Fellow” was a mid-career recognition award.

Since the function and membership of the LRPC was not clear enough, the name has been changed to the Past Chairs Advisory Committee (PCAC), to provide better visibility and understanding.

10. Proposals from the Commissions

- Commission A proposes a resolution dealing with the request from ITU regarding the insertion of leap seconds.
- Commission C intends to have two Associate Editors for the RSB
- Commission F wants to expand their field of interest and wants to address more young researchers
- Commission G would prefer to be able to split up the poster sessions according to the sessions with oral papers
- Commission H indicates that student papers should be clearly identified in the programme and the submitted abstracts
- Commission J proposes to shorten the length of the presentations to be able to allocate more oral presentations
- Commission K calls upon all Member Committees to provide updated information on the Officials members to actualise the URSI website

11. Scientific Commissions

Council approved the updated terms of reference of the Commissions, which are:

Commission A on ELECTROMAGNETIC METROLOGY, Electromagnetic measurements and standards.

- The commission promotes research and development of the field of measurement standards and physical constants, calibration and measurement methodologies, improved quantification of accuracy, traceability, and uncertainty. Areas of emphasis are:
 - The 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 and frequency standards;
 - Characterization of the electromagnetic properties of materials, physical constants, and the properties of engineered materials, including nanotechnology;
 - Methodology of space metrology and electromagnetic dosimetry, and measurements for health diagnostics, applications, and biotechnology, including bio-sensing;
 - Measurement 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.

Commission B on FIELDS AND WAVES, Electromagnetic theory and applications.

The interest of Commission B is fields and waves, encompassing theory, analysis, computation, experiments, validation and applications. Areas of emphasis are:

- Time-domain and frequency-domain phenomena;
- Scattering and diffraction;
General propagation , fields and waves in specialised media;
- Guided waves;
- Antennas and radiation;
- Inverse scattering and imaging.

The Commission fosters the creation, development, refinement of analytical, numerical, and measurement techniques to understand these phenomena. It encourages innovation and seeks to apply interdisciplinary concepts and methods.

Commission C on RADIO COMMUNICATION AND SIGNAL PROCESSING SYSTEMS

The Commission promotes research and development in:

- Information theory, coding, modulation and detection
- Spectrum and medium utilization, including cognitive and cooperative techniques
- Wireless networking
- Radar, radio localization and navigation systems
- Green, energy-efficient radio communications

The design of effective radio-communication and signal processing systems also includes scientific, engineering, and economic considerations. This Commission emphasises the scientific aspects of radio communications, but also provides enabling technologies to other areas of radio science.

Commission D on ELECTRONICS AND PHOTONICS

The Commission promotes research and reviews new developments in:

- Electronic systems that push beyond current frontiers;
- Microwave, millimeter wave and THz devices, circuits and systems;
- Nanotechnologies and nanoelectronics;
- Combined and hybrid photonic and electronic systems;
- Photonic devices, systems, and their applications;
- Photonic signal processing schemes, regardless of frequency of signal processed;
- Optoelectronic systems, plasmonics, and electro-optics;
- Physics, theoretical modeling, and numerical simulation of all of the above.

The Commission focuses on electronics and photonics devices, circuits and systems for the purpose of implementing either previously unattainable functionalities or for improving the performance of current electronic-only or photonic-only technologies.

Commission E on ELECTROMAGNETIC ENVIRONMENT AND INTERFERENCE

The Commission promotes research and development in:

- Terrestrial and planetary noise of natural origin including lightning, and seismically associated electromagnetic fields;
- Man-made electromagnetic environments;
- The composite noise environment;
- The effects of noise on system performance;
- The effects of natural and intentional emissions on equipment performance;
- The scientific basis of noise and interference control, and electromagnetic compatibility;
- Spectrum management.

Commission F on WAVE PROPAGATION AND REMOTE SENSING (planetary atmospheres, surfaces and subsurfaces)

The Commission encourages:

- The study of all frequencies in a non-ionised environment :
 - wave propagation through planetary, neutral atmospheres and surfaces;
 - wave interaction with the planetary surfaces (including land, ocean and ice), and subsurfaces;
 - characterisation of the environment as it affects wave phenomena;
- The application of the results of these studies, particularly in the areas of remote sensing and communications;
- The appropriate co-operation with other URSI Commissions and other relevant organisations.

Commission G on IONOSPHERIC RADIO AND PROPAGATION (including ionospheric communications and remote sensing of ionised media)

The goal of the Commission is to study the ionosphere and provide its broad understanding to support the use of radio by society on Earth and in space.

Specific areas of focus include:

- Observation of ionospheric structure, variability, coupling, and trends at all relevant scales;
- Modelling of the ionosphere to enable understanding and prediction of its properties;

- Development of the tools, techniques, and instruments necessary to measure ionospheric properties;
- Theory and practice of ionospheric radio propagation and scattering;
- Applications to radio systems, global navigation, communications, space weather, and situations of global concern.

To further these objectives, the Commission collaborates within URSI and with other concerned organizations and scientific unions.

Commission H on WAVES IN PLASMAS (including space and laboratory plasmas)

The goals of the Commission are:

- To study waves in plasmas in the broadest sense, and in particular:
 - the generation (e.g. plasma instabilities), propagation, and detection of waves in plasmas,
 - wave-wave and wave-particle interactions, plasma turbulence and chaos, spacecraft-plasma interaction, instabilities, heating, and diagnosis of laboratory plasmas;
- To encourage the application of these studies, particularly in the areas of solar/planetary plasma interactions, space weather, and an increased exploitation of space as a research laboratory.

Commission J on RADIO ASTRONOMY

The activities of the Commission include:

- Observation and interpretation of cosmic radio emissions from the early universe to the present epoch, and
- Radio reflections from solar system bodies.

Emphasis is placed on:

- The promotion of science-driven techniques for making radio-astronomical observations and data analysis;
- Support of activities to protect radio-astronomical observations from harmful interference.

Commission K on ELECTROMAGNETICS IN BIOLOGY AND MEDICINE

The Commission is charged with promoting research and development in the following domains:

- Physical interaction of electromagnetic fields (from static to optical) with biological systems;
- Biological effects of electromagnetic fields;

- Mechanisms underlying the effects of electromagnetic fields;
- Exposure systems of experimental electromagnetic fields;
- Assessment of human exposure to electromagnetic fields;
- Medical applications of electromagnetic fields.

12. Scientific Commissions

Council approved the following working groups:

Working Groups 2014-2017

D.1 RFID Technologies and Privacy of Data

Chair: Dr. S. Tedjini (France)

Vice-Chair: Dr. G. Marrocco (Italy)

E.1 Terrestrial and Planetary Electromagnetic Noise Environment

Co-Chairs: Y. Hobara (Japan), K. Hattori (Japan),

A.P. Nickolaenko (Ukraine), C. Price (Israel)

E.2 Intentional Electromagnetic Interference

Co-Chairs: M. Bäckström (Sweden) and W. Radasky (USA)

E.3 High Power Electromagnetics

Co-Chairs: R. L. Gardner (USA) and F. Sabath (Germany)

E.4 Lightning Discharges and Related Phenomena

Co-Chairs: S. Yoshida (Japan) and Dr. V. Rakov (USA)

E.5 Interaction with and Protection of Complex Electronic Systems

Co-Chairs: J-P. Parmentier (France), F. Gronwald (Germany), and H. Reader (South Africa)

E.6 Spectrum Management

Chair: J. P. Borrego (Portugal)

E.7 Geo-Electromagnetic Disturbances and Their Effects on Technological Systems

Chair: A. Viljanen (Finland)

E.8 Electromagnetic Compatibility in Wired and Wireless Systems

Co-Chairs: F. Rachidi (Switzerland) and A. Zeddam (France)

E9. Stochastic Techniques in EMC

Co-Chairs: L. Arnaut (UK), S. Pignari (Italy), and R. Serra (Netherlands)

F.1 Education and Training in Remote Sensing and Related Aspects of Propagation/ Next-Generation Radar Remote Sensing

Chair: M. Chandra (Germany)

Co-Chairs: J. Isnard (France), W. Keydel (Germany), E. Schweicher (Belgium)

G.1 Ionosonde Network Advisory Group (INAG)

Chair: I. Galkin (USA)

Vice-Chairs: J. B. Habarulema (South Africa), Dr. B. Ning (China CIE)

INAG Bulletin Editor: P. Wilkinson (Australia)

G.2 Studies of the Ionosphere Using Beacon Satellites

Chair: P. Doherty (USA)

Honorary Chair: R. Leitinger (Austria)

G.3 Incoherent Scatter

Chair: M. McCready (USA)

Vice-Chair: I. McCrea (UK)

K.1 Stochastic Modeling for Exposure Assessment

Co-Chairs: Dr. J. Wiart (France) and Dr. T. Wu (China CIE)

Joint Working Groups

EFGHJ. RFI Mitigation and Characterization

Chair for Commission E: F. Gronwald (Germany)

Chairs for Commission F: A. K. Mishra (South Africa), D. Le Vine (USA)

Chair for Commission G: T. Bullett (USA)

Chair for Commission H: H. Rothkaehl (Poland)

Chairs for Commission J: R. Bradley (USA), W. Baan (Netherlands)

EGH. Seismo Electromagnetics (Lithosphere-Atmosphere-Ionosphere Coupling)

Chair for Commission E: Y. Hobara (Japan)

Chair for Commission G: S. Pulnits (Russia)

Chair for Commission H: H. Rothkaehl (Poland)

EHG. Solar Power Satellites

Chair: H. Matsumoto (Japan)

Co-Chair for Commission E: J. Gavan (Israel)

Co-Chair for Commission H: K. Hashimoto (Japan)
Co-Chair for Commission G: K. Schlegel (Germany)

FG. Atmospheric Remote Sensing Using Satellite Navigation Systems
Co-Chairs for Commission F: N. Floury (Netherlands) Chair for Commission G: C. Mitchell (UK)

GF. Middle Atmosphere
Chair for Commission F: Dr. F. Marzano (Italy)
Co-Chairs for Commission G: J. L. Chau (Peru), E. Kudeki (USA)
GH. Active Experiments in Plasmas
Chair for Commission G: T. Pedersen (USA)
Chair for Commission H: M. Kosch (South Africa)

HJ. Computer Simulations in Space Plasmas
Co-Chairs for Commission H: Y. Omura (Japan) and B. Lembege (France)
Chair for Commission J: K. Shibata (Japan)

Inter-Commission Data Committee
Chair: S. Wijnholds (the Netherlands)

Inter-Union Working Groups

URSI/IAGA VLF/ELF Remote Sensing of the Ionosphere and Magnetosphere (VERSIM)
Chair for URSI (Commissions E, G, H): M. Clilverd (UK)
IAGA Chair: J. Bortnik (USA)

URSI/COSPAR on International Reference Ionosphere (IRI)
Chair: D. Altadill (Spain)
Vice-Chair for URSI: V. Truhlik (Czech Republic) Vice-Chair for COSPAR: S. Watanabe (Japan) Secretary: D. Bilitza (USA)

URSI/IUCAF Inter-Commission Working Group on Radio Science Services
Chair for IUCAF: Dr. W. Van Driel (France)(ex officio)

URSI/IAU Inter-Union Working Group on the History of Radio Astronomy
Chairs: R. Schilizzi (UK), R. Wielebinski (Germany)

Names have been updated to reflect recent changes.

CO-ORDINATING COMMITTEE

Summary Report

The Co-ordinating Committee met on Saturday 16 August 2014 (2.00 PM to 6.00 PM) and Saturday 23 August 2014 (3.00 PM to 5.00 PM).

1. First Co-ordinating Committee meeting

1.1 Local arrangements for the Beijing GASS (Mrs. 'Lucy' Yimin Zhang, LOC)

Mrs. Zhang made a short presentation regarding the final arrangements with respect to the URSI GASS and included some information on

- Registration desk
- Arrangements for Opening Ceremony
- Meeting rooms & Exhibition space
- Banquet and YS Party
- Certificate of attendance
- Social arrangements & Social programs
- WiFi availability
- Currency and hotel information

1.2 Scientific Program (Prof. A. Altintas)

An overview was presented of the submission process and the formation of the scientific programme.

Over all commission together, a total of 1300 papers were accepted, of which 800 oral papers and 500 posters.

Suggestions made for future GASS:

- a paper should always be automatically scheduled as poster if requested by the author
- stricter submission deadline
- when submitting a paper, assignment to a commission is mandatory

1.3 Proposed guidelines for future General Assemblies

Commissions are asked to use their Business Meetings to discuss the scientific issues for future GASS.

1.4 Instructions to Commissions and Matters for Business Meetings

Professor Lagasse instructed the Commissions Chairs about the following matters:

- Review and update of the terms of reference according to developments in recent years
- Scientific report (by the incoming Chairs) on the business transacted during the General Assembly (for the Records of the General Assembly and the Radio Science Bulletin)
- Resolutions and recommendations
- Procedure for the election of Vice-Chairs and ECRs
- Responsibilities of Chairs and Vice-Chairs and ECRs
- A dedicated Associate Editor for the Radio Science Bulletin is to be appointed
- Reconstitution and creation of working groups for the following triennium
- Proposed supported meetings for 2014-2017 & use of Commission Budget

1.5 AT-RASC 2015

Prof. P.L.E. Uslenghi informed the Commission Chairs about the following attention points:

- Programme format
- Student Paper Competition
- Abstract submission
- Topics of Interest & Special Sessions
- Paper review & Technical Programme Committee
- Copyright & Proceedings
- Advertisement
- Business Meetings

1.6 The Young Scientist Program at the GASS 2014 & AT-RASC 2015

The Young Scientists Programme is very important for URSI and should therefore be pursued. Prof. Lagasse mentioned that 137 YS are supported at the 2014 GASS, the highest number ever.

The YS programme will also be implemented at AT-RASC 2015. Fifty Young Scientists will receive support from URSI central funds.

1.7 Publications (Dr. W.R. Stone)

A presentation is made by Dr. Ross Stone. There are 4 action points for Business Meetings:

- Appoint one or two Commission Editors for next triennium (by Tuesday evening)
- Topics and authors for Reviews of Radio Science for next triennium
- Papers from Tutorial and General Lectures for invited papers RSB
- Encourage special issues

2. Second Co-ordinating Committee meeting

2.1 Lessons learned from the GASS 2014

All Commission representatives were asked to provide brief comments on the activities and lessons learned from the 2014 GASS.

2.1.1 Logistics

- Screens should be positioned higher and should be visible to the speaker
- 2 microphones should be available per room for questions
- A faster problem solving in case of technical problems is required
- Same room (same capacity) for all tutorials
- There should be a gap between tutorial and normal sessions (for presentation upload)
- Technical sessions should not be scheduled in parallel to the Council meeting
- It is recommended not to present IP-sensitive material on the presentation computers
- Posters should be kept on display much longer time and should be clearly identified with individual numbers
- Enough area in front of the posters for interaction with peers and authors
- More than 1 key for the rooms for Commission Chairs and Vice-Chairs.
- Faster and better internet access through WiFi everywhere
- More attractive venue and faster shuttle service

2.1.2 Scientific Programme

- The scientific quality of the papers was very good
- The commission representatives should have a detailed plan with suggested topics and sessions at the CC meeting at AT-RASC 2015 and AP-RASC 2016 to avoid conflicts with other commissions

2.1.3 Programme booklet & on-line programme

- There should be easy identification of parallel sessions and contributions from authors in the programme booklet
- The online electronic programme was very useful but the USB stick should be more user-friendly (no additional software required)

2.2 URSI website and Mailing lists

To update the URSI website, the Commission Chairs are requested to contact the official members to obtain updated information. The future of URSI is very dependent on its ability to contact radio scientists throughout the world.

Therefore the Commission representatives are called upon to develop a mailing list based on their personal knowledge and participant list from other recent meetings. These mailing lists will be incorporated into the URSI database

Older RSB issues will be scanned and be made available on the URSI website

2.3 AT-RASC 2015

2.3.1 Advertisement

AT-RASC must be seen as a new source of revenue for URSI, therefore its financial and professional success is very important

The advertisement of AT-RASC should be very aggressive and proactive since it's a new Conference, by soliciting the submission of papers.

The Commission Chairs should focus on the GASS and the Commission Vice-Chairs on AT-RASC, but they should also work together with the ECRs as a team.

2.3.2 Tutorials and General Lectures

The attraction of URSI meetings lies in the multidisciplinary of the programme offered. Young researchers attend Tutorials and General Lectures in several Commissions to broaden their field of expertise. Therefore one Tutorial per Commission and daily Plenary General Lectures will be scheduled in the AT-RASC Programme.

2.3.3 Workshops and Short Courses

Since the AT-RASC venue offers many possibilities, the Commissions are required to provide the Board and the Secretariat with proposals for Workshops, Short Courses and co-located Conferences. Bringing established conferences into AT-RASC is of mutual logistic and organizational benefit.

2.3.4 Resources to attract top-notch speakers

To attract more attendees and for advertising the event, the idea was raised to establish a fund which can be used by the Commissions to invite top-notch speakers The Board decided to limit the support of such speakers to waiving the registration fee.

2.4 AP-RASC 2016

AP-RASC is not yet an URSI flagship meeting but will be gradually integrated into the yearly cycle of URSI flagship meetings in the future. For this purpose, the organizing committees will be more compact and may involve Commission past Chairs, Chairs and Vice-Chairs.

The attendance of the Commission Chairs is required at the Coordinating Committee meeting, which will be held at the AP-RASC 2016, where the GASS 2017 Programme will be finalized.

2.5 Associate editors for the RSB

All commissions have appointed 1 or 2 Associate editors for the RSB.

2.6 Guidelines for Chairs, Vice-Chairs and ECRs

These guidelines have been significantly re-edited. All people involved are requested to report on inconsistencies or shortcomings in this ‘living’ document.

2.7 Commission Budget

The budget of the Commissions remain at 9000 euro and should cover the attendance of the Commission Vice-Chair and ECR at both AT-RASC 2015 and GASS 2017.

Commission Chairs are discouraged to spend small amounts on small meetings, since it does not contribute to the visibility of URSI.

All Commission Chairs are also asked to provide an outline budget by the end of December.

2.8 Exhibitions co-located with URSI Meetings

Over the past years, several attempts with limited success have been made to attract industrial interest in URSI Meetings. A space will be available for exhibitions and other alternative options, which will be tried out at AT-RASC 2015.

The next CC meetings will be held at the AT-RASC 2015 Meeting (Saturday May 17th and Saturday May 23th), ExpoMeloneras, Gran Canaria.

TREASURER'S REPORT ON URSI FINANCES

General overview of income and expenditure

The attached balance sheets show a summary of URSI finances for the past triennium. URSI finances are audited annually by Ernst & Young; no specific issues have been raised during the audits.

National subscriptions have historically formed the major element of URSI's income. However, the last 3-years have continued a worrying trend with falling national subscriptions (as illustrated in Figure 1). The fall over the six year period is ~100k€. Recalling that 2008 and 2011 were GASS years, Figure 1 also illustrates an increase in total income during those years.

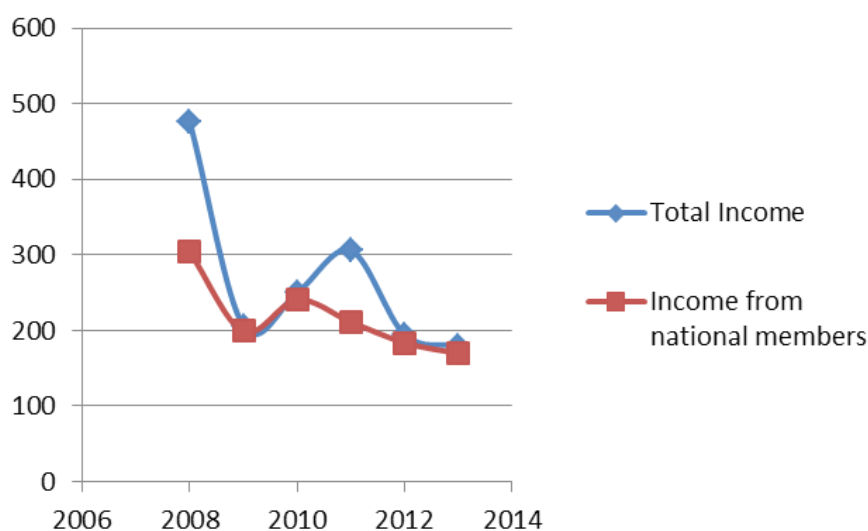


Figure 1: Income in k€

Figure 2, however, describes another view of income, but in relation to expenditure. Not only are the GASS years high income years, they are also high expenditure years. In summary URSI has been running a small deficit for the period 2011-2013 and is set

to run an increasing deficit unless steps are taken to rectify the situation.

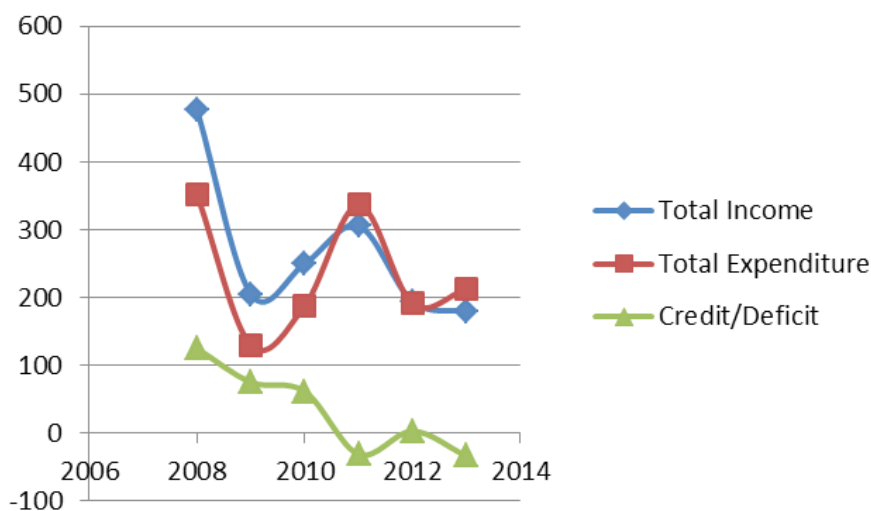


Figure 2: Income and Expenditure in k€

Assets

During the triennium URSI assets invested in the USA were repatriated to Europe to simplify the management of those funds.

The total net value of URSI assets increased from 607 k€ at the end of 2007 to 911 k€ at the end of 2010, but since then has fallen to 851 k€. The share of unallocated assets vs. total assets was 48% at the end of 2010; it is now 32%. The current level of URSI assets is currently around four times the yearly expenditure of URSI which is facilitating the various new URSI initiatives.

General remarks

Reducing ineffective expenditure has been foremost in the Board's mind. But increasing income is at least as important and is one reason why the AT-RASC meeting is being organised by URSI for URSI. Ensuring that income from future GASS meets expectations is also critical. To this end, the current Board is recommending that the GASS 2020 venue is selected 6 years in advance so that new measures for running the GASS can be put in place.

Each Scientific Commission was allocated 9 k€ during the triennium for scientific activities; this will continue into the next triennium but with an expectation that the URSI flagship meetings will be supported ahead of other activities. Funding has been allocated to transition to this new protocol.

Outlook for the next triennium

The financial strength of URSI enables it to run a deficit for a short period – providing that a clear strategy is articulated to reverse that situation. The Board's strategy includes a plan to run a triennial AT-RASC meeting and tighter control over GASS income. The current prognosis for the 3-year cycle 2014-2017 shows a total deficit of more than of 200 k€, due to the startup costs of AT-RASC.

To achieve success URSI will need the full and active support of both the Council and the Commissions at the AT-RASC meeting. Moreover it will require sober consideration of the financial security of the bids for the next and following GASS.

Acknowledgement

I would like to express my sincere thanks to Secretary General and the staff of the Secretariat in Ghent for their highly professional handling of day-to-day finances.

Prof Paul S. Cannon
Honorary Treasurer

**INTERNATIONAL UNION OF RADIO SCIENCE (URSI)
BALANCE SHEET: 31 DECEMBER 2013**

	EURO		
	31.12.2013	31.12.2012	31.12.2011
ASSETS			
Dollars			
Fortis	4,850.17	0.00	6.64
Smith Barney Shearson	0.00	0.00	4,783.19
	4,850.17	0.00	4,789.83
Euros			
Banque Degroof	86.10	152.08	25.38
Fortis zichtrekening	53,469.81	91,154.99	128,664.53
Fortis spaarrekening	155,954.83	155,180.02	382,216.38
Fortis portefeuillerekening	241,549.88	363,784.22	0.00
	451,060.62	610,271.31	510,906.29
Investments			
Degroof Bonds EMU (formerly Demeter Sicav Shares)	22,681.79	22,681.79	22,681.79
Rorento Units	111,614.53	111,614.53	111,414.88
Degroof Monetary Eur Cap (formerly Aqua-Sicav)	63,785.56	63,785.56	63,785.56
Bonds	230,000.00	104,000.00	0.00
Massachusetts Investor Fund	0.00	0.00	252,722.23
Provision for (not realised) less value	0.00	0.00	(7,314.98)
Provision for (not realised) currency differences	0.00	0.00	(59,747.62)
	428,081.88	302,081.88	383,541.86
673 Rorento units on behalf of van der Pol Fund	12,214.69	12,214.69	12,414.34
	440,296.57	314,296.57	395,956.20
Petty Cash	71.22	63.23	1.93
Total Assets	896,278.58	924,631.11	911,654.25
Less Creditors			
IUCAF	28,037.74	22,257.84	14,378.84
ISES	5,053.53	5,901.31	4,454.13
	(33,091.27)	(28,159.15)	(18,832.97)
Balthasar van der Pol Medal Fund	(12,214.69)	(12,214.69)	(11,863.96)
NET TOTAL OF URSI ASSETS	850,972.62	884,257.27	880,957.32

	EURO		
	31.12.2013	31.12.2012	31.12.2011
The net URSI Assets are represented by:			
Closure of Secretariat			
Provision for Closure of Secretariat	100,000.00	100,000.00	100,000.00
Scientific Activities Fund			
Scientific Activities in 2014	55,000.00	55,000.00	45,000.00
Routine Meetings in 2014	15,000.00	15,000.00	0.00
Publications/Website in 2014	15,000.00	15,000.00	20,000.00
Young Scientists in 2014	0.00	0.00	0.00
Administration Fund in 2014	105,000.00	105,000.00	105,000.00
I.C.S.U. Dues in 2014	10,000.00	10,000.00	10,000.00
	200,000.00	200,000.00	180,000.00
XXIX General Assembly 2012/2014 Fund:			
During 2009 - 2010 - 2011 (GA 2011)	0.00	0.00	0.00
During 2012 - 2013 - 2014 (GA 2014)	275,000.00	100,000.00	0.00
Total allocated URSI Assets	575,000.00	400,000.00	280,000.00
Unallocated Reserve Fund	275,972.62	484,257.27	600,957.32
	850,972.62	884,257.27	880,957.32

**Statement of Income and expenditure
for the year ended 31 December 2013**

	EURO		
	31.12.2013	31.12.2012	31.12.2011
I. INCOME			
Grant from ICSU Fund and US National Academy of Sciences	0.00	0.00	0.00
Allocation from UNESCO to ISCU Grants Programme	0.00	0.00	0.00
UNESCO Contracts	0.00	0.00	0.00
Contributions from National Members (year -1)	21,313.00	4,060.00	10,149.00
Contributions from National Members (year)	146,148.00	142,088.00	162,385.00
Contributions from National Members (year +1)	2,030.00	37,552.00	38,567.00
Special Contributions	0.00	0.00	0.00
Contracts	0.00	0.00	0.00
Sales of Publications, Royalties	230.00	160.00	680.00
Sales of scientific materials	0.00	0.00	0.00
Bank Interest	2,979.59	3,863.80	4,912.33
Other Income	6,691.39	6,690.70	88,979.74
Total Income	179,391.98	194,414.50	305,673.07
II. EXPENDITURE			
A1) Scientific Activities	68,389.17	65,691.57	197,329.07
General Assembly 2008/2011/2014	119.40	24,611.00	188,168.24
Mid Term Meetings 2015	13,919.65	0.00	0.00
Scientific meetings: symposia/colloquia	48,181.61	7,870.75	9,160.83
Working groups/Training courses	0.00	0.00	0.00
Representation at scientific meetings	6,168.51	16,495.82	0.00
Data Gather/Processing	0.00	0.00	0.00
Research Projects	0.00	0.00	0.00
Grants to Individuals/Organisations	0.00	0.00	0.00
Other	0.00	16,714.00	0.00
Loss covered by UNESCO Contracts	0.00	0.00	0.00
A2) Routine Meetings	28,540.81	14,569.92	13,303.47
Bureau/Executive committee	28,540.81	14,569.92	13,303.47
Other	0.00	0.00	0.00
A3) Publications	0.00	3,345.71	13,227.69
B) Other Activities	11,991.00	9,296.00	2,000.00
Contribution to ICSU	9,991.00	7,296.00	0.00
Contribution to other ICSU bodies	2,000.00	2,000.00	2,000.00
Activities covered by UNESCO Contracts	0.00	0.00	0.00
C) Administrative Expenses	103,755.65	98,211.35	110,668.29
Salaries, Related Charges	89,524.95	88,668.31	83,169.19
General Office Expenses	3,936.13	2,881.88	3,774.86
Travel and representation	1,842.70	1,003.84	13,488.40
Office Equipment	0.00	3,548.13	2,742.47
Accountancy/Audit Fees	4,689.56	5,469.20	5,747.50
Bank Charges/Taxes	4,121.72	5,640.65	3,062.50
Loss on Investments (realised/unrealised)	(359.41)	(9,000.66)	(1,316.63)
Total Expenditure:	212,676.63	191,114.55	336,528.52
Excess of Expenditure over Income	(33,284.65)	3,299.95	(30,855.45)
Currency translation diff. (USD => EURO) - Bank Accounts	0.00	0.00	12.55
Currency translation diff. (USD => EURO) - Investments	0.00	0.00	505.83
Currency translation diff. (USD => EURO) - Others	0.00	0.00	134.92
Accumulated Balance at 1 January 2013	884,257.27	880,957.32	911,159.47
	850,972.62	884,257.27	880,957.32

ADDITIONAL INFORMATION

Rates of exchange

January 1, 2013	0.7540 EUR
December 31, 2013	0.7250 EUR

	EURO		
	31.12.2013	31.12.2012	31.12.2011
Balthasar van der Pol Fund			
673 Rorento Shares : market value on December 31 (Aquisition Value: USD 12.476,17/EUR 12.214,69)	36,335.27	36,570.82	33,789.60
<u>Book Value on December 31, 2013/2012/2011/2010</u>	12,214.69	12,214.69	12,414.34
Market Value of investments on December 31, 2013-2010			
Degroof Bonds EMU (formerly Demeter Sicav Shares)	80,553.00	78,780.90	70,679.40
Rorento Units (1)	701,870.00	706,420.00	642,200.00
Degroof Monetary Eur Cap (formerly Aqua-Sicav)	90,032.29	89,919.95	89,696.64
Massachusetts Investor Fund	0.00	0.00	185,659.63
Bonds	235,584.68	109,627.14	0.00
	<u>1,108,039.97</u>	<u>984,747.99</u>	<u>988,235.67</u>
<u>Book Value on December 31, 2013/2012/2011/2010</u>	440,296.57	314,296.57	395,956.20

(1) Including the 673 Rorento Shares of v d Pol Fund

APPENDIX

Detail of Income and Expenditure

I. INCOME

Other Income

Income General Assembly 2011	0.00	6,380.00	88,234.00
Young scientist support (Japan)	3,815.00	0.00	0.00
Income bonds	2,876.39	260.70	0.00
Other	0.00	50.00	745.74
	6,691.39	6,690.70	88,979.74

II. EXPENDITURE

General Assembly 2011

Organisation	0.00	23,561.12	38,181.05
Young scientists	0.00	0.00	28,535.00
Expenses officials	0.00	914.53	73,681.44
Support Commissions	0.00	0.00	47,770.75
General Assembly 2014			
Organisation	119.40	135.35	0.00
	119.40	24,611.00	188,168.24

Symposia/Colloquia/Working Groups

Commission A	1,000.00	0.00	0.00
Commission B	9,000.00	0.00	0.00
Commission C	2,000.00	2,500.00	0.00
Commission D	1,000.00	0.00	0.00
Commission E	3,250.00	520.75	1,000.00
Commission F	7,400.00	1,500.00	0.00
Commission G	3,100.00	500.00	2,500.00
Commission H	3,581.61	1,500.00	1,000.00
Commission J	2,600.00	0.00	981.38
Commission K	9,000.00	0.00	0.00
Central Fund	4,750.00	0.00	2,796.75
Central Fund (Student Award MC)	1,500.00	1,350.00	882.70
	48,181.61	7,870.75	9,160.83

Contribution to other ICSU bodies

IUCAF	2,000.00	2,000.00	2,000.00
	2,000.00	2,000.00	2,000.00

Publications

Printing 'The Radio Science Bulletin'	0.00	1,570.51	5,671.46
Mailing 'The Radio Science Bulletin'	0.00	1,775.20	7,556.23
	0.00	3,345.71	13,227.69

REPORTS OF THE **STANDING COMMITTEES**

URSI STANDING COMMITTEE ON PUBLICATIONS

August 2014

1. Radio Science Bulletin (and Reviews of Radio Science)

The Radio Science Bulletin (RSB) continues to have strong technical content and to be well received. Our rate of paper submissions has been improving, primarily due to special issues. Although we have had some improvement in submissions from the Commissions, a lack of input from the Commissions continues to be a problem.

Through the early part of 2012, we had been running at three papers per issue. However, that dropped to two papers per issue since then, and we almost didn't have a paper for the March 2013 issue. Subsequent to that, we have done rather well

Special sections have proven to continue to be very good sources of excellent papers, with five special issues through the last two triennia. So far in this triennium we have had three special issues, with two in the last year. The first was in the December 2011 issue, a special section on "Wireless Sensor Networks." That special section had three papers, with a fourth paper based on a General Lecture from the Istanbul GASS also appearing in the issue.

The subsequent two special sections were both on "The Role of Radio Science in Disaster Management." One was in the June 2013 issue, and the second was in the March 2014 issue. The June 2013 issue had three papers in the special section plus two additional papers; the March 2014 issue has three papers. There is also a special section in the June 2014 issue: the winners of the student paper competition from the 2013 AP-RASC. This section has five papers, and the issue also has one tutorial from the GASS and an additional paper.

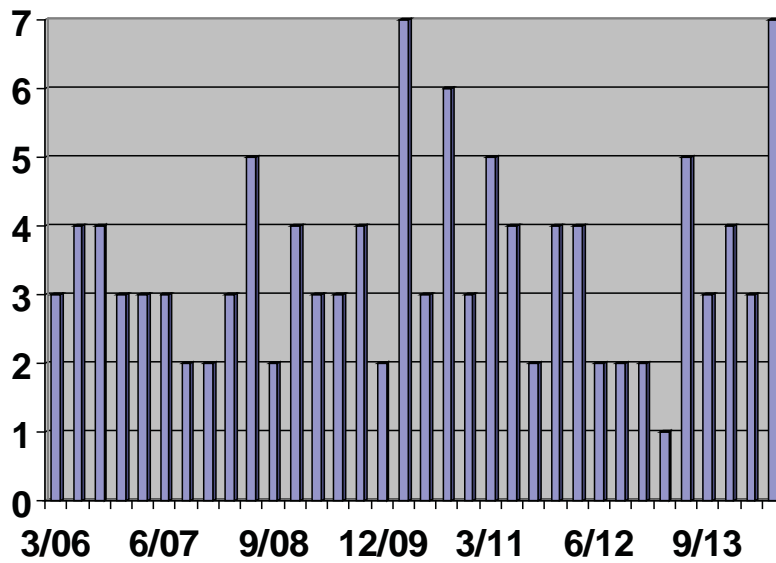


Figure 1. The number of papers published per issue in the Radio Science Bulletin.

Figure 1 shows the number of papers we have had in each issue since September 2005. As a reminder, the following issues had special sections:

- December 2008: Second section on Jenifer Haselgrove, five papers
- March 2010: First section on “High-Altitude Platforms,” five papers, seven total
- September 2010: Second section on “High-Altitude Platforms,” three papers, six total
- March 2011: Section on “Computational Electromagnetics,” three papers, five total
- June 2011: AP-RASC’10 Student Paper Competition winners issue, four total
- December 2011: Section on “Wireless Sensor Networks,” three papers, four total
- June 2013: Section on “Role of Radio Science in Disaster Management,” three papers, five total
- March 2014: Section on “Role of Radio Science in Disaster Management,” three papers, three total
- June 2014: Section on AP-RASC’13 Student Paper Competition winners, five papers plus two additional papers

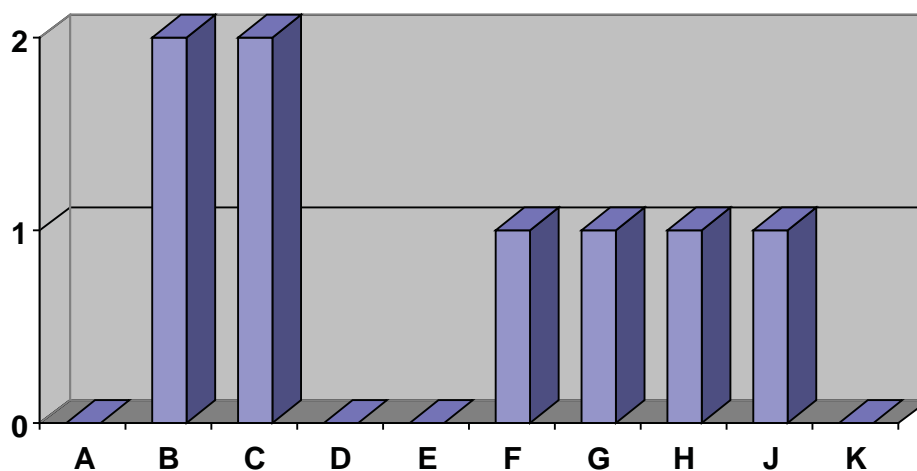


Figure 2. The number of Reviews from each Commission in the current triennium.

At Phil Wilkinson's suggestion, Ondrej Santolik took over the job of coordinating the Reviews of Radio Science after the Istanbul GASS. Asta Pellinen-Wannberg joined him in this effort at the end of 2011, and both are helping to coordinate the reviews on contributed papers, as well. Their help is greatly appreciated.

Figure 2 shows the number of papers each Commission has contributed so far in the current triennium (through June 2014). We do not have promises for more. The response from the Commissions has been much lower than in recent triennia. Clearly, we need to somehow motivate the Commissions to provide more participation. Since each Commission was asked and had agreed to solicit two papers per year, we should have had close to 40 papers from the Commissions by now, instead of the eight we've received. This will be a topic of discussion at the GASS.

In the eleven issues of the RSB published through June in this triennium, we have had 33 papers. Of these, eight were contributed through the Commissions, three were from General Lectures or Tutorials, and 22 were papers not tied to a Commission. Most of these latter papers were invited, although there has been a recent increase in contributed papers.

The issues have basically been on schedule for the past three years, and I believe this will continue.

Inge Lievens continues to do an outstanding job of producing the RSB. Computer-to-plate processing using InDesign is going well. We have made some minor changes in

the format and style of the RSB, introducing color into the headings and changing some fonts to make portions more readable.

Kristian Schlegel continues to do a very good job with the book review column. We are averaging two book reviews per issue, and Kristian is getting good responses both from the publishers and potential reviewers. Kristian has started soliciting reviews from the Young Scientists from the last GASS, and we are averaging one such Young Scientist review per issue. However, Kristian has indicated that he wishes to retire from handling the general book reviews, so I will be seeking someone to take his place after the GASS. He will continue with the Young Scientist reviews.

Jim Lin has continued to regularly contribute a column on Radio Frequency Radiation Safety and Health. This is an important part of the RSB, both in terms of how well it has been received and because it provides welcome continuity.

The number of submissions to Peter Watson's column of abstracts of dissertations in radio science has fallen to zero. There just does not appear to be much interest in such a column.

Starting with the September 2013 issue, John Mathews has volunteered to act as Associate Editor for Historical Reviews. He will be soliciting review papers in this area. These seem to be popular papers, and we've had interest from potential authors in providing them.

The Web-based distribution of the RSB that started with the March 2009 issue continues to work very well. I not only have heard of no complaints regarding the switch to electronic delivery, but I continue to receive some positive feedback on the change.

As previously reported, in early 2012 I initiated the process of trying to get the RSB included in Thompson's Journal Citation Reports, which would result in the RSB having an impact factor. As I noted, this can take a substantial amount of time. I finally did hear back from Thompson on this, and the news was not good: they refused our request. However, they did encourage us to resubmit in another year or so, if our number of papers and citations continued to increase. Frankly, I was concerned that we were applying for this a bit too soon. We need to have a solid average of four to five papers per issue, and an average of several citations per paper per year, in order to be included in Journal Citation Reports. I'll monitor the situation, and reapply when I think we have a chance of being accepted.

2. Radio Science (Provided by Paul Cannon)

The report on the following pages on the URSI logo journal Radio Science, published by the American Geophysical Union (AGU), was provided by Paul Cannon, the Editor-in-Chief. His report is greatly appreciated. In it, he discusses the need for Radio Science to be made available through IEEE Xplore. I am a founding member and currently part of the IEEE TAB Periodicals Partnership Opportunities Committee. The purpose of this committee is to facilitate bringing non-IEEE periodicals onto Xplore. I've been working with the appropriate IEEE staff person involved, and had conversations with the AGU's Director of Publications, regarding trying to get Radio Science onto Xplore. Efforts on this are continuing. Hopefully, there may be some progress to report at the GASS.

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Radio Science Report
Paul Cannon, Editor-in-Chief
21 March 2014

Scope of Radio Science

The scope of Radio Science has been modified this year. We have sought to make the terms of reference (TOR) clearer and we have also explicitly stated that we will not accept "optical" papers, nor papers on "propagation in biological media". The new TORs are as follows Radio Science publishes original scientific contributions on radio-frequency electromagnetic propagation and its applications. Contributions covering measurement, modelling, prediction and forecasting techniques pertinent to fields and waves - including antennas, signals and systems, the terrestrial and space environment and radio propagation problems in radio astronomy - are welcome. Contributions may address propagation through, interaction with, and remote sensing of structures, geophysical media, plasmas, and materials, as well as the application of radio frequency electromagnetic techniques to remote sensing of the Earth and other bodies in the solar system.

The journal does not publish papers on propagation in biological media, nor optical phenomena. The journal does not publish papers on the geophysics of space plasmas which are better suited for publication in JGR: Space Physics.

The journal addresses most of the URSI Commissions, but there are restrictions. Notably, signal processing (for its own sake) and engineering papers (without any radio science) are best submitted to another journal.

Editorial Board

Paul Cannon serves as Editor-in-Chief. Joshua Le-Wei Li serves as Editor to deal with electromagnetic papers (URSI Commission B). There are around 15 Associate Editors.

Performance

Radio Science continues to attract a useful number of papers. The number of papers submitted in 2013 has recovered and looks as if it will be higher still in 2014 – largely due to papers associated with Special Sections. In round terms Commission B papers now account to around 25% of the papers, Commission G/H around 50% of the papers and the other URSI domains cover the final 25%.

The journal impact factor is 1.0 – way too low. The statistics for 2013 (so far) and a number of previous years can found at Table 1.

Standing

Radio Science remains (without doubt) a highly respected journal. Yet it often fails to attract the most novel papers; those with a bias towards the physics are submitted to more prestigious physics journals (including JGR-Space) while those with an engineering bias tend to be submitted to the IEEE journals.

Broad generalisations are dangerous, but good papers on the ionospheric radio science are generally submitted to Radio Science as a first choice journal. However, radio propagation papers related to the other domains tend to be preferentially submitted to other journals. Mobile communication, and fields and waves to name but two areas face very strong competition from the IEEE Transactions on Antenna and Propagations, IEEE Transactions on Instrumentation and IEEE Transactions on Geoscience and Remote Sensing and also from the IET Proceedings on Communications and the IET Proceedings on Microwave Antennas and Propagation. Other competitive journals are relevant to other technical domains.

Pricing and Fees

The above issues are exacerbated by the AGU funding model which derives most of its income from meeting registration, page charges and subscriptions (rather than membership dues).

Evolution of the field and journal coverage:

Taken in its entirety radio science has been and continues to be fundamental to modern society (eg GPS, cellular telephony and data, remote sensing). New topic areas such as cognitive radio, ionospheric data assimilation, measurements of the earth's biomass and metamaterials have emerged in recent years and no doubt others will continue to emerge. The breadth of Radio Science means that it is quite able to accommodate all of these developments. But as new technologies come along other journals are initiated by other societies. The ever increasing number of IEEE titles is testament to this. These new and specialised journals quickly become attractive to potential authors. The problem with a broad journal is that authors do not know what fits in the journal and what does not. With the exception of Nature, Science and GRL like journals, authors instead submit to more specialized journal like JGR or IEEE TGRS.

Recommendations

In a strategy review the Radio Science editorial board made the following recommendations (amongst others):

- The ToR of Radio Science needs to be revised (see above) to reduce the journals scope; implicit in this is rejection of papers outside of the new ToR.
- The new TORs need to recognise the external and internal competition. Rationalisation between Radio Science, Space Weather and JGR-Space is necessary as there is far too much overlap which confuses authors and readers alike.
- The co-sponsoring by URSI must be clarified and deepened. The intersection between URSI and AGU should be Radio Science's unique selling point – but at the moment it brings little benefit. URSI needs to explicitly value and support Radio Science.
- AGU should ask URSI to consider whether it could change the name of its publication – the Radio Science Bulletin - to one less easily confused with Radio Science. This will be to both journal's benefit.
- The cost model for Radio Science is not conducive to successfully competing with other journals. A cost differentiator is recommended.
- Radio Science needs to be made available through IEEEXplore. Without this we will take one step forward and two back.

Radio Science continues to be an anachronism at AGU!

For Period: 1/1/2009 - 12/31/2009

Report generated on October 10, 2010

RS Journal

Summary

Manuscript Types	Total # of Submitted Manuscripts	Acceptance Rate (%)	Total # of Accepted Manuscripts	Total # of Rejected Manuscripts	Total # of Pending Manuscripts	Days from Receipt to First Decision	Days from Receipt to Final Decision
Regular Article	118	57	65	50	3	84.2	160.74
Resubmission	6	60	3	2	1	51.83	80.8
Reply	1	0	0	1	0	55	134
Correction	1	100	1	0	0	1	1
Companion	1	0	0	0	1	46	0
Comment	1	0	0	1	0	99	178
Total	128	56	69	54	5	81.6	156.11

For Period: 1/1/2010 - 31/12/2010

Report generated on November 11, 2011

RS Journal

Summary

Manuscript Types	Total # of Submitted Manuscripts	Acceptance Rate (%)	Total # of Accepted Manuscripts	Total # of Rejected Manuscripts	Total # of Pending Manuscripts	Days from Receipt to First Decision	Days from Receipt to Final Decision
Regular Article	190	53	103	92	3	59.08	114.91
Resubmission	3	67	2	1	0	59.33	147.33
Correction	2	100	2	0	0	8	8
Total	203	54	107	93	3	58.58	114.33

Journal Summary Report**For Period: 1/1/2011 - 12/31/2011**

Report generated on August 30, 2012

RS Journal

Summary

Manuscript Types	Total # of Submitted Manuscripts	Acceptance Rate (%)	Total # of Accepted Manuscripts	Total # of Rejected Manuscripts	Total # of Pending Manuscripts	Days from Receipt to First Decision	Days from Receipt to Final Decision
Regular Article	231	63	145	85	1	60.47	123.39
Review	3	100	3	0	0	73	146.33
Correction	1	100	1	0	0	3	3
Comment	1	100	1	0	0	7	104
Total	236	64	150	85	1	60.16	123.09

Journal Summary Report**For Period: 1/1/2012 - 12/31/2012**

Report generated on March 24, 2013

RS Journal

Summary

Manuscript Types	Total # of Submitted Manuscripts	Acceptance Rate (%)	Total # of Accepted Manuscripts	Total # of Rejected Manuscripts	Total # of Pending Manuscripts	Days from Receipt to First Decision	Days from Receipt to Final Decision
Regular Article	120	45	45	56	19	61.3	100.45
Total	120	45	45	56	19	61.3	100.45

Journal Summary Report

For Period: 1/1/2013 - 12/31/2013

Report generated on March 21, 2014

RS Journal

Summary

Manuscript Types	Total # of Submitted Manuscripts	Acceptance Rate (%)	Total # of Accepted Manuscripts	Total # of Rejected Manuscripts	Total # of Pending Manuscripts	Days from Receipt to First Decision	Days from Receipt to Final Decision
Research Article	145	49	54	57	34	76.76	114.11
Review Article	2	0	0	0	2	50	0
Editor's Preface to a Special Collection	1	100	1	0	0	5	5
Total	148	49	55	57	36	76.05	113.13

URSI STANDING FINANCE COMMITTEE

Report and recommendations of the Standing Finance Committee, including approval of accounts 2011-2014

Prof. Paul Smith & Prof. Ayhan Altintas examined the report prepared by the Prof. P. Cannon (Treasurer) of the URSI Finances covering the period 2011-2014 and they noted that the accounts have been audited by Ernst & Young. On the basis of this information the report is found to be a fair and reasonable description of the URSI finances.

In addition some cost cutting issues are discussed with the President and Secretariat and considering that there will be more conferences, it seemed unlikely that cost-cutting measures would be possible. More conferences mean more secretarial support, more travel support and more YS support. On the income side, it appears that financially successful URSIGASS and AT-RASC are the key in trying to get more revenue for URSI. That is why it is suggested to take the financial aspects of URSI GASS and AT-RASC with extreme care.

Prof. A. Altintas & Prof. P. Smith
Beijing, China
URSI GASS 2014

URSI LONG RANGE PLANNING COMMITTEE

The Long Range Planning Committee (LRPC) for the triennium (August 2011- August 2014) has been organized by the following members consisting of past Commission Chairs, past Presidents, and some of the Board members invited by the chair of the LRPC.

S. Ananthakrishnan (Vice-President, Past Chair of Commission J)
M. Ando (Vice-President, Former Chair of Commission B)
P. Banerjee (Past Chair of Commission A)
P. Cannon (Vice-President, Past Chair of LRPC, Commission G)
M. Chandra (Past Chair of Commission F)
C. Christopoulos (Past Chair of Commission E)
G. D'Inzeo (Past Chair of Commission K)
F. Kaertner (Past Chair of Commission D)
P. Lagasse (Secretary General)
K. Langenberg (Past Chair of Commission B)
F. Lefeuvre (Past President, Commission H)
H. Matsumoto (Former President, Commission H)
T. Ohira (Past Chair of Commission C)
Y. Omura (Chair of LRPC, Past Chair of Commission H)
K. Schlegel (Former President, Commission G)
W. Stone (Editor of Radio Science Bulletin)
P. Wilkinson (President, Commission G)

1. Action Items identified at the GASS 2011

Based on the discussion at the first LRPC meeting at the GASS 2011, we presented the following “possible improvements” at the Council Meeting 4 held at the end of the GASS.

IA-1) Encourage participation of young scientists and students to Opening Ceremony by including a cultural program following the ceremony.

- IA-2) Utilize the online program book and abstracts by Free WIFI in all session rooms.
- IA-3) To improve quality of poster papers by young scientist, consider creation of “Commission Award for Excellent Poster Papers” to be awarded to students and young scientists (e.g. up to 5 years after Ph.D) .
- IA-4) To discourage “no show”, notify all authors in advance that unregistered papers are to be deleted from the final program and abstract books.
- IA-5) To hear voices of young scientists, conduct a survey of opinions about the young scientist program, opening ceremony, commission business meetings, etc.

2. LRPC Survey

To identify issues to be discussed and other possible improvements for future URSI GASS, we started to work on Action Item 5 by exchanging e-mails within the LRPC using the E-mail list: ursi_lrpc@ursi.org. Being free from the real tasks of managing the commission businesses, the past chairs could discuss the URSI matters effectively with broader and longer ranges of views based on their experience as vice-chairs and chairs of commissions. We have made a list of questions to be asked to the young scientists. With help of the URSI office, we have constructed an on-line survey system to collect opinions from the participants of the URSI GASS in Istanbul. The survey has been conducted for two time periods, August 2012 and February-March 2013.

The first announcement of the survey was made only to the Young Scientists (YS) of the URSI GASS in Istanbul to hear opinions from the YS and to possibly strengthen their association to URSI by sending each of them a letter from the URSI President requesting their participation in the survey. The second announcement was made to all participants. The results are summarized in the two documents attached to this report. In the first round of the survey for the YS, we obtained 39 responses, and 35 of them may be regarded as effective. In the second round of the survey for all participants, we obtained 261 responses, and 215 of them are effective. In the following we have extracted some of the results that should be useful for improving the future GASS.

The first and second percentages in brackets such as (ff.f%, ss.s%) indicate the rates of responses in the first and second rounds of the survey, respectively.

(1) Scientific Sessions

The Scientific Sessions were judged “Critically important for GASS” by (68.6%, 64.3%) in making decision to attend the GASS in Istanbul, and they were rated “Critically important for GASS” by (60.0%, 58.4%) after the GASS.

(2) Opening Ceremony

There were two dominant opinions:

Don't change the present Opening Ceremony format. (31.4%, 31.1%)

Add a cultural performance and shorten the Administrative Reports (31.4%, 28.3%)

- (3) Training workshops held prior to the GASS
(54.3 % , 44.7%) are not aware of them, though (65.7%, 54.8%) rate it “Useful”.
- (4) Papers included in IEEE Xplore
(51.4%, 25.5%) rate it “Critically important”,
(34.3%, 35.2%) rate it “Very important”,
and (11.4%, 24.1%) rate it “Useful”.
- (5) Indication of invited papers in the program book
(77.1 % , 75.9%) chose clear indication of invited papers in the program book.
- (6) List of Young Scientists
65.7 % of the YS want their “name+picture+biography” indicated on the URSI web site.
- (7) Student Paper Competition in Istanbul
(8.8%, 7.6%) rate it “Critically important for GASS”,
(64.7 % , 35.9%) rate it “Very important”,
and (11.8 % , 44.3%) rate it “Useful”.
- (8) Introduction of “Commission awards” for excellent poster papers
(23.5%, 8.0%) rate it “Critically important for GASS”
(41.2 % , 35.9%) rate it “Very important”,
and (29.4 % , 44.3 %) rate it “Useful”.
- (9) Local URSI Member Committee
(46.2 % , 24.7%) were not aware that there is a local URSI Member Committee.

3. Proposed Action Items

Based on the results of the survey, we proposed the following action items to be discussed at the Board and Coordinating Committee.

- PIA-1) It is very important to consider how to maximize the value flowing from the Scientific Sessions at the forthcoming GASS.
- PIA-2) Arrangement of possible cultural programs should be made to encourage participation of young scientists and students to the Opening Ceremony.
- PIA-3) The training workshops held prior to the GASS need to be announced clearly so that more people should be aware of them.
- PIA-4) Since more than 75% of the participants chose clear indication of invited paper in the program book, the current policy not to indicate invited papers should be reconsidered.
- PIA-5) Announcement of the YS with their name + picture +biography on the URSI web site should be considered.
- PIA-6) The majority of the participants (nearly 90%) including the YS think it useful or important to introduce “Commission awards” for excellent poster papers. It should be discussed how to implement the awards at the GASS in Beijing.

4. Comments on “Guidelines for Commission Chairs and Vice Chairs and Early Career Representatives”

The LRPC reviewed a draft of “Guidelines for Commission Chairs and Vice Chairs and Early Career Representatives,” which had been prepared by the Board. Some of the new ideas and changes described in the document originate from the results of the LRPC Survey. The LRPC comments submitted to the Board on 31 December 2013 are attached below.

Comments on “Guidelines for Commission Chairs and Vice Chairs and Early Career Representatives”

URSI Long Range Planning Committee

The guidelines define the roles of Commission Chairs and Vice Chairs and newly introduced Early Career Representatives in details. The document is one of the most important references for the URSI officials to work for proper managements and enhancement of URSI meetings and publications. The current version of the document is generally well-written except for the following minor points.

[1] Page 3, Item 5: Explain the abbreviations:

AT-RASC (Atlantic Radio Science Conference)

AP-RASC (Asia-Pacific Radio Science Conference)

[2] Page 3, Items 3 and 7: The roles and responsibilities of ECR should be stated completely.

What is missing is the following statement written in “Guidelines Commission Chairs regarding the Early Career Representatives” (Version 20 Dec. 2013)

“At the discretion of the Commission Chair, become an Associate Editor of RSB, in addition to the regular Associate Editor appointed by the Commission.

In this position, he/she will be required to solicit the submission of at least two papers per year for the RSB, and help to coordinate reviews of papers in the field of the Commission when requested.”

[3] Page 3, Item 12: “The Chair is responsible for finding three or more able candidates”, which is not consistent with “Selection of short list” in the election procedures explained in the guidelines. The phrase “three or more” should be replaced by “at least two, but not more than four, ”

[4] Page 3, after Item 13: Consider adding the following statement to facilitate response from Commission Chairs.

“The Chair is responsible for regularly reading emails and responding in due time if URSI matters are addressed.”

[5] Page 5, “Radio Science Bulletin (RSB)”: The RSB Assoc. Editor on Book Reviews would like to add the following statement.

“The Chairs should inform the RSB Assoc. Editor on Book Reviews about new books published in the field of the respective Commission and help him to find reviewer for these books.” (or a similar formulation)

Some thought to how ECRs are to be elected

Introduction of Early Carrier Representatives is a good idea for enhancing the URSI activities involving the younger generation. ECRs should have experiences of the URSI activities as much as possible so that they can conceive of possible improvements of them. In this respects Young Scientists and/or participants in the student competition would be good candidates. If they have experiences as conveners of sessions at GASS and other scientific meetings, this would surely enhance their capacity as ECRs.

5. Comments for future URSI GASS

Observing the current situation (as of 23 June 2014) of the Website for the 31st GASS in Beijing, we find the information content is not enough with respect to the following items.

- Programs: Only a table of session overview is provided. No detailed program indicating paper titles and authors in sessions is available.
- Speakers: No information on general lectures and tutorial lectures is provided, while tutorial lectures are announced in the URSI home page. There is no obvious link to the URSI home page.
- Conference Guide: No detailed information on public transportation such as timetables, fares, and how to buy tickets is available.
- Short courses / Workshops: Although the time slots are indicated in the session timetable, no information about the short courses or workshops is available.
- Young Scientist Awards: Only rules are listed. No update or result of the Awards is announced, while the awardees have been announced in the URSI home page.
- Student Paper Competition: Only rules are listed. No final program of the competition is announced.

Some of the problems raised above are related to the issues that have already been recognized as the proposed actions items described in this report. The proposed action items were first reported to the Board meeting in April 2013, and they have been discussed in the Board. Although some of the action items have been implemented in the revised guidelines of commission officers, the commission officers and the LOC members should be proactively sensitized to the proposed action items and related issues. The LRPC recommends the Board to make additional efforts for implementing the proposed action items, especially for better management of the website of future URSI GASS.

Results for: URSI - Questionnaire for Participants of the XXXth URSI GASS - version 12-08-02










1) In what capacity did you attend the Istanbul GASS: (Young Scientist / Council Member / Session convener / Commission National Delegate / Presenter / Attendee)

(Check ALL that apply)

		Percentage	Responses
Young Scientist		58.7	37
Council Member		0.0	0
Session convener		0.0	0
Commission Official Member (National Delegate)		0.0	0
Presenter		28.6	18
Attendee		12.7	8

2) Which URSI Commission best meets your needs?

(Choose ONE of the following)

		Percentage	Responses
Commission A: Electromagnetic Metrology		0.0	0
Commission B: Fields and waves		30.8	12
Commission C: Radiocommunication and Signal Processing Systems		2.6	1
Commission D: Electronics and Photonics		15.4	6
Commission E: Electromagnetic Environment and Interference		7.7	3
Commission F: Wave Propagation and Remote Sensing		12.8	5
Commission G: Ionospheric Radio and Propagation		5.1	2
Commission H: Waves in Plasmas		5.1	2
Commission J: Radio Astronomy		12.8	5
Commission K: Electromagnetics in Biology and Medicine		7.7	3
Total responses:			39

3) Did you attend previous GASS?

	As Young Scientist	As regular participant	Not attended	Responses	Average Score
2011 Istanbul, Turkey	31 (79.49%)	3 (7.69%)	5 (12.82%)	39	1.33 / 3 (44.33%)
2008 Chicago, USA	2 (5.13%)	2 (5.13%)	35 (89.74%)	39	2.85 / 3 (95.00%)
2005 New Delhi, India	1 (2.56%)	3 (7.69%)	35 (89.74%)	39	2.87 / 3 (95.67%)
2002 Maastricht, The Netherlands	0 (0.00%)	0 (0.00%)	39 (100.00%)	39	3.00 / 3 (100.00%)
1999 Toronto, Canada	0 (0.00%)	0 (0.00%)	39 (100.00%)	39	3.00 / 3 (100.00%)

1996 Lille, France	0 (0.00%)	0 (0.00%)	39 (100.00%)	39	3.00 / 3 (100.00%)
prior to 1996	0 (0.00%)	0 (0.00%)	39 (100.00%)	39	3.00 / 3 (100.00%)
					2.72 / 3 (90.71%)

- 4) What influenced your decision to attend the GASS in Istanbul?
We would like to know how important each of the following aspects of the URSI GASS programme was in making your decision to attend. In the next question we will ask you how your expectations were met.

	Better dropped from GASS	Uninteresting	Useful	Very important	Critically important for GASS	Responses	Average Score
Opening & Award Ceremony	1 (2.86%)	5 (14.29%)	18 (51.43%)	8 (22.86%)	3 (8.57%)	35	3.20 / 5 (64.00%)
Scientific Sessions	0 (0.00%)	0 (0.00%)	2 (5.71%)	9 (25.71%)	24 (68.57%)	35	4.63 / 5 (92.60%)
Poster Sessions	1 (2.86%)	0 (0.00%)	5 (14.29%)	16 (45.71%)	13 (37.14%)	35	4.14 / 5 (82.80%)
Public Lecture	0 (0.00%)	2 (5.71%)	13 (37.14%)	16 (45.71%)	4 (11.43%)	35	3.63 / 5 (72.60%)
General Lectures	0 (0.00%)	1 (2.86%)	11 (31.43%)	18 (51.43%)	5 (14.29%)	35	3.77 / 5 (75.40%)
Tutorials	0 (0.00%)	4 (11.43%)	16 (45.71%)	12 (34.29%)	3 (8.57%)	35	3.40 / 5 (68.00%)
Social Program	2 (5.71%)	3 (8.57%)	18 (51.43%)	9 (25.71%)	3 (8.57%)	35	3.23 / 5 (64.60%)
Young Scientist Program	1 (2.86%)	0 (0.00%)	2 (5.71%)	12 (34.29%)	20 (57.14%)	35	4.43 / 5 (88.60%)
Networking with colleagues	0 (0.00%)	0 (0.00%)	8 (22.86%)	13 (37.14%)	14 (40.00%)	35	4.17 / 5 (83.40%)
Istanbul as venue	0 (0.00%)	1 (2.86%)	18 (51.43%)	12 (34.29%)	4 (11.43%)	35	3.54 / 5 (70.80%)
							3.81 / 5 (76.28%)

- 5) In the previous question you indicated how important the different aspects were for you to decide to attend the URSI GASS.
Having attended the URSI GASS in Istanbul and thinking back at the event, how do you rate the following?

	Not Applicable/Not attended	Better dropped from GASS	Uninteresting	Useful	Very important	Critically important for GASS	Responses	Average Score
Young Scientist Program	0 (0.00%)	1 (2.86%)	3 (8.57%)	5 (14.29%)	15 (42.86%)	11 (31.43%)	35	4.42 / 5 (88.40%)
Young Scientist Party	0 (0.00%)	1 (2.86%)	5 (14.29%)	12 (34.29%)	12 (34.29%)	5 (14.29%)	35	4.17 / 5 (83.40%)
Welcome Reception	4 (11.43%)	1 (2.86%)	5 (14.29%)	13 (37.14%)	10 (28.57%)	2 (5.71%)	35	3.73 / 5 (74.60%)
Conference Banquet	9 (25.71%)	2 (5.71%)	4 (11.43%)	14 (40.00%)	5 (14.29%)	1 (2.86%)	35	3.12 / 5 (62.40%)

Opening & Awards Ceremony	4 (11.43%)	2 (5.71%)	3 (8.57%)	15 (42.86%)	9 (25.71%)	2 (5.71%)	35	3.70 / 5 (74.00%)
Scientific Sessions	0 (0.00%)	0 (0.00%)	0 (0.00%)	3 (8.57%)	11 (31.43%)	21 (60.00%)	35	4.79 / 5 (95.80%)
Poster Sessions	0 (0.00%)	0 (0.00%)	1 (2.86%)	7 (20.00%)	15 (42.86%)	12 (34.29%)	35	4.61 / 5 (92.20%)
Public Lecture	5 (14.29%)	0 (0.00%)	3 (8.57%)	9 (25.71%)	10 (28.57%)	8 (22.86%)	35	3.70 / 5 (74.00%)
General Lectures	2 (5.71%)	0 (0.00%)	3 (8.57%)	8 (22.86%)	14 (40.00%)	8 (22.86%)	35	4.19 / 5 (83.80%)
Tutorials	8 (22.86%)	0 (0.00%)	6 (17.14%)	12 (34.29%)	6 (17.14%)	3 (8.57%)	35	3.25 / 5 (65.00%)
Closing Ceremony	8 (22.86%)	1 (2.86%)	7 (20.00%)	12 (34.29%)	6 (17.14%)	1 (2.86%)	35	3.21 / 5 (64.20%)
Commission Business Meetings	11 (31.43%)	0 (0.00%)	3 (8.57%)	14 (40.00%)	5 (14.29%)	2 (5.71%)	35	3.06 / 5 (61.20%)
								3.73 / 5 (74.58%)

- 6) The Opening and Award Ceremony is an important part of the program of the URSI GASS and consists of several parts:

Welcome addresses, report from the URSI Secretary General, Awards Ceremony.

How would you rate the current format of the Opening Ceremony?

	Not Applicable/ Did not attend	Extremely boring	Not attractive	Neutral	Attractive	Very attractive	Responses	Average Score
Opening Ceremony	6 (17.14%)	0 (0.00%)	2 (5.71%)	13 (37.14%)	11 (31.43%)	3 (8.57%)	35	3.72 / 5 (74.40%)
								3.72 / 5 (74.40%)

- 7) To make the Opening Ceremony more interesting, a cultural performance may be added. What is your opinion on this?

(Choose ONE of the following)

	Percentage	Responses
Don't change the present Opening Ceremony format.	31.4	11
Add a cultural performance and have a longer Opening Ceremony	17.1	6
Add a cultural performance and shorten the Welcome Address	5.7	2
Add a cultural performance and shorten the Administrative Reports	31.4	11
Add a cultural performance and shorten the Award Ceremony	5.7	2
Other	8.6	3
Total responses:		35

8) Are you aware that there are training workshops held prior to the GASS?

		Percentage	Responses
Yes		45.7	16
No		54.3	19
Total responses:			35

9) How important are accompanying training workshops or courses to you?

	Better dropped from GASS	Uninteresting	Useful	Very important	Critically important for GASS	Responses	Average Score
Accompanying training workshops or courses	1 (2.86%)	7 (20.00%)	23 (65.71%)	3 (8.57%)	1 (2.86%)	35	2.89 / 5 (57.80%) 2.89 / 5 (57.80%)

10) What type of courses would be of most value?

(The last five responses are given)

- Software and hardware application in telecommunication including wave propagation and electromagnetic
- Specialized Hands-on training courses. Emphasis may be laid on latest techniques.
- HPEM, Measurements in time domain
- electronics
- application based

11) When you attended the GASS in Istanbul, from which Commissions did you attend sessions?

(Check all that apply)

		Percentage	Responses
Commission A: Electromagnetic Metrology		2.5	2
Commission B: Fields and waves		22.8	18
Commission C: Radiocommunication and Signal Processing Systems		8.9	7
Commission D: Electronics and Photonics		6.3	5
Commission E: Electromagnetic Environment and Interference		8.9	7
Commission F: Wave Propagation and Remote Sensing		19.0	15
Commission G: Ionospheric Radio and Propagation		8.9	7
Commission H: Waves in Plasmas		5.1	4
Commission J: Radio Astronomy		6.3	5
Commission K: Electromagnetics in Biology and Medicine		11.4	9

12) How important was it that the papers were included in IEEE Xplore?

	Not Applicable	Of no use	Uninteresting	Useful	Very important	Critical important	Responses	Average Score
Papers included in IEEE Xplore	0 (0.00%)	0 (0.00%)	1 (2.86%)	4 (11.43%)	12 (34.29%)	18 (51.43%)	35	4.65 / 5 (93.00%)
								4.65 / 5 (93.00%)

- 13) In the XXXth URSI GASS program book there was no indication which papers were invited papers. Should URSI continue with this style?

(Choose ONE of the following)

	Percentage	Responses
Invited papers should NOT be identified in the Program book	22.9	8
Invited papers should be CLEARLY identified in the Program book as "Invited"	77.1	27
Total responses:		35

- 14) Here you can add some comments on all the different aspects of the GASS. Comments can cover Opening Ceremony, Award Session, scientific programme, poster sessions, proceedings, facilities, accommodations, catering, social programme, etc...
- We welcome your feedback and will consider all suggestions to improve the next GASS in Beijing.

(The last five responses are given)

- Increase the number of YS that follow the GASS
- The Young Scientists Programme should be more involved. Arrangement of a separate function for the Young Scientists Award (YSA) recipients (apart from the party) like the Awardees in the opening ceremony would be an excellent idea. It will be ideal to present the YSA certificates & mementos during that function. The scientific programme can be more involved. Further sub-sessions may be clubbed together to avoid less attendance in certain sessions.
- I was a YS at the GAAS and I was very disappointed about the reception and accommodation. At the reception of the conference, people were really rude and they never try to help us. The accommodation were totally disrespectful. This was my first GASS and I have a really bad memory of it. I think I am not the only one in that case. YS and student in general are the future of the research. What example researcher gave when they are in five stars hostel whereas YS and student are in a dormitory? I hope it will be corrected in Beijing.
- Accommodation was offered to young scientists in the Students Dormitory at Istanbul. The conditions were not the best. We were placed in a girls dormitory and they were not happy to have us there disturbing their vacation.
- Please arrange proper Lunch and Dinner during GASS

- 15) Will you attend the next URSI GASS in Beijing (2014)?

	Percentage	Responses
Yes	22.9	8
No	5.7	2
I do not know yet	71.4	25
Total responses:		35

- 16) If you were a Young Scientist at the URSI GASS, would you like to have your name, picture and short biography listed as one of the Young Scientists on the URSI Web site? We see this as a way to increase the visibility of the Young Scientist Program and of the URSI Young Scientist Award Winners.

(Choose ONE of the following)

		Percentage	Responses
Name only		17.1	6
Name + picture		17.1	6
Name + picture + biography		65.7	23
I was not a Young Scientist		0.0	0
		Total responses:	35

17) How can we improve communications between Young Scientists and other members of URST?

	Of no use	Uninteresting	Useful	Very important	Critical important	Responses	Average Score
through a YS section in the newsletters	1 (2.86%)	4 (11.43%)	17 (48.57%)	12 (34.29%)	1 (2.86%)	35	3.23 / 5 (64.60%)
through a YS section on the website	1 (2.86%)	3 (8.57%)	8 (22.86%)	15 (42.86%)	8 (22.86%)	35	3.74 / 5 (74.80%)
through a YS section in the Radio Science Bulletin	1 (2.86%)	1 (2.86%)	17 (48.57%)	12 (34.29%)	4 (11.43%)	35	3.49 / 5 (69.80%)
through support of Student Paper Competitions	0 (0.00%)	0 (0.00%)	8 (22.86%)	22 (62.86%)	5 (14.29%)	35	3.91 / 5 (78.20%)
through a YS Committee to offer the Board and Council suggestions on developing YS programs	0 (0.00%)	2 (5.71%)	9 (25.71%)	17 (48.57%)	7 (20.00%)	35	3.83 / 5 (76.60%)
through YS sections in each Commission	2 (5.71%)	5 (14.29%)	6 (17.14%)	15 (42.86%)	7 (20.00%)	35	3.57 / 5 (71.40%)
							3.63 / 5 (72.57%)

18) Have you any other suggestions to make to improve the Young Scientist Program?

(The last five responses are given)

- Everything was very good! Thank you very much for developing country support! But it will be better if accommodation are provided till the day of closing ceremony.
- Increase the number of YS and invite YS from many countries
- Please refer to my suggestions provided earlier. An important aspect would be to make the YSA recipients feel the importance of the same through an exclusive program during the GASS. It may be combined with the opening ceremony or with the valedictory function. Additionally, it will be encouraging to bring out a special publication of the YSA recipients work as full papers in a URST bound volume or a special volume in Advances in Radio Science. Request the secretariat to consider the above two critically.
- No
- More interaction required among YS of different country so more stress may be given on YS formal party + their presentation + Future work+plan discussion etc

19) At the GASS in Istanbul a Student Paper Competition was held. How do you value this?

	I was not aware of this	Better dropped from GASS	Uninteresting	Useful	Very important	Critically important for GASS	Responses	Average Score
Student Paper Competition	3 (8.82%)	2 (5.88%)	0 (0.00%)	4 (11.76%)	22 (64.71%)	3 (8.82%)	34	4.29 / 5 (85.80%)
								4.29 / 5 (85.80%)

20) How would you rate the introduction of "Commission awards" for excellent poster papers for students and young scientists. This is considered as a possible method for enhancing the visibility of the poster sessions.

	Better dropped from GASS	Uninteresting	Useful	Very important	Critically important for GASS	Responses	Average Score
Commission Student Poster Awards	0 (0.00%)	2 (5.88%)	10 (29.41%)	14 (41.18%)	8 (23.53%)	34	3.82 / 5 (76.40%)
							3.82 / 5 (76.40%)

21) How would you like to see the selection process for the Student Poster Awards to be introduced?

(Choose ONE of the following)

	Percentage	Responses
One Poster Award per Commission	47.1	16
Selection based on the scoring by Programme Committee	17.6	6
Selection based on Poster presentation	26.5	9
I would not like a Poster Award to be introduced	8.8	3
Total responses:		34

22) URSI Member Committees are present in many regions. Is there any way you are linked with this national committee in your region?

(Check ALL that apply)

	Percentage	Responses
I have an active role in the local URSI Member Committee	2.6	1
I attend meetings of the local URSI member Committee	7.7	3
I attend symposia/workshops organised by the local URSI Member Committee	25.6	10
I was not aware that there is a local URSI Member Committee	46.2	18
There is no URSI Member Committee in my region	17.9	7

23) Have you had the opportunity to participate in URSI activities within your country/region? Can you provide comments on how you participated in your country's URSI activities?

	Percentage	Responses
Yes	15.2	5
No	75.8	25
Other	9.1	3
Total responses:		33

24) What did you think of communications between your Commission and URSI, the Local Organizing Committee of the XXXth URSI GASS, and the URSI Office?

(The last five responses are given)

- Very good
- It was excellent and really helpful.
- Not any comment
- Good
- too limited

25) What social media do you currently use?

(Check ALL that apply)

		Percentage	Responses
None		25.0	10
Facebook		42.5	17
LinkedIn		22.5	9
Twitter		2.5	1
Other		7.5	3

26) If URSI had a social media presence, would you make use of it?

(Choose ONE of the following)

		Percentage	Responses
Definitely		42.4	14
Probably		33.3	11
I am not sure		21.2	7
Probably not		0.0	0
Definitely not		3.0	1
		Total responses:	33

27) Thank you for your assistance.







If you are willing to be contacted again regarding changes and improvements related to URSI, please provide your contact details here.
This information will be collected by the URSI Secretariat and will not be forwarded to any other organisation or body.

1. Family Name:
2. Given name:
3. e-mail:
4. Institute:
5. Address Line 1:
6. Address Line 2:
7. City:
8. State:
9. ZIP Code:
10. Country:

Results for: URSI - Questionnaire for Participants of the XXXth URSI GASS - version 12-08-02 13-03-22











1) In what capacity did you attend the Istanbul GASS: (Young Scientist / Council Member / Session convener / Commission National Delegate / Presenter / Attendee)

(Check ALL that apply)

		Percentage	Responses
Young Scientist		21.2	87
Council Member		2.7	11
Session convener		7.5	31
Commission Official Member (National Delegate)		9.7	40
Presenter		38.9	160
Attendee		20.0	82

2) Which URSI Commission best meets your needs?

(Choose ONE of the following)

		Percentage	Responses
Commission A: Electromagnetic Metrology		2.7	7
Commission B: Fields and waves		26.4	69
Commission C: Radiocommunication and Signal Processing Systems		5.4	14
Commission D: Electronics and Photonics		7.3	19
Commission E: Electromagnetic Environment and Interference		8.4	22
Commission F: Wave Propagation and Remote Sensing		11.5	30
Commission G: Ionospheric Radio and Propagation		9.6	25
Commission H: Waves in Plasmas		10.7	28
Commission J: Radio Astronomy		12.6	33
Commission K: Electromagnetics in Biology and Medicine		5.4	14
		Total responses:	261

3) Did you attend previous GASS?

	As Young Scientist	As regular participant	Not attended	Responses	Average Score
2011 Istanbul, Turkey	71 (27.20%)	157 (60.15%)	33 (12.64%)	261	1.85 / 3 (61.67%)
2008 Chicago, USA	10 (3.83%)	87 (33.33%)	164 (62.84%)	261	2.59 / 3 (86.33%)
2005 New Dehli, India	8 (3.07%)	82 (31.42%)	171 (65.52%)	261	2.62 / 3 (87.33%)
2002 Maastricht, The Netherlands	4 (1.54%)	59 (22.78%)	196 (75.68%)	259	2.74 / 3 (91.33%)
1999 Toronto, Canada	5 (1.93%)	58 (22.39%)	196 (75.68%)	259	2.74 / 3 (91.33%)
1996 Lille, France	2 (0.77%)	48 (18.53%)	209 (80.69%)	259	2.80 / 3 (93.33%)
prior to 1996	3 (1.15%)	55 (21.07%)	203 (77.78%)	261	2.77 / 3 (92.33%)
					2.59 / 3 (86.22%)

- 4) What influenced your decision to attend the GASS in Istanbul?
We would like to know how important each of the following aspects of the URSI GASS programme was in making your decision to attend. In the next question we will ask you how your expectations were met.

	Better dropped from GASS	Uninteresting	Useful	Very important	Critically important for GASS	Responses	Average Score
Opening & Award Ceremony	7 (3.17%)	53 (23.98%)	104 (47.06%)	40 (18.10%)	17 (7.69%)	221	3.03 / 5 (60.60%)
Scientific Sessions	2 (0.90%)	2 (0.90%)	15 (6.79%)	60 (27.15%)	142 (64.25%)	221	4.53 / 5 (90.60%)
Poster Sessions	4 (1.81%)	5 (2.26%)	44 (19.91%)	89 (40.27%)	79 (35.75%)	221	4.06 / 5 (81.20%)
Public Lecture	2 (0.90%)	12 (5.43%)	84 (38.01%)	90 (40.72%)	33 (14.93%)	221	3.63 / 5 (72.60%)
General Lectures	3 (1.36%)	7 (3.17%)	75 (33.94%)	95 (42.99%)	41 (18.55%)	221	3.74 / 5 (74.80%)
Tutorials	4 (1.81%)	20 (9.05%)	99 (44.80%)	76 (34.39%)	22 (9.95%)	221	3.42 / 5 (68.40%)
Social Program	7 (3.17%)	49 (22.17%)	95 (42.99%)	52 (23.53%)	18 (8.14%)	221	3.11 / 5 (62.20%)
Young Scientist Program	4 (1.81%)	23 (10.41%)	48 (21.72%)	79 (35.75%)	67 (30.32%)	221	3.82 / 5 (76.40%)
Networking with colleagues	2 (0.90%)	2 (0.90%)	34 (15.38%)	99 (44.80%)	84 (38.01%)	221	4.18 / 5 (83.60%)
Istanbul as venue	6 (2.71%)	17 (7.69%)	106 (47.96%)	67 (30.32%)	25 (11.31%)	221	3.40 / 5 (68.00%)
							3.69 / 5 (73.84%)

- 5) In the previous question you indicated how important the different aspects were for you to decide to attend the URSI GASS. Having attended the URSI GASS in Istanbul and thinking back at the event, how do you rate the following?

	Not Applicable/Not attended	Better dropped from GASS	Uninteresting	Useful	Very important	Critically important for GASS	Responses	Average Score
Young Scientist Program	70 (31.67%)	4 (1.81%)	11 (4.98%)	40 (18.10%)	56 (25.34%)	40 (18.10%)	221	3.04 / 5 (60.80%)
Young Scientist Party	93 (42.08%)	8 (3.62%)	20 (9.05%)	52 (23.53%)	33 (14.93%)	15 (6.79%)	221	2.63 / 5 (52.60%)
Welcome Reception	38 (17.19%)	4 (1.81%)	19 (8.60%)	78 (35.29%)	70 (31.67%)	12 (5.43%)	221	3.66 / 5 (73.20%)
Conference Banquet	57 (25.79%)	7 (3.17%)	19 (8.60%)	77 (34.84%)	52 (23.53%)	9 (4.07%)	221	3.28 / 5 (65.60%)
Opening & Awards Ceremony	40 (18.10%)	6 (2.71%)	27 (12.22%)	87 (39.37%)	48 (21.72%)	13 (5.88%)	221	3.47 / 5 (69.40%)
Scientific Sessions	3 (1.36%)	1 (0.45%)	0 (0.00%)	22 (9.95%)	66 (29.86%)	129 (58.37%)	221	4.60 / 5 (92.00%)
Poster Sessions	4 (1.81%)	2 (0.90%)	8 (3.62%)	48 (21.72%)	88 (39.82%)	71 (32.13%)	221	4.43 / 5 (88.60%)
Public Lecture	32 (14.48%)	1 (0.45%)	15 (6.79%)	67 (30.32%)	76 (34.39%)	30 (13.57%)	221	3.81 / 5 (76.20%)
General Lectures	18 (8.14%)	1 (0.45%)	8 (3.62%)	72 (32.58%)	88 (39.82%)	34 (15.38%)	221	4.13 / 5 (82.60%)
Tutorials	54 (24.43%)	2 (0.90%)	15 (6.79%)	68 (30.77%)	60 (27.15%)	22 (9.95%)	221	3.39 / 5 (67.80%)

Closing Ceremony	65 (29.41%)	5 (2.26%)	42 (19.00%)	78 (35.29%)	25 (11.31%)	6 (2.71%)	221	2.97 / 5 (59.40%)
Commission Business Meetings	65 (29.41%)	2 (0.90%)	18 (8.14%)	59 (26.70%)	47 (21.27%)	30 (13.57%)	221	3.11 / 5 (62.20%)
								3.47 / 5 (69.33%)

- 6) The Opening and Award Ceremony is an important part of the program of the URSI GASS and consists of several parts:
Welcome addresses, report from the URSI Secretary General, Awards Ceremony.
How would you rate the current format of the Opening Ceremony?

	Not Applicable/Did not attend	Extremely boring	Not attractive	Neutral	Attractive	Very attractive	Responses	Average Score
Opening Ceremony	49 (22.37%)	8 (3.65%)	16 (7.31%)	76 (34.70%)	61 (27.85%)	9 (4.11%)	219	3.44 / 5 (68.80%)
								3.44 / 5 (68.80%)

- 7) To make the Opening Ceremony more interesting, a cultural performance may be added. What is your opinion on this?

(Choose ONE of the following)

	Percentage	Responses
Don't change the present Opening Ceremony format.	31.1	68
Add a cultural performance and have a longer Opening Ceremony	11.9	26
Add a cultural performance and shorten the Welcome Address	12.8	28
Add a cultural performance and shorten the Administrative Reports	28.3	62
Add a cultural performance and shorten the Award Ceremony	7.3	16
Other	8.7	19
Total responses:		219

- 8) Are you aware that there are training workshops held prior to the GASS?

	Percentage	Responses
Yes	55.3	120
No	44.7	97
Total responses:		217

- 9) How important are accompanying training workshops or courses to you?

	Better dropped from GASS	Uninteresting	Useful	Very important	Critically important for GASS	Responses	Average Score
Accompanying training workshops or courses	9 (4.15%)	64 (29.49%)	119 (54.84%)	19 (8.76%)	6 (2.76%)	217	2.76 / 5 (55.20%)
							2.76 / 5 (55.20%)

- 10) What type of courses would be of most value?

(The last five responses are given)

- Courses giving a strong theoretical background on emerging topics
- Translation to industry
- practical applications and know-how that is useful for industry
- workshop space weather, ionosphere, GNSS
- On topics relating to state-of-the-art developments: Example (for commission-F) MIMO- Radars, Propagation in Metmaterials, etc

11) When you attended the GASS in Istanbul, from which Commissions did you attend sessions?

(Check all that apply)

		Percentage	Responses
Commission A: Electromagnetic Metrology		5.8	32
Commission B: Fields and waves		17.5	96
Commission C: Radiocommunication and Signal Processing Systems		10.0	55
Commission D: Electronics and Photonics		6.6	36
Commission E: Electromagnetic Environment and Interference		9.3	51
Commission F: Wave Propagation and Remote Sensing		13.7	75
Commission G: Ionospheric Radio and Propagation		10.0	55
Commission H: Waves in Plasmas		8.6	47
Commission J: Radio Astronomy		10.2	56
Commission K: Electromagnetics in Biology and Medicine		8.4	46

12) How important was it that the papers were included in IEEE Xplore?

	Not Applicable	Of no use	Uninteresting	Useful	Very important	Critical important	Responses	Average Score
Papers included in IEEE Xplore	6 (2.78%)	11 (5.09%)	16 (7.41%)	52 (24.07%)	76 (35.19%)	55 (25.46%)	216	4.12 / 5 (82.40%)
								4.12 / 5 (82.40%)

13) In the XXXth URSI GASS program book there was no indication which papers were invited papers. Should URSI continue with this style?

(Choose ONE of the following)

		Percentage	Responses
Invited papers should NOT be identified in the Program book		24.1	52
Invited papers should be CLEARLY identified in the Program book as "Invited"		75.9	164
Total responses:			216

14) Here you can add some comments on all the different aspects of the GASS. Comments can cover Opening Ceremony, Award Session, scientific programme, poster sessions, proceedings, facilities, accommodations, catering, social programme, etc... We welcome your feedback and will consider all suggestions to improve the next GASS in Beijing.

(The last five responses are given)



- Long admin sessions in an interesting city do not go together!
- The quality of some presentations is not very high.
- During the voting on council items there was an attempt to hold council business between votes. This was very distracting.
- there is lunch and dinner also there is social program for facilitator all scientist from different country.
- The Business meetings were held at the same time as the scientific sessions. The two activities led to a conflict of interest.

15) Will you attend the next URSI GASS in Beijing (2014)?

		Percentage	Responses
Yes		35.3	76
No		12.1	26
I do not know yet		52.6	113
		Total responses:	215

16) If you were a Young Scientist at the URSI GASS, would you like to have your name, picture and short biography listed as one of the Young Scientists on the URSI Web site?
We see this as a way to increase the visibility of the Young Scientist Program and of the URSI Young Scientist Award Winners.

(Choose ONE of the following)

		Percentage	Responses
Name only		9.8	21
Name + picture		6.0	13
Name + picture + biography		30.2	65
I was not a Young Scientist		54.0	116
		Total responses:	215

17) How can we improve communications between Young Scientists and other members of URSI?

	Of no use	Uninteresting	Useful	Very important	Critical important	Responses	Average Score
through a YS section in the newsletters	20 (9.39%)	25 (11.74%)	117 (54.93%)	43 (20.19%)	8 (3.76%)	213	2.97 / 5 (59.40%)
through a YS section on the website	12 (5.63%)	13 (6.10%)	106 (49.77%)	63 (29.58%)	19 (8.92%)	213	3.30 / 5 (66.00%)
through a YS section in the Radio Science Bulletin	16 (7.51%)	25 (11.74%)	103 (48.36%)	57 (26.76%)	12 (5.63%)	213	3.11 / 5 (62.20%)
through support of Student Paper Competitions	13 (6.10%)	11 (5.16%)	86 (40.38%)	80 (37.56%)	23 (10.80%)	213	3.42 / 5 (68.40%)
through a YS Committee to offer the Board and Council suggestions on developing YS programs	11 (5.16%)	24 (11.27%)	97 (45.54%)	60 (28.17%)	21 (9.86%)	213	3.26 / 5 (65.20%)
through YS sections in each Commission	22 (10.33%)	22 (10.33%)	92 (43.19%)	57 (26.76%)	20 (9.39%)	213	3.15 / 5 (63.00%)
							3.20 / 5 (64.03%)

18) Have you any other suggestions to make to improve the Young Scientist Program?

(The last five responses are given)

- provide more support to scientist working in the industry
- there is website or mailing list for YS program also there is International journal, international workshop or international seminar based on each commission for YS.
- Young engineers/scientists should be able to become 'URSI-members' by paying a subscription, very much as the IEEE.
- Not at this time.
- Better standard of accommodation.

19) At the GASS in Istanbul a Student Paper Competition was held. How do you value this?

	I was not aware of this	Better dropped from GASS	Uninteresting	Useful	Very important	Critically important for GASS	Responses	Average Score
Student Paper Competition	30 (14.15%)	7 (3.30%)	15 (7.08%)	77 (36.32%)	67 (31.60%)	16 (7.55%)	212	3.73 / 5 (74.60%)
								3.73 / 5 (74.60%)

20) How would you rate the introduction of "Commission awards" for excellent poster papers for students and young scientists. This is considered as a possible method for enhancing the visibility of the poster sessions.

	Better dropped from GASS	Uninteresting	Useful	Very important	Critically important for GASS	Responses	Average Score
Commission Student Poster Awards	5 (2.36%)	20 (9.43%)	94 (44.34%)	76 (35.85%)	17 (8.02%)	212	3.38 / 5 (67.60%)
							3.38 / 5 (67.60%)

21) How would you like to see the selection process for the Student Poster Awards to be introduced?

(Choose ONE of the following)

	Percentage	Responses
One Poster Award per Commission	45.8	97
Selection based on the scoring by Programme Committee	20.3	43
Selection based on Poster presentation	22.6	48
I would not like a Poster Award to be introduced	11.3	24
Total responses:	212	

22) URSI Member Committees are present in many regions. Is there any way you are linked with this national committee in your region?

(Check ALL that apply)

	Percentage	Responses
I have an active role in the local URSI Member Committee	20.3	61
I attend meetings of the local URSI member Committee	22.0	66
I attend symposia/workshops organised by the local URSI Member Committee	27.7	83
I was not aware that there is a local URSI Member Committee	24.7	74
There is no URSI Member Committee in my region	5.3	16

23) Have you had the opportunity to participate in URSI activities within your country/region? Can you provide comments on how you participated in your country's URSI activities?

	Percentage	Responses
Yes	31.0	65

No		42.9	90
Other		26.2	55
		Total responses:	210

24) What did you think of communications between your Commission and URSI, the Local Organizing Committee of the XXXth URSI GASS, and the URSI Office?

(The last five responses are given)

- I had no problems but others did!
- My Commission was not very active in communication.
- The commission chair help informative meetings and we elected a vice chair of commission K.
- effective
- Entirely functional

25) What social media do you currently use?

(Check ALL that apply)

		Percentage	Responses
None		34.4	94
Facebook		30.0	82
LinkedIn		27.5	75
Twitter		4.0	11
Other		4.0	11

26) If URSI had a social media presence, would you make use of it?

(Choose ONE of the following)

		Percentage	Responses
Definitely		18.1	38
Probably		27.6	58
I am not sure		17.1	36
Probably not		25.7	54
Definitely not		11.4	24
		Total responses:	210

27) Thank you for your assistance.

If you are willing to be contacted again regarding changes and improvements related to URSI, please provide your contact details here.
This information will be collected by the URSI Secretariat and will not be forwarded to any other organisation or body.

1. Family Name (required):
2. Given name (required):
3. e-mail (required):
4. Institute:
5. Address Line 1:
6. Address Line 2:
7. City:
8. State:
9. ZIP Code:
10. Country:

URSI STANDING COMMITTEE ON YOUNG SCIENTISTS

After the call for the Young Scientist Awards the Member Committees nominated 211 applicants and rated them in sequence. Some candidates were removed from the list immediately, since their application documents were not complete or they had received the YS Award already in the last triennium.

This triennium the Young Scientist program received additional funding from the Member Committee of Japan (USD 5000). URSI is truly grateful for this generous and continued support.

In total 80 Young Scientists could be selected from the funds approved by Council.

The selection yielded:

- 50 applicants from industrial countries
- 30 applicants from developing countries
- 25 of the awardees were female

The URSI Member Committee in Italy managed to obtain extra funds which allowed supporting more Young Scientists originating from Italy in addition to the ones selected by the YS Panel. URSI appreciates this effort to stimulate the participation of Young Scientists to the URSI GASS.

At previous GASS, the budget used for supporting Young Scientists originating from China CIE was approximately € 8000. The URSI Board decided to allocate the same amount of support to Young Scientists originating from China CIE at this GASS, but as travel is domestic in this case and expected to be much cheaper, more Young Scientists originating from China CIE could be awarded. The ranking and selection of the Young Scientists originating from China CIE was carried out by the URSI Member Committee in China CIE.

We want to point out that the distinction between “industrial” and “developing” is sometimes rather arbitrary. A distinction in terms of GDP per capita would be more appropriate.

It can be concluded that the Young Scientist program was very successful due to the high number of applications and due to the high quality of the applications. The Young Scientist Panel especially thanks the URSI Secretariat for all the work they have done to make the selection process efficient and smooth.

K. Schlegel, Chair YS Panel
J. Hamelin, Member, YS Panel
P. Van Daele, Assistant Secretary General

DETAILED REPORT ON THE SCIENTIFIC PROGRAM

Preamble

The Scientific Program Coordinator for XXXI URSI GASS was Prof. Ayhan Altintas, the information manager was Dr. Bo Yu and the associate Scientific Program Manager was Prof. Yihua Yan. They were assisted by the Local Organizing Committee (Lucy Yimin Zhang) and Prof. Peter Van Daele.

Submission and Discussion of Data

Number of submitted paper, accepted papers and the rejected papers are shown in the table attached. For comparison purposes the same tables for the 2008 and 2011 assemblies are also shown.

As can be seen from the tables, commissions C and F experienced a strong increase in submissions; Commissions B and D a mild increase; Commissions A, H, J and K a mild decrease; and Commissions E and G had no significant change. It should be noted that the number of rejected papers was 57 which is quite high compared to 5 in 2011, and 22 in 2008. The overall number of submissions was 1436, up 132 from the previous GA. The increase in the number of submitted papers is mainly due to 504 contributions from China.

The number of papers allocated to oral sessions is 857, and the number allocated to posters sessions 522 representing 8 to 5 ratio in favor of oral presentations. Almost all oral slots were filled except some in Commission A which were used for special discussions.

It was stated that execution of the IEEE copyright is optional, but must be done by those authors who want their work published in IEEE Xplore. Also, IEEE requires that the work was not previously published, and is not and will not be submitted for publication elsewhere.

All authors were notified, at the time of submission, that their work will be deleted from the permanent GASS Proceedings and IEEE Xplore if not presented by one of the

authors or a designated colleague. This requirement applied to both oral poster papers. Even though some authors expressed preference for poster presentation, the overwhelming majority requested oral presentation. Some authors withdrew a poster-assigned paper, sometimes because their employer would cover the cost of the conference only for oral presentation.

It should be clearly stated that papers will be assigned to oral or poster status by the Commission Chairs and requests for change of status will not be honored. Some papers were assigned as oral presentations even though the authors expressed preference for poster presentation. Some authors were not happy with this decision, since they claimed that they have already prepared posters. So, all papers submitted as poster presentations should be classified as posters.

Some authors mentioned that the letter of acceptance stated “your contribution has been accepted to be presented” which was assumed as oral presentation. To remove this misunderstanding, it should be stated as “your paper has been accepted as oral/poster presentation”.

When the final program was posted, some authors requested a change in schedule to accommodate their travel needs and withdrew their contribution when the request was declined, thereby creating last-minute problems in finalizing the scientific program. Many requests for an invitation letter to secure an entry visa to China were received very late, and were often addressed to the Scientific Program Coordinator instead of the LOC. It is recommended that an invitation letter, carefully drafted to satisfy the visa requirements of the host country, be sent to all foreign authors immediately upon acceptance of their contribution, without waiting for a specific request by the author. Some Commissions were late in finalizing their portion of the scientific program. This is a recurring problem, and makes it difficult to prepare the final program in a timely manner, so as to provide sufficient time for participants to make travel arrangements and secure visas.

Respectfully submitted,

Ayhan ALTINTAS
Scientific Program Coordinator
XXXI URSI GASS

APPENDIX: Submission Summary for Last Three General Assemblies

URSI GASS 2014 Submission Summary						
Commission	Total	Accepted	Oral	Poster	Rejected	
A	72	70	58	12		2
B	216	205	98	107		11
C	208	184	94	90		24
D	145	138	92	46		7
E	107	102	85	17		5
F	149	148	97	51		1
G	208	208	85	123		0
H	124	124	86	38		0
J	114	110	84	26		4
K	93	90	78	12		3
Grand Total	1436	1379	857	522		57

URSI GASS 2011 Submission Summary						
Commission	Total	Accepted	Oral	Poster	Rejected	
A	86	86	78	8		0
B	197	193	95	98		4
C	100	100	84	16		0
D	128	128	90	38		0
E	109	109	86	23		0
F	92	92	83	9		0
G	215	215	95	120		0
H	139	139	89	50		0
J	133	133	94	39		0
K	101	100	79	21		1
Grand Total	1300	1295	873	422		5

URSI GASS 2008 Submission Summary						
Commission	Total	Accepted	Oral	Poster	Rejected	
A	65	63	66	3		2
B	305	305	109	196		0
C	100	89	62	27		11
D	78	77	63	14		1
E	107	107	81	26		0
F	95	91	69	22		4
G	239	237	93	144		2
H	172	172	82	90		0
J	205	205	91	114		0
K	115	113	83	30		4
Grand Total	1481	1459	793	666		22

REPORTS ON ACTIVITIES OF INTER-UNION ORGANISATIONS

IUCAF, THE SCIENTIFIC COMMITTEE ON FREQUENCY ALLOCATIONS FOR RADIO ASTRONOMY AND SPACE SCIENCE (2011-2014)

1. Introduction

IUCAF (The Scientific Committee on Frequency Allocations for Radio Astronomy and Space Science) was formed in 1960 as the "Inter-Union Commission on Frequency Allocations for Radio Astronomy and Space Science" by its sponsoring Scientific Unions, URSI, the IAU, and COSPAR. It operates as an ICSU inter-disciplinary committee, and is a Sector Member of the International Telecommunication Union (ITU). The International Telecommunication Union (ITU) (website <http://www.itu.int>) is an international organization under the United Nations, which establishes and maintains international rules on frequency use. Each national radio act is based on the decisions made by the ITU.

IUCAF participates directly and independently in ITU groups and studies. Its main goal is to represent the international astronomical community at the ITU, to ensure the protection of radio frequencies allocated to astronomy and passive space sciences and minimize interference to these scientific observations and measurements.

2. Membership

At the end of May 2014 the membership for IUCAF elected by the three parent organizations was:

URSI	S. Ananthkrishnan (Com J)	India
	S. Reising (Com F)	USA
	I. Häggström (Com G)	Sweden
	A. Tzioumis (Com J)	Australia
	W. van Driel (Com J)	France

IAU	H. Chung	Korea (Republic of)
	H.S. Liszt (Vice Chair)	USA
	M. Ohishi (Chair)	Japan
	T. Gergely	USA
	A. Tiplady	South Africa
COSPAR	Y. Murata	Japan

IUCAF also has a group of Correspondents, in order to improve its global geographic representation and for issues on spectrum regulation concerning astronomical observations in the optical and infrared domains.

3. ITU-related Meetings

During the period of August 2011 to May 2014, IUCAF participated in the following international meetings:

August, 2011	XXIX URSI General Assembly and Scientific Symposium	Istanbul, Turkey
September, 2011	ITU-R Study Group 7 (Science services) and Working Party 7D (Radio Astronomy)	Geneva, Switzerland
January – February, 2012	World Radiocommunication Conference 2012 (WRC-2012)	Geneva, Switzerland
May, 2012	ITU-R Study Group 7 (Science services)	Geneva, Switzerland
June, 2012	Space Frequency Coordination Group meeting (SFCG-32)	Darmstadt, Germany
August, 2012	IAU General Assembly	Beijing, China
September, 2012	ITU Special Seminar on Spectrum Management, and Working Party 7D (Radio Astronomy)	Manta, Ecuador
April, 2013	55th CRAF (Committee on Radio Astronomy Frequency)	Zurich, Switzerland
April, 2013	Working Party 7D (Radio Astronomy)	Geneva, Switzerland
May, 2013	Working Parties 5A (Land mobile, amateur service) and 5B (Aeronautical mobile, radar, etc.)	Geneva, Switzerland

June – July, 2013	Space Frequency Coordination Group meeting (SFCG-33)	Toulouse, France
July, 2013	ITU-R Joint Task Group 4-5-6-7	East London, South Africa
September, 2013	ITU-R Study Group 7 (Science Services) and Working Party 7D (Radio Astronomy)	Geneva, Switzerland
September, 2013	ITU-BIPM Workshop on the Future of Leap Seconds	Geneva, Switzerland
October, 2013	ITU-R Joint Task Group 4-5-6-7	Geneva, Switzerland
November, 2013	Working Parties 5A (Land mobile, amateur service) and 5B (Aeronautical mobile, radar, etc.)	Geneva, Switzerland
February, 2014	ITU-R Joint Task Group 4-5-6-7	Geneva, Switzerland
April, 2014	IUCAF School on Spectrum Management	Santiago, Chile
May, 2014	Working Party 7D (Radio Astronomy)	Geneva, Switzerland
May, 2014	Working Parties 5A (Land mobile, amateur service) and 5B (Aeronautical mobile, radar, etc.)	Geneva, Switzerland
May, 2014	56th CRAF (Committee on Radio Astronomy Frequency)	Dwingeloo, the Netherlands

4. Protecting Radio Astronomy and Passive Space Sciences

At the ITU, the work in the various Working Parties of interest to IAU was focused on the relevant agenda items that were adopted in 2007 for WRC-12 of the ITU, the World Radiocommunication Conference in 2012, as well as on the creation and maintenance of various ITU-R Recommendations and ITU-R Reports.

A WRC-12 agenda item which is most relevant to radio astronomy concerns is the use of the radio spectrum between 275 and 3 000 GHz. This frequency range is used for radio astronomy observations of important spectral lines and continuum bands used in studies to understand the Universe. New receiver technology and new instruments (both ground-based and space based) being used in the 275 – 1 000 GHz region are helping to refine the results of radio astronomy observations in this spectrum range, while similar

developments in the 1 000-3 000 GHz range are leading to a better understanding of specific spectral lines and atmospheric windows that are of interest to radio astronomers. Significant infrastructure investments are being made under international collaboration for the use of these bands between 275 and 3 000 GHz. For example, the Atacama Large Millimeter/submillimeter Array (ALMA), a facility currently under construction in northern Chile, will provide new insights on the structure of the universe through observations in the 30 - 1 000 GHz range. Space-based highly sensitive telescopes observe spectral lines from a variety of molecules and atoms and continuum thermal radiation from very small particles (cosmic dust).

No frequency allocations for the use of this frequency range will be made at WRC-12, but the radio astronomy community has to identify a list of specific bands of interest. This list was established in close collaboration with the IAU Working Group on Important Spectral Lines, and a new ITU-R Recommendation RA.1860 (Preferred frequency bands for radio astronomical measurements in the range 1-3 THz) was published on February, 2010. Terrestrial use of frequencies in this range is strongly constrained by the Earth's atmosphere. This is especially true above 1 000 GHz, where atmospheric absorption at sea level sites can exceed thousands of dB per km due to the effects of water vapor and oxygen. A new Report ITU-R RA.2189, which was published in 2010, utilized these physical conditions and reports that this frequency range can be used both by the passive (receiveonly) and active (transmitting) radio services with little possibility of interference.

Power Line Communications (PLC) utilizing the 2-30 MHz frequency range is a technology to send electrical signals through power lines for communication purposes. This technology enables broadband Internet access and home LAN by means of "existing" power lines. Since the power lines are designed and installed to carry current at 50/60Hz only, there has been serious concern that the electromagnetic field radiated by the power lines may cause harmful interferences to the radio communication services such as broadcasting, communication, and radio astronomy observations. In this regard radio astronomers submitted to ITU-R Working Party 1A (spectrum management) several contribution papers containing measurement results of actual harmful interference from PLC and theoretical analyses. These study results were welcomed by the ITU-R Working Party 1A, and were adopted as a part of the ITU-R Report SM.2158 (Impact of power line telecommunication systems on radiocommunication systems operating in the LF, MF, HF and VHF bands below 80 MHz).

It should be noted that the disturbance caused by PLC systems has been an issue in Com. E of URSI.

5. The 3rd IUCAF-Summer School

The 3rd IUCAF summer school on spectrum management for radio astronomy was held between May 31st and June 4th, 2010, at the Mitaka campus of the National Astronomical Observatory of Japan (NAOJ), located about 20 km from central Tokyo. There were 44 participants from 13 countries: Japan (21), Germany (3), UK (2), Denmark (1), the Netherlands (2), Portugal (2), USA (5), China (2), South Korea (2), Australia (2), Malaysia (1) and Nigeria (1). There were about 10 young (under 35 years old) people that were new to the spectrum management and seven regulators from Japan, China and Europe.

The summer school program covered introductions to radio astronomy and Earth observations, radio science and related technologies and procedures on how to use (allocate) frequency resources. This includes the structure and role of the International Telecommunication Union (ITU) and regional telecommunities (CEPT, CITELE, APT); the roles of science bodies to protect radio astronomy and Earth observations (IUCAF, CRAF, CORF, RAFCAP); interference mitigation techniques; and radio interference topics such as Power Line Telecommunications (PLT), RFID, Ultrawideband (UWB) devices, Software-Defined Radio (SDR), Cognitive Radio Systems (CRS), and others. There was also a lecture on the SKA project and radio quiet zones for future radio astronomy. The summer school program and the presentation files used at the summer school are available from the IUCAF's web page at http://www.iucaf.org/SSS2010/presentations/SS2010_presentations.htm .

It should be noted that the summer school was supported financially by IUCAF, CRAF, CORF and RAFCAP. The summer school was run in a very friendly atmosphere and excellent weather, and the participants, especially young students, actively asked questions. In the middle of the summer school, the participants enjoyed a half-day tour to the Nobeyama Radio Observatory of NAOJ, where the 45-m millimetre-wave telescope, the Nobeyama Millimeter Array, and the Nobeyama Radio Heliograph are located. It can be concluded that the 3rd IUCAF summer school was quite successful, and that the participants were able to learn many topics to be utilized to ensure the protection of radio astronomy and Earth observations towards better understanding of the Earth and the Universe.

6. Contact with the Sponsoring Unions and ICSU

IUCAF maintains regular contact with its supporting Scientific Unions and with ICSU. The Unions play a strong supporting role for IUCAF and the membership is greatly encouraged by their support.

Pursuing its brief, IUCAF continued its activities towards strengthening its links with other passive radio science communities, in particular in space science, and defining a concerted strategy in common spectrum management issues.

The preparation towards the next URSI General Assembly and Scientific Symposium (GASS), to be held in August 2011 in Istanbul, is ongoing, led by the Chair of URSI Commission J (radio astronomy), S. Ananthakrishnan, who is also an IUCAF member. Several session proposals were submitted, and a session on spectrum allocation and use issues (session J08) will be held during the URSI GASS. Many IUCAF members have already submitted papers to be presented at this GASS.

IUCAF members also actively participated in national URSI meetings, such as AP-RASC 2010 held in Toyama, Japan and the USNC-URSI National Radio Science Meeting in Boulder, CO, USA. IUCAF member W. van Driel has been appointed president of IAU Commission 50 (Protection of existing and potential observatory sites). Two IUCAF members, A. Tzioumis and M. Ohishi, have joined the Organising Committee of IAU Commission 50. IUCAF member, A. Tzioumis, was Chair of the Working Group on Radio Frequency Interference of IAU Division X (radio astronomy) until August 2009, and IUCAF member, W.A. Baan, has been appointed as the new chair of this Working Group. IUCAF chair, M. Ohishi, chairs the Working Group on Astrophysically Important Spectral Lines of Division X. The IUCAF chair, M. Ohishi, has also been appointed the president of IAU Commission 5 on Documentation and Astronomical Data. He is also appointed the official liaison between the IAU and the ITU.

IUCAF has been recognized in the ICSU as an international body, however, it has been categorized into “Data and Information” group, which has not been correct. The chairman contacted the ICSU several times, and is now categorized into a “Thematic Organization”. See at <http://www.icsu.org/about-icsu/structure/interdisciplinary-bodies-1>.

7. Conclusions

The WRC-12 is scheduled from January 23 to February 17, 2012 to be held in Geneva, Switzerland. Several radio astronomers are expected to participate in the WRC-12. IUCAF interests and activities range from preserving what has been achieved through regulatory measures or mitigation techniques, to looking far into the future of high frequency use, giant radio telescope use and large-scale distributed radio telescopes. Current priorities, which will certainly keep us busy through the next years, include the use of powerful radars and satellite down-links close in frequency to the radio astronomy bands, the coordination of the operation in shared bands of radio observatories and powerful transmissions from downward-looking satellite radars, the possible detrimental effects of ultra-wide band (UWB) transmissions at around 24/79 GHz regions and

highfrequency power line communications (HF-PLC) on all passive services, the scientific use of the 275 to 3 000 GHz frequency range, and studies on the operational conditions that will allow the successful operation of future giant radio telescopes.

IUCAF is grateful for the moral and financial support that has been given for these continuing efforts by ICSU, COSPAR, the IAU, and URSI during the recent years. IUCAF also recognizes the support given by radio astronomy observatories, universities and national funding agencies to individual members in order to participate in the work of IUCAF.

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BUSINESS TRANSACTED BY COMMISSIONS

COMMISSION A - ELECTROMAGNETIC METROLOGY

1. Results of Election of Vice Chair and Early Career Representative

Elections were conducted for the positions of Vice Chair and Early Career Representative during Business Meeting 1. The ballots (both mail-in and on-site) were counted by Yasuhiro Koyama. As a result, Patrizia Tavella (INRIM, Italy) and Pedro Miguel Duarte Cruz (NSF, Portugal) were elected as candidates for Vice Chair and Early Career Representative. At the Council Meeting on August 19, both were formally approved as the Vice Chair and the Early Career Representative.

2. Appointment of Associate Editor for *Radio Science Bulletin*

Since the Past Chair, Vice Chair, and Early Career Representative are expected to become the Editors, it was decided to recommend Parameswar Banerjee (Amity University, India), Patrizia Tavella (INRIM, Italy), and Pedro Miguel Duarte Cruz (NSF, Portugal) as Commission Editors. Luk R. Arnaut (University of Nottingham, UK) volunteered to become an Editor, and it was also decided to recommend him as a Commission Editor.

3. Updates/Status of Working Groups

It was proposed to establish a new working group focusing on education and training for metrology. There are many institutes providing such education and training, and it will be very helpful if we can share valuable materials and resources. Since the formal establishment of the new working group will require detailed terms of reference and a list of membership, it was proposed to start from an ad-hoc group with the task of collecting

the information on training organized by the various institutes and sharing the information. The name of Bruce Warrington (NMIA, Australia) was suggested as the most appropriate candidate as a Chair of the ad-hoc group.

4. Updates to the Terms of Reference of the Commission

The Terms of Reference of Commission A were reviewed, and the necessity of updating was discussed during Business Meetings 1 and 2. As a result, some changes were proposed, and the draft revised Terms of Reference were presented at the Council meeting. The revisions were approved for the 2014-2017 term. In Business Meeting 3, some additional suggestions were discussed to update the Terms of Reference to reflect the present activities of Commission A. It was understood that the current Terms of Reference are intended to include broader areas, so as to attract more researchers to participate in activities of Commission A. This will be discussed again in the business meetings at the next GASS in 2017. It was asked that participants come prepared to discuss whether further revisions would be useful at that time.

Terms of Reference for Commission A (2014-2017)

The Commission promotes research and development of the field of measurement standards and physical constants, calibration and measurement methodologies, improved quantification of accuracy, traceability, and uncertainty, and the inter-comparison of such. Areas of emphasis are:

1. the development and refinement of new measurement techniques and calibration standards, including antenna techniques
2. primary standards, including those based on quantum phenomena, and the realization and dissemination of time and frequency standards
3. characterization of electromagnetic properties of materials, physical constants, and properties of engineered materials, including nanotechnology
4. methodology of space metrology and electromagnetic dosimetry/measurements for health diagnostics, applications, and biotechnology, including bio-sensing 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.

5. Proposed Sessions for the Next GASS

For the GASS2017, the following sessions were proposed:

- Complex Isotropic and Anisotropic Magnetodielectrics
- Nonlinear Measurements
- Space Metrology
- SI Units
- Metrology in the THz Region
- Time Scale
- Advanced Time and Frequency Transfer Techniques
- Education and Training in Metrology
- Advances in Sensor Development and Applications
- Mode-Stirred Chambers

As one of the themes for General Lectures at GASS2017, a lecture about the SI units by Terry Quinn, Emeritus Director of the BIPM, was proposed.

6. Proposed Sessions for the AT-RASC

For the AT-RASC2015, the following topics have been provided for Commission A:

Antennas, Bioeffects and Medical Applications, EM-Field Metrology, EMC and EM Pollution, Impulse Radar, Interconnect and Packaging, Materials, Microwave to Sub-Millimeter Measurements/Standards, Millimeter-Wave and Sub-mm Wave Communications, Noise, Planar Structures and Microstrip Circuits, Quantum Metrology and Fundamental Concepts, Time and Frequency, Time Domain Metrology, Techniques for Remote Sensing, Measurements and Calibration in Propagation, Space Plasma Characterization, Material Characterization, RFID, Biological Effects, Signal Enhancement for EM Metrology, Scattering Calibration, References (Bi-Static), Noise Measurement Standards – A Review of Radiometers

It was recognized that the proposals for special sessions are due by October 17, 2014, and ideas for proposals were encouraged.

7. Other Business

The possibility of Commission A again responding to the formal request for opinions from the International Telecommunication Union (ITU) to URSI about the redefinition of Coordinated Universal Time (UTC) was discussed. Although it will be late for inclusion in the background document for the World Radio Conference in 2015, the participants of Business Meeting 3 felt it was a good idea to update the 1999 opinion of Commission A, and to propose that the Council meeting of URSI send it as the opinion of Commission A to the ITU. Some participants (Yasuhiro Koyama, Patrizia Tavella, Felicitas Arias, Demetrios Matsakis, and E. Van Lil) volunteered to update the document as a resolution from the business meeting of URSI Commission A. The document was then submitted at the Council meeting on August 23. The Council decided to forward the document to the Scientific Committee on Frequency Allocations for Radio Astronomy and Space Science (IUCAF) for comments and further action. After some discussion between the representatives of IUCAF and URSI, the document was submitted to ITU-R as an input document.

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Early Career Representative: Pedro Miguel Duarte Cruz Instituto de Telecomunicações,

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COMMISSION B - FIELDS AND WAVES

Commission B held three business meetings during the Beijing GASS. There were around 50 participants present on the Monday meeting, 34 on Wednesday, and 20 on Friday. Unfortunately no attendance list was circulated on Monday, and hence the number 50 is an estimate.) Giuliano Manara (Chair of Commission B) chaired the meetings, assisted by Ari Sihvola (Vice Chair of Commission B).

1. Results of Election of Vice Chair

Two candidates were running for the position of Vice Chair for Commission B for 2014-2017. In the vote during the Monday evening business meeting, Prof. Kazuya Kobayashi received 43 votes, against 30 votes for the runner-up (Prof. Sembiam Rengarajan). Altogether, 25 official Members participated in the vote (two ballots were cast onsite). Prof. Kobayashi was later confirmed on Tuesday as the incoming Vice Chair by the Council.

2. Results of Election of Early Career Representative

Likewise, two candidates were running for the ECR representative for Commission B for 2014-2017. In the vote during the Monday evening business meeting, Prof. Lianlin Li received 27 votes, against 26 votes for the runner-up (Dr. Joseph Constantine). Altogether, 18 Member countries participated in the vote (six ballots were cast onsite). Due to the very close result, Commission B decided to leave the final selection to the Council. The Council selected Professor Li in its Tuesday meeting as the Early Career Representative for Commission B.

3. Appointment of Associate Editor for *Radio Science Bulletin*

Both the new Vice Chair, Kazuya Kobayashi, and the Early Career Representative, Lianlin Li, were nominated as Associate Editors for the *Radio Science Bulletin*.

4. Updates/Status of Working Groups

The status of Working Groups was not discussed.

5. Updates to Terms of Reference of Commission

The Commission B Terms of Reference were discussed. No updates were necessary.

6. Meetings Proposed to be Supported in the Coming Triennium

The main event of Commission B is the triennial Electromagnetic Theory Symposium (EMTS). This will be held in Espoo, Finland, August 14-18, 2016. The funding for the Commission from URSI (9000€) will be reserved for supporting the Young Scientists to the EMTS 2016 meeting.

Commission B will also work actively in the preparation and organization of the symposia of the parent organization: URSI GASS (Montréal, 2017) and the emerging AT-RASC (Gran Canaria, 2015).

Concerning the 2017-2020 triennium, the proposal by the USNC of URSI to hold the 2019 EMT Symposium in San Diego, California, was accepted. The proposal was presented by Prof. Sembiam Rengarajan, the US Member Committee representative in Commission B.

7. Report and Comments on the Scientific Program of the Commission for the Current GASS

Commission B organized 14 oral sessions and two poster sessions. In addition, Commission B was the lead Commission in seven oral sessions, and participated in 12 other joint sessions. Altogether, 98 oral papers and 107 posters were accepted. Only one no-show occurred in the oral sessions.

The Commission B Tutorial Lecture, “Controlling Waves on Metasurfaces,” was given by Prof. Stefano Maci of the University of Siena, Italy.

Overall, the sessions organized by Commission B were extremely successful. The quality of the presentations was very high and the sessions attracted a large number of participants, over one hundred at peak.

Commission B also organized an eight-hour School for Young Scientists on Saturday and Sunday before the symposium. The instructor was Prof. Nader Engheta (University of Pennsylvania). The topic of his lectures was “Fields and Waves in Metamaterials.”

Among the 10 finalists of the Student Paper Competition in URSI GASS, there were three candidates from Commission B. They won the first three prizes:

First prize: Filipa Prudêncio (University of Lisbon, Portugal; supervisor Prof. Carlos Paiva). Her presentation was entitled, “The Most General Classes of Tellegen Media Reducible to Simple Reciprocal Media: A Geometrical Approach”

Second prize: Simon Adrian (Télécom Bretagne, France, and Technische Universität München, Germany; supervisor Prof. Francisco Andriulli). His presentation was entitled, “Hierarchical Bases on the Standard and Dual Graph for Stable Solutions of the EFIE Operator”

Third prize: Andreas Ericsson (Lund University, Sweden; supervisor Prof. Daniel Sjöberg). His presentation was entitled, “A Resonant Circular Polarization Selective Structure of Closely Spaced Morin Helices”

Concerning the URSI awards presented in the opening ceremony of the Beijing GASS, two awardees were closely affiliated with Commission B: Prof. Nader Engheta (Balthasar Van der Pol Gold Medal) and Prof. Francesco P. Andriulli (Issac Koga Gold Medal). Furthermore, the research work by the recipient of the John Howard Dellinger Gold Medal, Prof. Jean-Pierre Bérenger, was directly linked to the domain of Commission B.

8. Other Business

The Commission B officials for the 2014-2017 triennium are as follows:

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COMMISSION C - RADIO-COMMUNICATION SYSTEMS AND SIGNAL PROCESSING

1. Results of Election of Vice Chair

Two distinguished candidates were nominated for the position of Vice Chair: Prof. Amir Zaghloul from Virginia Tech in the US, and Prof. Said El-Khamy from Alexandria University in Egypt. Both candidates were present at the meeting, and gave a statement about their vision of URSI in general, and Commission C in particular. Collecting the votes received by e-mail as well as those expressed at the meeting, the count was in favor of Prof. Amir I. Zaghloul to act as the new Commission C Vice Chair.

2. Results of Election of Early Career Representative

Three candidates were nominated for the Early Career Representative (ECR): Ms. Noha Ossama El-Ganainy, from the Arab Academy of Science and Technology, Egypt; Mr. Ruisi He, from the Université Catholique de Louvain, Belgium; and Dr. Hongjian Sun, from Durham University, UK. Ruisi He was present at the meeting, and presented himself and his view of his role as ECR. Collecting the votes received by e-mail as well as those expressed at the meeting, the count was in favor of Ruisi He, who will act as Commission C's ECR.

3. Appointment of Associate Editor for *Radio Science Bulletin*

Both Prof. Amir Zaghloul and Prof. Said El-Khamy were appointed as Associate Editors to cover the diverse topics of Commission C.

4. Updates/Status of Working Groups

Commission C currently has no working groups.

5. Updates to Terms of Reference of Commission

The terms of reference were reviewed, and it was agreed that they continue to be appropriate and representative of Commission C. No changes were therefore made.

6. Meetings Proposed to be Supported in the Coming Triennium

For a number of years, Commission C has organized the International Symposium on Signals Systems and Electronics (ISSSE). It is proposed to continue supporting this main conference of Commission C.

7. Report and Comments on the Scientific Program of the Commission for the Current GASS

In the GASS 2014, Commission C received an exceptionally large number of papers: in excess of 200 papers, covering all of the various areas of the Commission. This reflects the expansion in wireless communication systems, information theory, radar technology, and signal processing. The Commission is pleased to announce that its nominee, Prof. Dr. H. V. Poor, USA, was awarded the Issac Koga Gold Medal.

8. Proposed Sessions for the Next GASS

A number of sessions are planned for the next GASS. Topics include information theory and coding; distributed radar; energy harvesting and green communications; massive multiple antenna technology for future wireless communications; mm-wave communications for small cells and backhaul and indoor access; multi-tier multi-frequency networks; radio localization techniques: satellite, indoor, in tunnels, autonomous; circuit technologies for mobile communications; signal processing for cognitive radio; challenges and advances of carrier aggregation below 6 GHz; resource allocation; and remote sensing.

9. Proposed Sessions for the AT-RASC

The Commission's ISSSE conference is collocated with the AT-RASC, where open and invited special sessions are organized. Topics include 5G, information theory and coding, multiple antenna technology, cognitive radio, green communication, and energy harvesting. In addition, a number of joint sessions were organized with Commissions D and F. The ISSSE will run for three days, May 19-21. The symposium is sponsored by URSI, with technical sponsorship from the IET.

10. Other Business

None.

Chair: Prof. Sana Salous

School of Engineering and Computing Sciences, Durham University, UK DH1 3LE

Vice Chair: Prof. Amir Zaghloul

US Army Research Laboratory and

Virginia Tech, Bradley Department of Electrical and Computer Engineering

Early Career Representative: Dr. Ruisi He

Associate Professor, State Key Laboratory of Rail Traffic Control and Safety, Beijing Jiaotong University, Beijing, 100044, China

COMMISSION D - ELECTRONICS AND PHOTONICS

1. Results of Election of Vice Chair

There were two candidates for the position of Vice Chair. Hong Guo (China (CIE) and Apostolos Georgiadis (Spain). The result of the election was that Apostolos Georgiadis was elected Vice Chair.

2. Results of Election of Early Career Representative

There were three candidates for the position of the Early Career Representative: Ergun Simsek (USA), Radek Smid (Czech Republic), and Arnaud Vena (France). As a result of the election, Arnaud Vena was elected Early Career Representative.

3. Appointment of Associate Editor for *Radio Science Bulletin*

Arnaud Vena accepted acting as Associate Editor for the *Radio Science Bulletin*.

4. Updates/Status of Working Groups

4.1 D.1 RFID Technologies and Privacy of Data

The Chair is Smail Tedjini (France), and the Vice Chair is Gaetano Marrocco (Italy). We wish to continue, and expect to produce a document/report for the next triennium. There is no change in the representative of this WG, but we plan to invite new participants from the other Commissions, and also some external contributors.

5. Updates to Terms of Reference of Commission

New terms of reference were proposed for Commission D during the business meeting at GASS 2014, Beijing:

The Commission promotes research and reviews new developments in:

- Electronic devices, circuits, systems and applications;
- Photonic devices, circuits, systems and applications;
- Physics, materials, modeling, design, technology and reliability of devices down to nanoscale devices including quantum devices, with particular reference to radio science applications.

The Commission deals with devices for generation, detection, storage, and processing of electromagnetic signals together with their applications from the low frequencies to the optical domain.

La Commission tend à promouvoir les recherches et la revue des nouveaux développements dans:

- dispositifs électroniques, circuits, systèmes et applications;
- dispositifs photoniques, circuits, systèmes et applications;
- physique, matériaux, Modélisation, conception, technologie et fiabilité des dispositifs jusqu'au dispositifs nanométrique y compris les dispositifs quantique présentant un intérêt particulier pour les applications des radiosciences.

La Commission étudie les dispositifs pour la génération, la détection, le stockage, et le traitement des signaux électromagnétiques, ainsi que leurs applications des basses fréquences au domaine optique.

6. Meetings Proposed to be Supported in the Coming Triennium

Not applicable.

7. Report and Comments on the Scientific Program of the Commission for the Current GASS

Not applicable.

8. Proposed Sessions for the Next GASS

Topic (Commissions)

Contact: E-mail

Radio Signal Processing (D, DBC)

C. Caloz: christophe.caloz@polymtl.ca

Energy Harvesting (DB, DBC)

S. Tedjini: Smail.tedjini@grenoble-inp.fr

Wireless Sensing (D, DB)

Ching Eng Jason: pngce@ihpc.a-star.edu.sg

THz (D)

J-L Coutaz: Jean-Louis.Coutaz@univ-savoie.fr

Quantum Optics Information and Metrology (D, DA)

Hong Guo: hongguo@pku.edu.cn

Frontiers in Optical Fibers (D)

S. Selleri: stefano.selleri@unipr.it

Micro and Nano Photonic Devices (D)

F. Kaertner: franz.kaertner@cfel.de (C. Wong)

9. Proposed Sessions for the AT-RASC

D1 Trends in RFID for Identification and Sensing

D2 Energy Harvesting in Wireless Systems

D3 RF MEMs and NEMS

D4 Trends in THz Communications

D5 60 GHz Electronics

D6 Multi-Physics Modeling in Radio Frequency Nanoelectronics

D7 Graphene Nanoelectronics Applications

D8 Plasmonics

D9 Fiber Lasers and Solid State Lasers

D10 Optical Sensors and Biosensors

D11 Signal Processing Antennas

D12 Broadband Ubiquitous Network

D13 Special Sessions

Special Sessions:

S-D: Photonics in the International Year of Light

S-AD: Wireless Power Transmission and Energy Harvesting

Chair: Günter Steinmeyer

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COMMISSION E - ELECTROMAGNETIC ENVIRONMENT AND INTERFERENCE

1. Results of Election of Vice Chair

There were two candidates for the position of Vice Chair. They were Prof. F. Gronwald and Prof. Y. Hobara. 15 votes received from Canada, China (CIE), Germany, India, Ireland, Israel, Italy, Japan, Korea, Netherlands, Norway, Portugal, Switzerland, UK, and USA.

Dr. Frank Gronwald was declared elected as the Vice Chair of Commission E for the current triennium.

2. Results of Election of Early Career Representative

There were three candidates for the position of Early Career Representative. They were G. Gradoni, Ch. Kasmi, and N. Mora Parra. 17 votes were received from Brazil, China (CIE), Egypt, France, Germany, India, Japan, Korea, Netherlands, Norway, Portugal, Russia, S. Africa, Sweden, Switzerland, UK, and USA.

Dr. Gabriele Gradoni was declared elected as the Early Career Representative (ECR) of Commission E for the current triennium.

3. Appointment of Associate Editor for *Radio Science Bulletin*

Dr. F. Gronwald (Vice Chair elect) was appointed as the Associate Editor for the *Radio Science Bulletin*.

4. Updates/Status of Working Groups

A number of working groups have been established to provide focus for a number of activities relevant to the theme of Commission E. These are outlined below, together with the contact person and, where appropriate, a brief summary of the group's activities during the three-year period.

4.1 E1. Terrestrial and Planetary Electromagnetic Noise Environment

Co-Chairs: C. Price (Israel), Y. Hobara (Japan), A. P. Nickolaenko (Ukraine), and K. Hattori (Japan)

This working group deals with the study of the characteristics of electromagnetic noise taking place not only in the terrestrial but also in the planetary environment. The

most well-known noise is the atmospheric radio noise from lightning discharges (the so-called sferics, in a wide frequency range from ULF to VHF). Some examples of topical subjects on sferics are (1) monitoring of global lightning activity as studied by high-frequency noise and Schumann resonance phenomena in the ELF band, and (2) ELF transients related to the optical emissions in the mesosphere due to the lightning. Higher-frequency lightning emission provides us with the information on the fine structure of lightning electrical structure, while lower-frequency noise provides us with the macroscopic nature of lightning. The noise coming from the ionosphere/magnetosphere will be discussed as well: micro-pulsations in the ULF range, VLF/ELF emissions and HF emissions due to the plasma instabilities in space. Also, our recent topic is radio emission from the lithosphere, which again covers a wide frequency range, from dc to VHF (or even more). The characteristics and generation mechanisms of those effects and also the seismic effect on the ionosphere will be discussed. Finally, the radio noise environment on other planets (such as Jupiter) will also be our topic. The interactions of these natural noises with artificial noises due to human activity is another subject. Power-line harmonic radiation penetrates into the ionosphere/magnetosphere and induces particle precipitation into the lower ionosphere (this is a kind of pollution of the natural environment by human activity). We also discuss the interaction of the natural environment with human activity.

4.2 E2. Intentional Electromagnetic Interference

Co-Chairs: M. Bäckström (Sweden) and W. Radasky (USA)

This working group studies the area of intentional electromagnetic interference (IEMI), which is defined by the IEC as the “Intentional malicious generation of electromagnetic energy introducing noise or signals into electric and electronic systems, thus disrupting, confusing, or damaging these systems for terrorist or criminal purposes.” In particular, this working group focuses on electromagnetic threat weapons, the coupling to electronic systems, the vulnerability of systems to these types of transients, and the protection of systems from the IEMI threat.

Over the 2011-2014 period, a large number of conferences dealt with IEMI, along with other aspects of HPEM:

- Joint IEEE AP-S and URSI meeting in Spokane, Washington, July 3-8, 2011. Dr. Giri and Prof. Uslenghi organized an “In Memoriam” special session to remember Dr. Carl Baum (11 papers).
- URSI General Meeting in Istanbul, Turkey, August 15-19, 2011. There was a session organized by Dr. Sabath and Dr. Radasky entitled “High Power EM and IEMI,” with 11 papers presented.
- A weeklong short course, HPE 201-2011, was presented in Schloss Noer, Germany, September 18-24, 2011. Dr. Dave Giri served as lecturer and course director.

- IEC SC 77C (High Power Transient Phenomena) Project and Plenary Meetings in Seoul, South Korea, October 19-21, 2011. Work continued on IEMI and HEMP standards for protecting civil systems from these threats. Dr. Radasky chairs IEC SC 77C and the Secretary is Dr. Hoad.
- USNC-URSI conference in Boulder, Colorado, January 4-7, 2012. Several papers were presented dealing with IEMI.
- APEMC in Singapore, May 21-24, 2012. A special session on HEMP and IEMI was organized by Dr. Radasky. Another regular session on HPEM was also held. A total of eight papers were presented.
- EUROEM symposium held in Toulouse, France, from July 2-6, 2012. This symposium was dedicated entirely to HPEM topics, and had 218 papers and 312 participants. There was a significant number of papers dealing with IEMI.
- IEEE EMC symposium held in Pittsburgh, Pennsylvania, from August 4-10, 2012. A workshop was held dealing with intentional EMI (IEMI), and 15 papers were submitted dealing with HPEM and also EM information leakage.
- Joint ICEAA 2012 – IEEE APWC 2012 – EEIS 2012 (URSI Commission E) conference held in Cape Town, South Africa, September 2-7, 2012. Eleven papers were presented dealing with various aspects of HPEM, including IEMI.
- Conference on Environmental Electromagnetics (CEEM) held in Shanghai, China (CIE), from November 6-9, 2012. Several sessions were organized with IEMI papers.
- Directed Energy Professional Society (DEPS) Symposium held in Albuquerque, New Mexico, from November 26-30, 2012. While this conference was aimed mainly at source development, there was a session that included papers covering HEMP and IEMI.
- National Radio Science Meeting sponsored by the USNC-URSI held in Boulder, Colorado, from January 9-12, 2012. There were a few papers dealing with HPEM and IEMI at this meeting.
- An IET seminar entitled “Extreme Electromagnetics – The Triple Threat to Infrastructure,” held in London, England, on January 14, 2013. Ten papers were presented dealing with impacts of HPEM (HEMP, IEMI, and severe geomagnetic storms) on the critical infrastructures.
- Asia-Pacific EMC (APEMC) symposium held in Melbourne, Australia, from May 18-23, 2013. There was a workshop on the protection of commercial facilities from HEMP and IEMI, and there was a special session on HPEM with eight papers presented.
- IEEE EMC symposium held in Denver, Colorado, from August 4-8, 2013. There was a workshop on EM information leakage, and a special session on IEMI with six papers presented.
- A session entitled “Intentional EMI (IEMI) and EMC” was organized at PIERS 2013, August 12-15, 2013, in Stockholm, with eight papers.
- EMC Europe Symposium held in Brugge, Belgium, from September 2-6, 2013. There was a workshop presented on the impact of IEMI on the critical infrastructures in

Europe, reviewing the work of three special EU-funded projects. A special session on EM information leakage was also held.

- 8th Future Security Research Conference in Berlin, September 17-19, 2013. There were session, “Electromagnetic Threats and Countermeasures,” consisting of seven papers, and a panel session with the same title.
- IEC SC 77C (High Power Transient Phenomena) project and plenary meetings held in Ottawa, Canada, from September 23-27, 2013. Work continued on IEMI and HEMP standards for protecting civil systems from these threats. Dr. Radasky chairs IEC SC 77C, and the Secretary is Dr. Richard Hoad from the UK.

4.3 E3. High-Power Electromagnetics

Co-Chairs: F. Sabath (Germany) and R. L. Gardner (USA)

The objective is to encourage research in high-power electromagnetics (HPE). The technical area of HPE consists of the physics and engineering associated with electromagnetic sources, where nonlinear effects associated with high-field regions (and air breakdown) must be included in the analysis and design. This includes (but is not limited to) EMP simulators, high-power narrowband and mesoband sources and antennas, and hyperband (impulse) sources and antennas. It also includes the environment near lightning channels and in nuclear EMP source regions. In some cases, it includes the high field regions on or in targets, because of local field enhancement.

4.4 E4. Lightning Discharges and Related Phenomena

Chair: V. A. Rakov (USA) and S. Yoshida (Japan)

Lightning discharges are one of the two natural sources of electromagnetic interference (EMI), the other being electrostatic discharge. Electric and magnetic fields generated by lightning represent a serious hazard to various systems, particularly those containing sensitive electronics. This WG focuses on the characterization of lightning and its interaction with engineering systems and with the environment, as well as on lightning detection and testing. It covers all aspects of lightning research, including observations, field and laboratory experiments, theoretical studies, and modeling.

Sessions on lightning discharges and related phenomena were organized at PIERS 2011 in Marrakesh, ICAE 2011 in Rio de Janeiro, ICLP 2012 in Vienna, GROUND/LPE 2012 in Bonito, SIPDA 2013 in Belo Horizonte, GROUND/LPE 2014 in Manaus, and ICAE 2014 in Norman, Oklahoma.

4.5 E5. Interaction With and Protection of Complex Electronic Systems

Co-Chairs: F. Gronwald (Germany), J-P. Parmentier (France), and H. Reader (South Africa)

This working group studies the various electronic and electromagnetic aspects related to the interaction with and protection of complex electronic systems. The focus

is the analysis of the various coupling paths and their associated transfer functions into complex electronic systems, as formalized in the framework of electromagnetic topology. Analytical, numerical, and measurement techniques are used to characterize the electromagnetic fields and currents in a complex environment. In the analysis, special attention is placed on the emergence of new technologies, and the inclusion of advanced materials and communication systems. Functional safety is an integral part of the studies

4.6 E6. Spectrum Management

Chair: T. Tjelta (Norway) and R. Struzak (Poland)

The E6 focus is on sound scientific spectrum management for improved utilization of the radio frequencies for protection of wireless communications service and radio science. The goal is to assure further development of radio science and communication services, unobstructed by potential radio interference due to unwanted energy in the form of out-of-band and in-band encroaching and deleterious in-band and out-of-band emissions. The electromagnetic spectrum is treated as a limited natural resource, with a multitude of competing demands for access to it and use of it. Spectrum management seeks innovative means and technologies for adequate coexistence of all of them, taking into account the need of protection of new and incumbent wireless and wired communication services, systems, and equipment, with special focus on science services and those that use passive technologies.

Two of the papers presented at the previous GASS were revised and submitted to the *Radio Science Bulletin*, and were published in No. 340, on the topics

- Spectrum Management Overview
- Opportunistic Secondary Spectrum Access: Opportunities and Limitations

The WG planned a session at the first Commission E Electromagnetic Environment and Interference Symposium (EEIS 2012) in Cape Town, but there was very limited response and, in the end, no session on spectrum management. This was seen as a good opportunity to deal with the spectrum issues in between the General Assemblies.

A session on spectrum-management topics has been planned together with Commission J for the GASS 2014. Some papers were received, and the session will be held.

It appears difficult to engage the community in between General Assemblies to address spectrum-management topics: either to improve spectrum utilization, or to ensure an acceptable, “interference free” environment for radio science services.

4.7 E7. Geo-Electromagnetic Disturbances and Their Effects on Technological Systems

Chair: A. Viljanen (Finland)

4.8 E8. Electromagnetic Compatibility in Wired and Wireless Systems

Co-Chairs: A. Zeddani (France), F. Rachidi (Switzerland) and F. Gronwald (Germany)

The intensive use of the electromagnetic spectrum for communications has resulted in issues of compatibility and interoperability between different users. In addition, the continual increase in the operating frequencies of products and higher frequency sources of disturbances (such as ultra-wideband systems) has resulted in an increase of potential EMC problems in communication systems, and the use of power lines for carrying data is adding to interference problems. This session will focus on theoretical and experimental EMC aspects in both wired and wireless communication systems. Potential remedies will be also addressed.

4.9 Commission E Joint Working Groups

4.9.1 Inter-Commission Working Group on Solar Power Satellites

Chair: H. Matsumoto (Japan)

Co-Chair for Commission E: J. Gavan (Israel)

4.9.2 Inter-Commission Working Group on Natural and Human Induced Hazards and Disasters

Co-Chair for Commission E: W. A. Radasky (USA)

4.9.3 EGH. Seismo Electromagnetics (Lithosphere-Atmosphere-Ionosphere Coupling)

Co-Chair for Commission E: M. Hayakawa (Japan)

5. Updates to Terms of Reference of Commission

There were no updates to the Terms of Reference.

The current Terms of Reference are as follows:

Commission E promotes research and development in:

- a. Terrestrial and planetary noise of natural origin, seismic-associated electromagnetic fields;
- b. Man-made electromagnetic environment;
- c. The composite noise environment;
- d. The effects of noise on system performance;
- e. The effects of natural and intentional emissions on equipment performance;
- f. The scientific basis of noise and interference control, electromagnetic compatibility;
- g. Spectrum management.

6. Meetings Proposed to be Supported in the Coming Triennium

Commission E will support the following meetings in the current triennium:

- First URSI Atlantic Radio Science Conference (URSI AT-RASC), May 18-22, 2015, to be held in the ExpoMeloneras Convention Centre, Gran Canaria, Spain.
- Asia-Pacific Radio Science Conference (AP-RASC), August 21-25, 2016, to be held in the Convention Center, Seoul, South Korea.
- URSI General Assembly and Scientific Symposium, Montreal, Canada, to be held in 2017.

7. Report and Comments on the Scientific Program of the Commission for the Current GASS

Commission E offered 16 sessions at the URSI GASS in Beijing (2014). In addition, there were five more sessions co-organized with other Commissions. They were all well attended and, generally speaking, there were several lively discussions following the presentations.

In the URSI Questionnaire for Participants of the URSI GASS in Istanbul (2011), 22 (8.4%) of the 261 respondents chose Commission E as the Commission that best met their needs. Also, 51 (9.1%) of the respondents from the 2011 GASS said they attended Commission E sessions. We wish to get similar results if such a questionnaire was available at the GASS in Beijing.

8. Proposed Sessions for the Next GASS

Referring to the sessions listed under item 9 below, the planned sessions for the URSI GASS in Montreal 2017 are expected to be very similar. There is the possibility of adding some more special sessions on current topics.

9. Proposed Sessions for the AT-RASC

At the time of writing this report (February 12, 2015), the sessions planned at AT-RASC are as follows:

- E.1 Communication in the Presence of Noise
- E.2 Crosstalk
- E.3 Electromagnetic Compatibility Education
- E.4 Electromagnetic Compatibility Measurements and Standards
- E.5 Electromagnetic Noise of Natural Origin

- E.6 Electromagnetic Radiation Hazards
- E.7 High-Power Effects of Transients on Electronic Systems
- E.8 Spectrum Management and Utilization
- E.9 Other
- S-EB. High-Power Electromagnetics
- S-EC. Time Reversal in Electromagnetic Environments: Theory and Applications
- S-EF1. Understanding Microwave Processing of Materials
- S-EF2. Statistical Methods in Electromagnetics
- S-EAB. Chaos and Complexity in Electromagnetics
- E.10 Latest Results

We intend to combine papers into technical sessions with five or six papers or 10-12 papers in each session from the submitted papers.

10. Other Business

None.

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COMMISSION F - WAVE PROPAGATION AND REMOTE SENSING

Three business meetings were planned at the URSI GASS 2014 (August 17-23, Beijing, China) by Roger Lang, Chair of Commission F: Monday August 18, 17:40-19:00; Wednesday August 20, 17:40-19:00; Friday August 22, 17:40-19:20. During these business meetings, several topics were discussed by the members of Commission F, as described in the following.

1. Results of Election of Vice Chair

The candidates for Vice Chair for 2014-2017 were T. Tanzi (France) and V. Chandrasker (USA). V. Chandrasker (Colorado State University, Fort Collins, CO 80523 USA; e-mail: chandra@engr.colostate.edu) was elected Vice Chair.

2. Results of Election of Early Career Representative

The candidates were S. Das (India), D. Swain (India), S. Ambroziak (Poland), and M. Kurum (Turkey). M. Kurum (TUBITAK-BILGEM, Information Technologies Institute, Gebze, Kocaeli, PK: 74, 41470 - Turkey; e-mail: mehkurum@hotmail.com) was elected ERC.

3. Appointment of Associate Editor for *Radio Science Bulletin*

The past Associate Editor was Simonetta Paloscia (Vice Chair 2011-2014), who handled the review of a couple of papers for publication in the *Radio Science Bulletin*. The new Associate Editor for the *Radio Science Bulletin* is now V. Chandra, assisted by M. Kurum.

4. Updates/Status of Working Groups

The existing working groups of Commission F are the following:

4.1 Working Group on Mitigation of Ionospheric and Tropospheric Effects on GNSS
Chair: Bertram Arbesser-Rastburg

A short report is provided on the activities of Joint Working Group FG “Atmospheric Remote Sensing Using Satellite Navigation Systems” for the 2014-2017 triennium. The Co-Chair for Commission F is B. Arbesser-Rastburg (Netherlands); the Co-Chair for Commission G is C. Mitchell (United Kingdom).

Several scientific symposia with relevant topics have been held in the last URSI triennium under the auspices of URSI:

- ICTRS 2014, 26-27 June 2014 in Luxembourg (Keynote Speaker Francois Lefreuvre)
- The URSI Commission F Triennial Open Symposium, 30 April to 3 May 2013 in Ottawa, CA (Local Chair: Dr. Cesar Amaya) This Symposium covered all scientific areas of interest to URSI Commission F - this includes remote sensing of the troposphere by GNSS signals.
- Three events were directly organized by the Co-Chairs of WG FG:
 - The 3rd International Colloquium on Scientific & Fundamental Aspects of the Galileo Programme: This colloquium was held at the Danish Design Centre in Copenhagen, Denmark, from August 31 to September 2, 2011, and had sessions on the troposphere and ionosphere, with emphasis on topographic retrieval techniques.
 - The 2013 Beacon Satellite Symposium (<http://people.bath.ac.uk/ee3jarr/beaconsatellite2013/>). This symposium, which has a 40-year-long tradition, was organized by URSI Commission G, WG G2: “Studies of the Ionosphere Using Beacon Satellites.” The 2013 edition was held from July 8-12, 2013, in Bath, UK, and the local chair was Prof. Cathryn Mitchell. It attracted over 150 people, and included topics on measurements of ionospheric quantities such as TEC and scintillation index using GNSS signals. It featured seven oral sessions and one poster session. A selection of papers will be published in a special issue of *Radio Science*.
 - The 4th International Colloquium on Scientific & Fundamental Aspects of the Galileo Programme (<http://congrexprojects.com/2013-events/13c15/>). This colloquium was held at the Ministry of Transport in Prague from December 4-6, 2013. It had specific sessions on the ionosphere, the troposphere, and on remote sensing with GNSS signals. The event was attended by 97 participants from 23 countries.

Bertram Arbesser considered it a great honor to be asked to continue to lead URSI Working Group FG. However, realizing that the Matera Workshop was 11 years ago, and considering that he is now retired and no longer on the Dutch National URSI Committee, Bertram suggested giving somebody else an opportunity. In particular, he suggested a person who has the right profile for this task: Nicolas Floury, the head of the Wave Interaction and Propagation Section at ESA, who is an expert in remote sensing and

has an intimate knowledge of ionospheric physics. Moreover, he is the Commission F representative on the Dutch National URSI Committee, and he has experience with organizing workshops. Nicolas was contacted by Simonetta Paloscia, and he accepted with great enthusiasm the role of working group coordinator.

Next generation remote sensing radars (M. Chandra, J. Isnard, T. Tanzi and W. Keydel)

4.2 Next-Generation Remote-Sensing Radars

Co-Chairs: M. Chandra, J. Isnard, T. Tanzi, and W. Keydel

4.3 RFI Working Group

This is a joint working group of Commissions F, G, H, and J. They will hold a two-day meeting at AT-RASC. The organizer is Willem Baan.

5. Updates to the Terms of Reference of the Commission

The focus of Commission F is on wave propagation and remote sensing.

The goal of the Commission is to study wave propagation and remote sensing in a non-ionized environment.

Specific focus areas include:

- Propagation of waves through Earth and planetary atmospheres and wave interaction with Earth and planetary surfaces, including oceans, land, ice and sub-surfaces.
- Wireless propagation in natural and man-made environments.
- Remote sensing of Earth and planetary environments using active and passive techniques.
- Propagation and remote sensing using Global Navigation Satellite Systems (GNSS) and satellite communication links.
- Applications of these studies, particularly to Earth and planetary sciences, climate studies, and communications.

6. Meetings Proposed to be Supported in the Coming Triennium

Past Commission F Meetings were held in Ottawa (URSI Commission F Triennial Open Symposium, April 30-May 3, 2013) and in Helsinki (Microwave Signatures in November 2013).

Coming meetings are

- AT-RASC meeting in Gran Canaria in May 2015 and AP-RASC meeting
- International Symposium on Signals & Systems (ISSS, Commission C Meeting) that was combined with AT-RASC

A proposal for a further meeting on microwave signatures was made by Simonetta Paloscia. This could be organized in France in 2016 by Monique Dechambre, who is the URSI France national representative.

7. Report and Comments on the Scientific Program of the Commission for the Current GASS

The Commission thinks that the scientific program of the current URSI GASS was well articulated and well representative of all fields of wave propagation and remote sensing.

8. Proposed Sessions for the Next GASS

Setting up a scientific program for a triennium is the prime activity of an URSI Commission in order to achieve an exchange of ideas and research results among individual scientists throughout the world. This is carried out at General Assemblies and other meetings. The main goal of URSI is to give opportunities, especially to young scientists, to present their results.

The members of Commission F will consider the list of sessions already organized for URSI GASS 2014, and will focus on a list of future sessions by taking into consideration the new developments in all fields regarding wave propagation and remote sensing in a non-ionized environment.

The Commission encourages:

- a. The study of all frequencies in a non-ionized environment:
 - i. wave propagation through planetary, neutral atmospheres and surfaces;
 - ii. wave interaction with the planetary surfaces (including land, ocean, and ice), and sub-surfaces;
 - iii. characterization of the environment as it affects wave phenomena;

- b. The application of the results of these studies, particularly in the areas of remote sensing and communications;
- c. The appropriate cooperation with other URSI Commissions and other relevant organizations.

To further these objectives, the Commission collaborates with other URSI Commissions and with other concerned organizations and scientific unions.

9. Proposed Sessions for the AT-RASC

The new elected Vice Chair proposed the organization of a session for the AT-RASC meeting on “Atmospheric Propagation: Advanced Concepts in Propagation and Remote Sensing of Precipitation from Earth and Space.”

10. Other Business:

Representatives to Other Organizations

Some members of Commission F are representatives of other international organizations:

- IEEE GRS: Steve Reising
- ISPRS: Callisto Tanzi
- SCOR: Scientific Commission on Ocean Research: Roger Lang
- IUCAF: Scientific Commission on Frequency Allocations: Steve Reising
- CoSPAR: Commission on Space Research: Bertram Arbesser-Rastburg
- ITU: Jean Isnard

Chair: Simonetta Paloscia
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COMMISSION G - IONOSPHERIC RADIO AND PROPAGATION

The Commission G business meetings were held on Monday, August 18, 2014; Wednesday, August 20, 2014 (together with Commission H); and Friday, August 22, 2014.

1. Results of Election of Vice-Chair

At the Monday meeting, Patricia Doherty was elected as the new Commission Vice Chair.

2. Results of Election of Early Career Representative

At the Monday meeting, Seebany Datta-Barua was elected as the Early Career Representative.

3. Appointment of Associate Editor for *Radio Science Bulletin*

The Vice Chair confirmed her willingness to be an Associate Editor of the *Radio Science Bulletin*. John Mathews agreed to assist as History Editor of the *Radio Science Bulletin*. The Chair requested an *RSB* contribution from the tutorial lecturer.

4. Updates/Status of Working Groups

4.1 G1: *Ionosonde Network Advisory Group*

The Chair is I. A. Galkin (USA), the Vice Chair is J. B. Habarulema (RSA), the *INAG Bulletin* Editor is P. Wilkinson (Australia). (Just after the GASS, Prof. Dr. Baigi Ning from Chinese Academy of Sciences Institute of Geophysics became the Vice Chair.)

4.2 G2: *Studies of the Ionosphere Using Beacon Satellites*

The Vice Chairs are P. Doherty (USA) with another Vice Chair to be determined, and the Honorary Chair is R. Leitinger (Austria).

4.3 G3: Incoherent Scatter Working Group

The Chair is M. McCready (USA), and the Vice Chair is I. McCrea (UK).

4.4 URSI/COSPAR on International Reference Ionosphere (IRI)

The Chair is David Altadill (Spain), the Vice Chair for COSPAR is Shigeto Watanabe (Japan), the Vice Chair for URSI is Vladimir Truhlik (Czech Republic), and the Secretary is Dieter Bilitza (USA).

4.5 Inter-Commission Working Groups

4.5.1 GF: Middle Atmosphere

The acting Co-Chairs for Commission G are Jorge L. Chau and Erhan Kudeki. There is no Co-Chair for Commission F.

4.5.2 GH: Active Experiments in Space Plasmas

The Co-Chair for Commission G is Todd R. Pedersen, and the Co-Chair for Commission H is M. Kosch.

4.5.3 EGH: Seismo-Electromagnetics (Lithosphere-Atmosphere-Ionosphere Coupling) The Chairs are Y. Hobara (E), S. Pulnits (G), and H. Rothkaehl (H).

Different kinds of electromagnetic precursors have been accumulated during the last few decades. In particular, geoelectric signals, ULF (ultra-low-frequency) and ELF (extremely low-frequency) electromagnetic emissions are the direct signatures of seismic activity. There have also been observed perturbations in the atmosphere and ionosphere in possible association with earthquakes. The final goal is to understand different kinds of electromagnetic phenomena in the context of lithosphere-atmosphere-ionosphere coupling.

4.5.4 JHG: Inter-Commission Working Group on Characterization and Mitigation of Radio Interference

The Chairs are Terry Buller (G), Willem Baan (J), and Hanna Rothkaehl (H).

Motivation: Increased commercial and public use of the radio spectrum increasingly affect the scientific use of the spectrum, which is of concern for all URSI Commissions using direct spectral measurements. The higher sensitivity of the scientific

detection systems and the observations outside allocated bands will further increase the vulnerability of scientific observations in the rapidly changing spectrum environment.

The presence of interference in scientific data requires the implementation of active mitigation measures to reduce the effects on the measurements. Different science applications and different spectral characteristics of the interference require a variety of mitigation schemes and methodologies.

Purpose: The purpose of the Inter-Commission Working Group (ICWG) is to utilize the interdisciplinary nature of the URSI Commissions in dealing with interference issues, and to capitalize on the different experiences of each of the disciplines. An ICWG will facilitate the discussion of spectral characteristics of interference and applicable mitigation methodologies in order to find new and improved solutions for interference problems. In particular, the interference-rejection experience of commercial usage may provide lessons for the passive users of the spectrum. Exchanging experiences and learning from each other will be a primary objective of the ICWG.

ICWG activities: The ICWG will be used to identify active players in RFI issues in the various URSI Commissions, and to establish a network for exchanging ideas and experience. In addition, dedicated sessions will be facilitated at future URSI meetings, starting with AT-RASC 2015.

4.5.5 Inter-Commission Working Group on Solar Power Satellites

The Chair is Prof. H. Matsumoto (Japan), the Co-Chairs for Commission E are Z. Kawasaki (Japan) and J. Gavan (Israel), the Co-Chair for Commission H is K. Hashimoto (Japan), and the Co-Chair for Commission G is K. Schlegel (Germany).

4.5.6 URSI/IAGA VLF/ELF Remote Sensing of the Ionospheric and Magnetosphere (VERSIM)

The Co-Chair for IAGA Commissions 2 and 3 is C. J. Rodger (New Zealand), the Co-Chair for URSI Commission H is J. Lichtenberger (Hungary), the Co-Chair for URSI Commission G is to be determined.

5. Updates to the Terms of Reference of the Commission

New terms of reference were widely discussed (including discussion on the Internet). The following were agreed to and later ratified by Council.

Commission G on Ionospheric Radio and Propagation (including ionospheric communications and remote sensing of ionized media).

The goal of the Commission is to study the ionosphere and provide its broad understanding to support the use of radio by society on Earth and in space.

Specific areas of focus include:

- Observation of ionospheric structure, variability, coupling, and trends at all relevant scales.
- Modeling of the ionosphere to enable understanding and prediction of its properties.
- Development of the tools, techniques, and instruments necessary to measure ionospheric properties.
- Theory and practice of ionospheric radio propagation and scattering.
- Applications to radio systems, global navigation, communications, space weather, and situations of global concern.

To further these objectives, the Commission collaborates within URSI and with other concerned organizations and scientific unions.

6. Meetings Proposed to be Supported in the Coming Triennium

None provided.

7. Report and Comments on the Scientific Program of the Commission for the Current GASS

None provided.

8. Proposed Sessions for the Next GASS

8.1 “Modeling Geospace Environment”

Conveners: A. A. Namgaladze, e-mail: namgaladzeaa@mstu.edu.ru; M. Foerster, e-mail: mfo@gfz-potsdam.de; O. Martynenko, e-mail: Oleg.Marttinen@google.com.

Abstract

This session will be devoted to the latest achievements in the area of modeling the system consisting of the Earth’s atmosphere, ionosphere, plasmasphere, and magnetosphere, including its electrodynamics. The coupling processes of interactions between various regions of the geospace environment will be considered using modern

first-principle physical-numerical models. The problems of the inputs and initial and boundary conditions of the models will be discussed, as well as results of their validation via comparisons among the models and both ground-based and satellite observations. This session will foster collaboration among modelers, data providers, and research communities in order to improve mutual understanding and state-of-the-art data analyses of geospace missions.

8.2 HGE: “Atmospheric, Ionospheric, Magnetospheric and High-Energy Effects of Lightning Discharges”

Conveners: Sebastien Celestin (H), e-mail: sebastien.celestin@cnrs-orleans.fr; Ningyu Liu (G), e-mail: nliu@fit.edu; Martin Fullekrug (E), e-mail: M.Fullekrug@bath.ac.uk.

Abstract

The recent discovery that lightning discharges can cause energetic radiation, relativistic particles, and transient luminous events has marked a profound advance in our understanding of the Earth’s atmospheric electrodynamic behavior. This session will explore these novel processes and their impact on the atmosphere and the near-Earth environment. The session solicits contributions that advance knowledge in the areas of the global atmospheric electric circuit, lightning physics, transient luminous events, energetic radiation, relativistic particles, and their impact on the Earth’s atmosphere, ionosphere, and magnetosphere. One key focus of the session will be novel observations onboard space platforms, such as the lightning imagers on geostationary satellites, the TARANIS satellite, the ASIM payload on the International Space Station, and related ground-based observations and their modeling. Interdisciplinary studies that emphasize the connection between atmospheric layers and the relationship between atmospheric electricity and climate change are particularly welcome.

8.3 Other Proposed Sessions

“Assimilative Modeling and Global Ionosphere Observations”

Chairs: Ivan Galkin and Dieter Bilitza (G)

“Transient Ionospheric Phenomena”

Chairs: John Mathews (G) and TBD (H)

“Plasmo/iono Weather Applications”

Chairs: Matthew Angling and TBD (G)

“Beacon Satellites”

Chairs: Patricia Doherty and TBD (G)

“Plasma Instabilities and Irregularities”

Chairs: Frank Lind (G) and Robert Pfaff (H)

“Algorithms and Methods”

Chairs: Sean Elvidge and TBD (G)

“Modeling Geospace Environment”

Chair: A. A. Namgaladze, M. Foerster (G), O. Martynenko

“Active Experiments”

Chair: Natasha Jackson-Booth (G), and V. Sonwalkar and Robert Moore (H)

“Latest Results”

Chairs: IS, PD, JM (G) (presentations about 10 min)

“Inter-Commission Working Group on Characterization and Mitigation of Radio Interference”

Proposed by Commission J to E, F, G, and H

Chairs: Terry Bullet (G), Willem Baan (J), Hanna Rothkaehl (H)

“Inter-Commission Working Group on Seismo-Electromagnetics (Lithosphere-Atmosphere-Ionosphere Coupling)”

Proposed by Commissions E, G, and H

Chairs: Y. Hobara (E), S. Pulinets (G), H. Rothkaehl (H)

“Ionospheric, Magnetospheric and High Energy Effects of Lightning”

Chairs: V. Pasko (G), S. Celestin (H), M. Fullekrug (E)

The final list of the sessions will be presented during AT-RASC 2015.

8.4 Commission G Tutorial for the 2017 GASS

Timothy J. Fuller-Rowell will give a tutorial at the next GASS, title to be confirmed.

9. Proposed Sessions for the AT-RASC

We invite you to submit papers (500 words) for this meeting. The deadline for submission of papers is December 15, 2014.

10. Other Business

10.1 Commission G Memberships

An update of the list of Commission G Representatives was identified.

10.2 Other issues

The number of submitted papers and author attendance at the 2014 GASS have to be encouraged, particularly poster papers.

For the next meeting, poster papers should be submitted on topics relevant to each session, and properly marked.

Initiatives to improve URSI meeting attendance and session leadership amongst young scientists were discussed.

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Vice Chair: Patricia H. Doherty
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Early Career Representative: Seebany Datta-Barua
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COMMISSION H - WAVES IN PLASMAS

Commission H business meetings were held three times during the 2014 URSI GASS in Beijing. The first business meeting, chaired by Ondřej Santolík, was held on Monday, August 18, 2014. The second business meeting was organized as a joint meeting of Commissions G and H on Wednesday, August 20, 2014. It was jointly chaired by John Mathews and Ondřej Santolík. The last Commission H business meeting was held on Friday, August 22, 2014. It was again chaired by Ondřej Santolík.

1. Results of Election of Vice Chair

János Lichtenberger (Hungary) was appointed as the new Vice Chair of Commission H after voting from the member committees by mail-in ballots and during the first Commission H business meeting on August 18, 2014. The results were approved by the URSI Council on August 19.

The former Vice Chair, Meers Oppenheim (USA), who was elected in 2011, was unfortunately unable to serve as Chair in 2014-2017 for serious personal reasons. In this exceptional situation, the URSI Board and the Commission H business meeting held on August 18, 2014, approved the continuation of the term of Ondřej Santolík (Czech Republic) as Chair of Commission H until the end of the next General Assembly. He will share these responsibilities with the newly elected Vice Chair and Early Career Representative. He will also seek advice from the Commission H past Chair, Yoshi Omura (Japan), whose continuing help is gratefully acknowledged.

2. Results of Election of Early Career Representative

Wen Li (USA) was appointed as the new Early Career Representative (ECR) of Commission H, after voting from the member committees by mail-in ballots and during the first Commission H business meeting held on August 18, 2014. The results were approved by the URSI Council on August 19.

3. Appointment of Associate Editors for Radio Science Bulletin

The Commission H Vice Chair, János Lichtenberger, and the Commission H ECR, Wen Li, agreed to become Associate Editors of the *Radio Science Bulletin*.

4. Updates/Status of Working Groups

Activities of the working groups related to Commission H were reviewed, and their organization was renewed.

Inter-Commission Working Group EGH on Seismo-Electromagnetics was renewed, with Y. Hobara serving as co-Chair for Commission E, S. Pulinets serving as co-Chair for Commission G, and H. Rothkaehl serving as co-Chair for Commission H.

Inter-Commission Working Group GH on Active Experiments in Space Plasmas was renewed, with T. R. Pedersen serving as co-Chair for Commission G, and M. Kosch serving as co-Chair for Commission H.

The Inter-Union Working Group VERSIM (VLF/ELF Remote Sensing of Ionosphere and Magnetosphere) was renewed as an URSI/IAGA Joint Working Group, with the involvement of URSI Commissions E, G, and H, and with URSI co-Chair M. Clilverd and IAGA co-Chair J. Bortnik

The Inter-Commission Working Group on Solar Power Satellites was renewed, with K. Hashimoto serving as co-Chair for Commission H.

The Inter-Commission Working Group HJ on Computer Simulations in Space Plasmas was renewed, with Y. Omura and B. Lembège serving as co-Chairs for Commission H, and K. Shibata serving as co-Chair for Commission J.

A new Inter-Commission Working Group EFGHJ on Characterization and Mitigation of Radio Interference was established, with H. Rothkaehl serving as co-Chair for Commission H.

5. Updates to the Terms of Reference of the Commission

The terms of reference of Commission H were reviewed, and no changes were proposed.

6. Meetings Proposed to be Supported in the Coming Triennium

Geospace Revisited, September 15-20, 2014, Rhodes, Greece

7th VERSIM Workshop, Hermanus, South Africa, September 2016.

Further suggestions will be handled by Commission H Chair O. Santolík during the three-year period. However, new URSI rules for the Commission budgets do not leave space for supporting all meetings linked to URSI Commission H activities.

7. Report and Comments on the Scientific Program of the Commission for the current GASS

Ample discussion on the organization of the current GASS was held during the last Commission H business meeting on Friday, August 22, 2014. The scientific program of the Commission was found to be successfully prepared, with nine sessions led by Commission H ($6 \times H$, HGE, $2 \times HG$), where 128 papers were presented (91 oral presentations and 37 posters). There were five sessions with Commission H participation (EGH, $3 \times GH$, GHE), where 34 oral talks were presented. The total number of 162

Commission H related papers was nearly the same as the comparable number of 164 Commission H related papers presented during the last 2011 GASS in Istanbul.

The discussion further showed that the online program that was technically managed by the URSI Secretariat was very useful, and should stay online as a record for future reference. The need for a functional Wi-Fi connection at the meeting place was emphasized in this context. The topology of the posters in a “chevron” geometry (∧∧) was found to be an unfortunate solution, to be avoided for future meetings. A shorter delay between the abstract submission and the meeting is required. Preferences for a shorter and more-attractive opening ceremony, as well as for a readable program, and for a reasonable size of the general lecture room, were expressed. However, the GASS was generally considered an overall success.

8. Proposed Sessions for the Next GASS

The following sessions were proposed:

An H session on “Macro/Micro-Scale Kinetic Processes at Natural Boundary Layers in Terrestrial and Planetary Environments,” proposed by B. Lembège, I. Shinohara, and G. Lakhina

An H session on “Remote Sensing and Modeling of the Earth’s Plasmasphere and Plasmopause,” proposed by B. Heilig, A. Jorgensen, and V. Pierrard

An H session on “Wave-Particle Interactions and Their Effects on Planetary Radiation Belts,” proposed by R. B. Horne, C. A. Kletzing, and D. Shklyar

An H session on “Drivers, Detection, and Ionospheric Impacts of Precipitation from the Radiation Belts,” proposed by C. Rodger and M. Clilverd

An H session on “Laboratory Simulations,” proposed by A. Fredriksen

An HG or GH session on “Active Experiments and Radio Sounding,” proposed by V. Sonwalkar, R. Moore (H), and N. Jackson-Booth (G)

An HGE session on “Atmospheric, Ionospheric, Magnetospheric and High-Energy Effects of Lightning Discharges,” proposed by S. Celestin (H), N. Liu (G), and M. Fullekrug (E)

An EGH session on “Seismo Electromagnetics (Lithosphere-Atmosphere-Ionosphere Coupling),” proposed by Y. Hobara (E), S. Pulnits (G), and H. Rothkaehl (H)

A GH session on “Transient Phenomena,” proposed by J. Mathews

GH session on Plasma instabilities and irregularities, proposed by F. Lind, and R. Pfaff (H)

A JFGH session on “Characterization and Mitigation of Radio Interference,” proposed by H. Rothkaehl, W. Baan, and J. Matthews.

9. Proposed Sessions for the AT-RASC

General topics:

- H.1 “Chaos and Turbulence in Plasma”
- H.2 “Plasma Instabilities and Wave Propagation”
- H.3 “Spacecraft-Plasma Interactions”
- H.4 “Solar/Planetary Plasma Interactions”
- H.5 “Wave-Wave and Wave-Particle Interactions”
- H.6 “Waves in Laboratory Plasmas”
- H.7 “Other”

H “Special Session on Space Radio Weather: The Radio Subdomain of Space Weather,” proposed by M. Messerotti and V. Pierrard

HG “Special Session on Highly-Transient Space Plasma Events,” proposed by G. Ganguli, C. Hartzell, and J. Mathews

GH “Special Session on Modeling Geospace Boundaries and the need for Radio Science Observations,” proposed by T. Fuller-Rowell

10. Other Business

A discussion on the implementation of Commission awards for excellent poster papers at the next GASS was initiated.

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János Lichtenberger
URSI Commission H Vice-Chair, 2014-2017
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Wen Li
URSI Commission H Early Career Representative, 2014-2017
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COMMISSION J - RADIO ASTRONOMY

1. Results of Election of Vice Chair

Dr. Richard Bradley (NRAO, USA) was elected as Vice Chair for the coming cycle.

2. Results of Election of Early Career Representative

The votes for the two ERC candidates showed a minimal difference. Considering that in the future there should be two ERC members on a two times three-year rotation, Commission J decided to retain both candidates. Dr. Stefan Wijnholds (ASTRON, NL) was appointed for a six-year term, and Dr. Andrew Siemion (UC Berkeley, USA) was appointed for a three-year term (with travel support as available).

3. Appointment of Associate Editor for Radio Science Bulletin

Dr. Jaap Baars (Germany) will remain Associate Editor of the RSB for Commission J. He will be supported in this activity by the ECRs.

4. Updates/Status of Working Groups

A proposal was made by Kenneth Kellermann and Richard Schilizzi to establish a Commission J Working Group on the “History of Radio Astronomy.” While this is a clear Commission J subject, this working group will be jointly organized with the IAU Working Group on Historical Astronomy. An organizational meeting will be planned during the IAU GA in 2015.

An inter-Commission Working Group with Commissions E, F, G, H, and J on “Characterization and Mitigation of Radio Interference” was proposed by Willem Baan, and this has been agreed upon by the other Commissions. An inter-Commission working group would bundle the individual activities of the various Commissions by means of regular workshops at the URSI meetings. This allows for learning from the experience of others, and for solving interference problems together. Plans are being made to have the first of such workshops during the AT-RASC.

5. Updates to Terms of Reference of Commission

No changes were made in the TOR of Commission J.

6. Meetings Proposed to be Supported in the Coming Triennium

No proposals were discussed for the support of meetings.

7. Report/Comments on the Scientific Program of the Commission for the Current GASS

Part of the attractiveness of URSI lies with the (potential of) cross-fertilization between Commissions. It is therefore regrettable that there were so few inter-Commission sessions at this URSI GASS. Commission J should strive to have more coordination between Commissions (inter-Commission sessions).

There should be more flexibility in assigning timeslots during some sessions, in particular for the Commission J standard sessions on “Observatory Reports” and “Latest Results.”

8. Proposed Sessions for the Next GASS

- A session on mm/sub-mm VLBI
- A session on radar reflections from solar system bodies
- A session on real-time processing systems, with Commission C
- A session on characterization of the ionosphere, with Commission G
- An URSI-wide session on data (archiving/accessibility) (together with the CODATA initiative or big ICT companies?)

9. Proposed Sessions for the AT-RASC

Some of the above proposals will be implemented during AT-RASC.

10. Other Business

None.

COMMISSION K - ELECTROMAGNETICS IN BIOLOGY & MEDICINE

1. Results of Election of Vice Chair

During the 2014 GASS, the candidates for Commission K Vice Chair were Samyoung Chung (South Korea) and Gianluca Lazzi (USA). Dr. Samyoung Chung was elected as Vice Chair of URSI Commission K. He works for the National Radio Research Agency in the Ministry of Science, ICT, and Future Planning in South Korea as an Acting Director. He is in charge of the EMF exposure regulation and measurement methods. Since 2008, he has been involved in the ITU-T SG5 as a Vice Chair.

2. Results of Election of Early Career Representative

During the 2014 GASS, the candidates for the Early Career Representative (ECR) were Puyan Mojabi (Canada), Heba Ahmed Shaban (Egypt), Martin O'Halloran (Ireland), and Sachiko Yamaguchi-Sekino (Japan). Dr. Puyan Mojabi was elected as ECR for URSI Commission K. He is an Assistant Professor in the Department of Electrical and Computer Engineering at the University of Manitoba, Winnipeg, Manitoba, Canada. His current research interests include microwave biomedical imaging, electromagnetic field measurements, and environmental remote sensing.

3. Appointment of Associate Editor for *Radio Science Bulletin*

During the URSI GASS 2014 Beijing, Dr. Puyan Mojabi was elected as an Associate Editor for the *Radio Science Bulletin*. Puyan also serves as an Early Career Representative of Commission K.

4. Updates/Status of Working Groups

During the URSI GASS 2014 Beijing, URSI Commission K decided to create a working group dedicated to "Stochastic Modeling for Exposure Assessment." The conveners of this working group are Joe Wiart (France) (wiart@telecom-paristech.fr), and Tongning Wu, China (CIE) (wutongning@emcite.com).

5. Updates to Terms of Reference of Commission K

The last revision of the terms reference of Commission K was in 2008, during the GASS in Chicago in 2008. During the URSI GASS 2014, it was decided to keep the terms reference of Commission K as they were.

6. Meetings Proposed to be Supported in the Coming Triennium

In the coming triennium, it was decided during the Commission K business meeting to support a meeting in Ghent (around BioEM 2016 in Belgium).

7. Report and Comments on the Scientific Program of the Commission for the Current GASS

10 regular sessions were organized during the GASS. In addition to these sessions, one common session with AE (KAE), two with B (KB), two with B and E (KBE), one with E (KE), and one with C and D (CDK) were organized. These sessions showed a relative decrease of research dedicated to the sanitary impact of RF emitted by mobile phones, even if the dosimetry dedicated to compliance tests or epidemiological studies is still an important domain. The sessions have shown the importance of potential application of radio science in medical applications. The discussions during the sessions demonstrated the importance of uncertainty management, and led to a session working group dedicated to “Stochastic Modeling for Exposure Assessment” being proposed. The seven common sessions over the 17 also showed the importance of common work with other URSI Commissions.

8. Proposed Sessions for the Next GASS

The sessions that will be organized for the next GASS will have to take into account the importance of joint sessions. However, no specific sessions have been proposed for the next GASS, since the discussion was mainly on the proposed sessions in AT-RASC.

9. Proposed Sessions for the AT-RASC

The AT-RASC symposium was intensively discussed during the Commission K business meeting. On the one hand, it is a new symposium that is in competition with

others, even if the URSI framework gives to AT-RASC a good opportunity to share interdisciplinary work. AT-RASC is “open,” so no regular sessions have been proposed, since they are not relevant. Since RF exposure and uncertainty management are important topics, it was decided during the Commission K business meeting to support and propose two special sessions on these aspects.

10. Other Business

None.

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RESOLUTIONS AND RECOMMENDATIONS OF THE COUNCIL

U.1. Membership dues

The URSI Council,

Considering,

1. that the previous Council's decision specifies that Member dues shall be adjusted for inflation each year;
2. that if URSI does not adjust its Member dues to account for inflation each triennium a much larger adjustment may be required in the future;
3. that total inflation in many Member Committees has been in the range of 4% to 5% over the past triennium;
4. that however some Members may have problems obtaining funding for an increase in dues;
5. that it is also prudent to keep any dues increases in accord with those of other scientific unions

resolves

that the URSI Board shall investigate the impact of a dues increase in the range of 5% on the ability of Member Committees to pay the increase, and shall investigate the range of dues increases being instituted by other scientific unions;

and further resolves

that the URSI Board shall be authorized to increase the dues of URSI members by an amount for the next triennium consistent with the results of these investigations.

U.2. Membership Status of Chile

The URSI Council,

Considering,

1. that Chile is currently an Associate Member of URSI;
2. that URSI received a letter from Chile requesting its wish to continue its current status;
3. that URSI would like to continue relations with Chile;

resolves

to maintain Chile as Associate Member of URSI.

U.3. Membership Status of Argentina and Iraq

The URSI Council,

Considering,

1. that Argentina and Iraq are currently Associate Members of URSI;
2. that URSI has not received a response regarding whether Argentina and Iraq wish to continue their current status;
3. that URSI would like to continue relations with Argentina and Iraq, and hopes that they may once again become active in URSI;

resolves

to maintain Argentina and Iraq as Associate Members of URSI.

U.4. Membership Status of Denmark

The URSI Council,

Noting

that the Danish Member Committee has reinstated the payment of its membership dues confirms

and welcomes Denmark back as Member.

U.5. Acceptance of New Members by the Board

The URSI Council,

Considering,

1. That URSI is actively encouraging countries (and especially developing countries) to become Members of URSI;
2. That the URSI Statutes currently permit new Members to be approved into the URSI membership only by action of the Council, which typically meets only every three years, at General Assemblies and Scientific Symposia of URSI;
3. That when a country wishes to become a Member of URSI, it is most beneficial to the country and to URSI for the country to be able to be immediately accepted into membership and become active in URSI affairs;
4. That the requirements for membership in URSI are well defined in the URSI Statutes;

resolves

that the Council authorizes the Board to accept into membership between General Assemblies a country that meets the requirements for membership in the Statutes.

U.6. XXXIInd General Assembly and Scientific Symposium

The URSI Council,

Having considered the invitations for the XXXIInd General Assembly and Scientific Symposium that have been submitted by the URSI Member Committees from Canada (Montreal), and Italy (Rome);

resolves

- a. To accept the invitation of the Canadian URSI Committee to hold the XXXIInd General Assembly in Montreal in August 2017;
- b. To record its thanks to the Member Committees of Canada and Italy for their invitations.

U.7. Vote of thanks to the China (CIE) Member Committee

The URSI Council,

resolves unanimously to convey to the China (CIE) Member Committee its warm thanks and appreciation for the organisation of the XXXIst General Assembly and Scientific Symposium in Beijing.

RÉSOLUTIONS ET RECOMMANDATIONS DU CONSEIL

U.1. Cotisations des membres

Le Conseil de l'URSI,

considérant,

1. que la précédente décision du Conseil précise que les cotisations des membres doivent être réévaluées chaque année en fonction de l'inflation ;
2. que si l'URSI ne réévalue pas les cotisations de ses membres chaque triennat, pour tenir compte de l'inflation, une majoration plus importante sera nécessaire dans le futur ;
3. qu'au total l'inflation, pour une majorité de pays membres, a été comprise entre 4 et 5 % pour le triennat passé ;
4. que cependant certains membres peuvent rencontrer des difficultés pour obtenir les fonds correspondant à l'augmentation de leurs cotisations ;
5. qu'il convient d'être attentif à ce que l'augmentation de cotisations soit conforme à celles des autres unions scientifiques ;

décide

que le Bureau de l'URSI doit se renseigner sur la capacité des pays membres à supporter une augmentation de leurs cotisations de l'ordre de 5% de même que sur le niveau de réévaluation de cotisation effectuée par les autres unions scientifiques ;

et décide en outre

que le Bureau de l'URSI est autorisé à augmenter les cotisations des membres de l'URSI, pour le prochain triennat, d'un montant en accord avec les résultats de ces enquêtes.

U.2. Statut du Chili au sein de l'URSI

Le Conseil de l'URSI,

Considérant,

1. que le Chili est actuellement membre associé de l'URSI ;
2. que l'URSI a reçu du Chili un courrier exprimant son souhait de maintenir son statut actuel ;
3. que l'URSI souhaite poursuivre les relations avec le Chili ;

décide

de maintenir le Chili en tant que membre associé de l'URSI.

U.3. Statut de l'Argentine et de l'Iraq au sein de l'URSI

Le Conseil de l'URSI,

Considérant,

1. que l'Argentine et l'Iraq sont actuellement membres associés de l'URSI ;
2. que l'URSI n'a pas reçu de réponse quant à savoir si l'Argentine et l'Iraq souhaitent maintenir leur statut actuel ;
3. que l'URSI souhaite poursuivre les relations avec l'Argentine et l'Iraq, et espère qu'ils pourront redevenir actifs dans l'URSI ;

décide

de maintenir l'Argentine et l'Iraq en tant que membres associés de l'URSI.

U.4. Statut du Danemark au sein de l'URSI

Le Conseil de l'URSI,

notant

que le Danemark a rétabli le paiement de ses cotisations

confirme

et accueille le Danemark en tant que membre.

U.5. Acceptation de nouveaux membres par le bureau

Le Conseil de l'URSI,

Considérant,

Que l'URSI encourage activement les différents pays (en particulier les pays en voie de développement) à devenir membres de l'URSI ;

Que les statuts actuels de l'URSI ne permettent l'adhésion de nouveaux membres de l'URSI que par une action du Conseil, lequel se réunit généralement tous les trois ans, lors des Assemblées générales et symposia scientifiques de l'URSI ;

Que lorsqu'un pays souhaite devenir membre de l'URSI, il est plus intéressant pour le pays en question et pour l'URSI d'être en mesure d'admettre immédiatement son adhésion afin qu'il puisse devenir actif au sein de l'URSI ;

Que les conditions d'adhésion à l'URSI sont bien définies dans les statuts URSI;

décide

que le Conseil autorise le Bureau à accepter comme membre, entre deux assemblées générales, les pays qui respectent les conditions d'adhésion des Statuts.

U.6. la XXXIIe Assemblée générale et symposia scientifiques

Le Conseil de l'URSI,

Ayant examiné les invitations pour la XXXIe Assemblée générale et symposia scientifiques qui ont été soumises par les Comités membres de l'URSI du Canada (Montréal) et de l'Italie (Rome) ;

décide

- a. d'accepter l'invitation du Comité URSI du Canada à tenir la XXXIIe Assemblée générale à Montréal en août 2017 ;
- b. de renouveler ses remerciements aux Comités Membres du Canada et de l'Italie pour leurs invitations.

U.7. Remerciements au Comité Membre Chinois (CIE) de l'URSI

Le Conseil de l'URSI,

décide à l'unanimité de transmettre au Comité Membre Chinois (CIE) ses vifs remerciements et sa reconnaissance pour l'organisation de la XXXI^e Assemblée générale à Pékin.