USNC-URSI Commission J Monthly e-Newsletter
November 2014

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News Items
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Just a reminder ... there will be NO URSI National Radio Science Meeting in Boulder this coming January! We are finally back to the normal cycle of skipping the Boulder meeting during the years when the North American Radio Science meeting convenes. The next Boulder meeting will take place in January 2016.

URSI International is planning a new triennial conference. The URSI Atlantic Radio Science Conference will take place at the ExpoMeloneras Convention Centre, Gran Canaria, Canary Islands May 18-22, 2015. Commission J will hold sessions at this event. The abstract deadline is December 15th, 2014! For more information see the Upcoming Meetings and Conferences section of the Newsletter.

The USNC/CNC - URSI North American Radio Science Meeting (NARSM) will be held on July 19-25, 2015 in Vancouver, BC Canada in conjunction with the IEEE International Symposium on Antennas and Propogation. The paper submission deadline is January 15, 2015! For more information see the Upcoming Meetings and Conferences section of the Newsletter.

Links to the Radio Science Bulletin (RSB) are given below. Several very interesting articles have appeared there over the past several months including one by Jaap Baars on the history of flux density calibration. Please consider contributing an article to RSB - details are given below. I am currently writing an article about project PAPER.

On a personal note, I have been remiss in publishing the USNC-URSI-J Newsletter over the past several months (since March!) and for this I sincerely apologize. I also wish to express my sincere thanks to Ken Kellermann who represented USNC-URSI-J at the URSI GASS this summer in my absence. While my tenure as Chair of USNC-URSI-J comes to a close next month, I am grateful to have been elected Vice-Chair of URSI International Commission J so that I may continue to serve our fine organization. Thank you for your support.

Please consider nominating candidates for membership in Commission J. Details are given at the end of this Newsletter.

A PDF version of the USNC-URSI-J Newsletter is available in the archive at our website at http://www.nrao.edu/usnc-ursi-j/

Contributions of newsworthy items that are of interest to the membership are always welcome.

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Radio Science Bulletin
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The March 2014 issue (No. 348) of the URSI Radio Science Bulletin is now available on the URSI Web site for downloading in PDF format. It can be downloaded from the following location: http://www.ursi.org/files/RSBissues/RSB_348_2014_03.pdf

The winners of the 2014 URSI awards are announced in this issue.

The second part of a two-part series that was begun in the June 2013 issue of the Radio Science Bulletin (No. 345) appears in this issue on "The Role of Radio Science in Disaster Management." The Guest Editors for this special section are Tullio Joseph Tanzi, François Lefèuvre, and Phil Wilkinson.

In their invited paper, Liangpei Zhang and Bin Luo look at recent technologies for disaster management in China (CIE). The emphasis is on the use of remote-sensing data in disasters, and particularly the data available from four Chinese remote-sensing satellites dedicated to disaster management. The article looks at how such data are used in typical natural disasters in China, including earthquakes, landslides, and floods.
In their invited paper, Tullio Joseph Tanzi, Olivier Sebastien, and Fanilo Harivelo present a proposal for integrating the now-ubiquitous smart phones into various aspects of risk management. The authors provide an overview of the various aspects of risk management, and the roles played by radio communications in a crisis. They point out the potential advantages to be gained from exploiting direct links with the population. They look at how smart phones could be used for data reporting and as sensors in a disaster, and at the various communication and networking aspects of such use. They also review a number of existing smart-phone applications dedicated to various aspects of risk.

The topic of the invited paper by François Lefeuvre and Tullio Joseph Tanzi is the role of radio science in the first two weeks after a disaster: the "response phase" of a crisis. The various types of radio communication, observation, and navigation services are reviewed. The factors that can affect these due to variations in the space environment are summarized. The importance and roles of mobile ad-hoc networks in a crisis are explained. The various types of data-acquisition techniques that can be valuable in a disaster are cataloged, including techniques for space-based, aerial, and ground-based data. The methods of making use of such data for emergency management are discussed.

The contributed paper by Jacob W. M. Baars combines excellent radio science, a good detective story, and fascinating history to provide very interesting reading. He has provided us with an account of the developments in flux-density calibration for radio-astronomy sources, spanning more than 50 years. The need for an absolute measurement of the flux density from a radio source is explained using a simple optical example. The use of a calibration source is introduced. The nature and importance of the variation with time and frequency of the flux-density output of the major astronomical calibration sources is explained in detail. This is followed by the fascinating story of the history of how an absolute flux-density scale was developed, step-by-step, through the work of many groups around the world. This involved improvements in source spectra, gain calibration, extensions in frequency range, extensions to sources of different strengths, and the development of secondary calibration sources. All of this makes for fascinating reading.

In his Radio-Frequency Radiation Safety and Health column, Jim Lin analyses the possible effects of a recently discovered issue related to the way studies have been done on the exposure of cell cultures to static and low-frequency electromagnetic fields. Kristian Schlegel has brought us reviews of two interesting books. We have reports on several conferences of interest to radio scientists: the 2013 Asia-Pacific Radio Science Conference (AP-RASC 2013), the Indian Regional Conference in Radio Science (RCRS2014), and the sixth workshop of the URSI/IAGA Joint Working Group on VLF/ELF Remote Sensing of the Ionosphere and Magnetosphere (VERSIM). We also sadly have "in memoriam" pieces on three radio scientists who have been lost to our field.

Contributed by Ross Stone

The June 2014 issue (No. 349) of the URSI Radio Science Bulletin is now available on the URSI Web site for downloading in PDF format. It can be downloaded from the following location: http://www.ursi.org/files/RSBissues/RSB_349_2014_06.pdf

The 2013 Asia-Pacific Radio Science Conference (AP-RASC 2013) was held in Taipei, Taiwan, during September 3-7, 2013. This issue contains four papers from the winners of that competition in a special section. From the introduction provided by the guest editors of the special section, the paper authored by Lee et al. discusses wave generation via the cyclotron maser instability by an electron ring distribution, and the associated electron acceleration by the excited Z-mode and whistler-mode waves. The paper by Cheng et al. focuses on the problem of physical layer authentication in communications, aimed at assuring that the current transmission comes from the same entity as the previous transmission. Kohmu et al.'s paper presents a new design for an electro-optic modulator, utilizing an antenna-coupled-electrode array and polarization-reversed structures to achieve higher efficiency in optical modulation. The paper by Wang et al. proposes a numerical homogenization method to extract the equivalent electromagnetic parameters of ferromagnetic nanowires.

We have an invited paper by Yoshiharu Omura, who will be presenting the Commission H tutorial lecture at the XXXIth URSI General Assembly and Scientific Symposium in Beijing. His paper is based on that lecture, and deals with the state of our current understanding of nonlinear wave-particle interactions in planetary radiation belts. Such interactions generate the whistler-mode chorus emissions and electromagnetic ion-cyclotron-triggered emissions that have been observed in recent years. The paper reports on the use of new simulations combined with recent observations to provide new insight into the understanding of these phenomena.

C. J. Rodger, M. A. Clilverd, W. Li, M. P. McCarthy, Y. Omura, and C. E. Weaver have provided us with a paper intended to stimulate interest in two Commission H sessions at the URSI GASS in Beijing. The
paper deals with energetic electron precipitation from the Van Allen radiation belts around the Earth. This paper provides a nice introduction to the topic, and a very nice background for the related sessions at the GASS.

Kristian Schlegel has brought us another book review, of a book on reconfigurable antennas. This issue contains the triennial reports from URSI Commissions A, B, D, F, and H. We have reports on a couple of URSI-sponsored conferences, and, sadly, an in memoriam article on Karl Langenberg, who recently passed away. We also have an article on the recipient of the 2014 URSI France medal.

Contributed by Ross Stone

If you would like to contribute an article to the Radio Science Bulletin please contact Associate Editor Jaap Baars (jaapbaars@arcor.de). Note that all articles that appear in the RSB are subject to peer review prior to publication.

Upcoming Meetings and Conferences

Major URSI Meetings/Conferences Involving Commission J:

The URSI Atlantic Radio Science Conference will take place at the ExpoMeloneras Convention Centre, Gran Canaria, Carany Islands May 18-22, 2015. The the abstract deadline is December 15th, 2014! There are several special sessions planned for Commission J:

- S-JC1 "Realtime data processing"
- S-JC2 "Big data and CO-DATA archives, accessibility, metadata"
- S-JG " Ionospheric models and their validation"
  Organizers and Co-Chairs: Richard Schilizzi, Stefan Wijnholds, John Matthews
- S-JCD "Radio astronomy systems and enabling components"
  Organizer and Co-Chair: Arnold van Ardenne

A general lecture is planned for each day of the conference. These include historical talks such as "What did Maxwell do and how did he do it: An overview of Maxwell's Treatise" given by Arthur Yaghjian, Research Consultant, United States and presentations on interesting physical phenomena such as "Time-reversal physics and innovation" Mathias Fink, Institut Langevin, France.

For more information please see the conference website at http://www.at-rasc.com/home.asp

The 2015 IEEE AP-S Symposium on Antennas and Propagation and URSI CNC/USNC Joint Meeting - Vancouver 2015 will be held on July 19-25, 2015, at the Westin Bayshore Hotel in Vancouver, British Columbia, Canada. The symposium and meeting are co-sponsored by the IEEE Antennas and Propagation Society (AP-S), the all U.S. and Canadian National Committees (USNC/CNC) of the International Union of Radio Science (URSI). The technical sessions, workshops, and short courses will be coordinated between the two groups to provide a comprehensive and well-balanced program. This meeting is intended to provide an international forum for the exchange of information on state-of-the-art research in antennas, propagation, electromagnetic engineering, and radio science.

Special sessions will be selected and finalized by the end of November 2014. At that time, additional instructions will be provided to the organizers of the special sessions chosen for inclusion in the symposium and/or the meeting.

The paper submission deadline is January 16, 2015. For more information, please see the symposium website at http://www.2015apsursi.org/default.asp

Request for Nominations: New Members of Commission J

Please consider nominating someone for membership in USNC-URSI Commission J. Students are encouraged to become involved - they can be nominated for non-voting Associate Membership. This is a 3 year term that can be renewed once for a total of 6 years. Guidelines for membership and the on-line nomination form can be found at http://www.usnc-ursi.org/ under "Membership." The membership will vote on the nominees during the Boulder Commission J Business Meetings.