

**Commission H
2005 – 2008 triennium report**

Richard B. Horne

In Memoriam

The following friends and colleagues passed away during the last three years:

- Roger Gendrin
- Victor Trakhtengerts
- James Van Allen
- William W L Taylor

They made significant contributions to the science supported by Commission H and will be remembered warmly.

Commission H web site

During the last three years the Commission H website has been updated significantly. The web site now contains introductory material and references to Commission H business. I would like to thank the editor, Ondrej Santolik, for all his hard work. The web site can be found at <http://www.ursi.org/H/index.html>.

Meeting Support

Each Commission has a budget for supporting meetings during the triennium. The budget for Commission H was EUR 11,000 which included a carry-over of EUR 2,000 from the last triennium. The Commission received 21 requests for support, and was able to provide financial support for 12 meetings based on scientific relevance, and geographical spread. The following meetings were supported financially with between EUR 500 - 1,500:

- 11th Workshop on the Physics of Dusty Plasmas, Williamsburg, Virginia, USA, 28 June - 1 July 2006
- BG-URSI School and Workshop on Waves and Turbulence Phenomena in Space Plasmas, Bulgaria, 1-9 July 2006
- COSPAR Scientific Assembly, Beijing, China, 16-23 July 2006, in particular session D3.1 on multiscale magnetospheric processes including simulations and theory
- ISROSES - International Symposium on Recent Observations and Simulations of the Sun-Earth System, Varna, Bulgaria, 17-22 September 2006
- 2nd VERSIM Workshop 2006, ELF/VLF Radio Phenomena, Sodankylä, Finland, 26-30 September 2006

- IRI Workshop 2006 - New Measurements for Improved IRI TEC Representation, Buenos Aires, Argentina, 16-20 October 2006
- ISSS8 - 8th International School for Space Simulations, Kauai, Hawaii, USA, 25 Feb - 3 March 2007
- STIINTE - Solar-Terrestrial Interactions : Instrumentation and Techniques, Sinaia, Romania, 4-16 June 2007
- Rarotonga Energetic Particle Workshop 2007, Rarotonga (Cook Islands), 5-10 August 2007
- 10th International VLF Seminar, Zvenigorod, Moscow Region, Russia, 12-15 November 2007
- 3rd VERSIM URSI-IAGA workshop, Tihany, Hungary, 15-20 September 2008
- International Magnetosphere-Ionosphere Coupling Workshop, Espoo, Finland, 28 July 2 August, 2008.

Commission H also provided support in mode A (non financial aid), which means they can use the URSI badge to help promote the meeting, for the following meetings:

- International Symposium on Space THz Technologies, Paris, France, 10-12 May 2006
- Astrophysics in the LOFAR era, Emmen, the Netherlands, 23-27 April 2007
- 12th Microcoll, Budapest, Hungary, 14-16 May 2007
- IRI/COST296 Workshop on Ionosphere Modeling, Forcing and Telecommunications, Prague, Czech Republic, 10-14 July 2007
- International Symposium on Radio Systems and Space Plasma, Borovets, Bulgaria, on 2-5 September 2007
- ICEAA 2007, Torino, Italy, 17-21 September 2007
- STAMMS2 - Spatio-Temporal Analysis of Multimoint Measurements in Space, Orléans, France, 24-28 September 2007
- 12th International Ionospheric Effects Symposium, Alexandria, Virginia, USA, 6-8 May 2008
- 37th COSPAR Scientific Assembly, Montreal, Canada, 13-20 July 2008

Working Group Activities

- **VERSIM.** URSI/IAGA VLF/ELF remote Sensing of the Ionosphere and Magnetosphere (VERSIM) URSI Rep: H. Janos Lichtenberger

The VERSIM working Group has been very active over the last three years. They continue to provide a yearly newsletter to over 100 scientists from 26 Countries. VERSIM have run workshops in 2004, 2006, and 2008. Details of the newsletter, meetings and other information are all online at the webpage

<http://www.physics.otago.ac.nz/versim>

- **HEJ: Supercomputing in Space Radio Science.** Co-chair for Commission H: Y. Omura (Japan)

Plasma simulations are an essential tool for studying waves in plasmas. URSI has been supporting a series of meetings known as the International School for Space Simulations since the 1st meeting in Kyoto in 1982. During the last three years the 8th ISSS meeting was held in Hawaii to train the next generation of space scientists. The next meeting ISSS-9, is scheduled in summer 2009. More information about the meetings and activities can be found on the new web site:

<http://www.iss9.uvsq.fr>

- **EGH: Seismo-Electromagnetics.** Co-chair for Commission H: M Parrot (France)

Since the URSI GA in 2005, the members of the WG have organized several dedicated sessions either in collaboration with EMSEV (Puerto Vallarta, 2005; Agra, 2006) or during international meetings (AGU, 2005, 2006, 2007; EGU, 2006, 2007, 2008). New data coming from the expanding GPS network and from the Earth observation satellites at different wavelengths have been presented. A special International Workshop devoted to the satellite DEMETER was organised in June 2006 in Toulouse. This workshop was attended by 125 geophysicists from 27 countries (including people working in seismology, tectonics, volcanism, EM emissions, ionosphere modelling ...). The DEMETER mission will continue until the end of 2009, and several countries are now proposing to have satellites to follow on from DEMETER.

- **ABDFGHJK: An inter-commission working Groups on Solar Power Satellites:** Co-chair for Commission H: N. Shinohara (Japan),

Work on solar power satellites continues to be an active area of research, particularly in Japan. During the last three years URSI published its first white paper on Solar Power Satellites, in Radio Science Bulletin, June, 2007.

- **GH1 Active experiments in Space Plasmas:** Co-Chair for Commission H: B Thide (Sweden)

Publications

The Vice Chair is responsible for soliciting and editing review papers for the Radio Science Bulletin. Over the last three years Commission H has been the most active of all the commissions and six review papers were published:

- Lembege et al., Kinetic and nonlinear processes in space plasmas, RSB, September 2005
- Decreau et al., The Cluster fleet explores waves in the magnetosphere, RSB, December, 2005

- Koons and Fennel, Space Weather effects on communications satellites, RSB, March, 2006
- Green and Boardson, Kilometric continuum radiation, RSB, September, 2006
- Amatucci, A Review of laboratory investigations of space plasma waves, RSB, December, 2006
- Chaston, Sources for dispersive shear Alfvén waves in the magnetosphere: A Review, RSB, March, 2007

A further four review papers are in progress. Thanks go to the Vice Chair, Yoshi Omura, for all his work in continuing this successful activity for Commission H.

Long Range planning Committee

A meeting of the Long Range Planning Committee was held in Belgium in 2007. The topics discussed included

1. Encouraging new generations of scientists to participate in URSI
2. Identifying new scientific areas
3. Strengthening Commissions that are not very active

A new student paper competition was introduced to address item 1 (see below), and additional money was allocated to each Commission to support non US students attending the GA. To address (2), Commission H identified energy supplies, satellite propulsion (e.g., ion thrusters), protection of satellites (radiation effects on electronics) and power and communications systems (i.e., Space Weather), and solar variability and climate change (e.g., via wave-driven energetic particle precipitation). Use of satellite constellations (small, micro-, nano-) to measure wave properties (temporal and spatial) and plasma wave applications involving other planets and solar physics were also recognized as new opportunities. Furthermore, as energy supplies becomes higher up the political agenda, both the development of nuclear fusion and solar power satellites are seen as possible areas of renewed emphasis, with involvement of several other Commissions (e.g., B, E, F, G, J, and K).

URSI General Assembly, Chicago, 2008

Scientific Sessions

Preparations for the URSI GA are one of the major activities of the Chair and Vice Chair during the triennia. Taking forward the proposals for sessions made at the GA in India, and after negotiations with other Commissions, a number of sessions had to be merged to fit into the new programme. Commission H arranged 10 H led scientific sessions, and contributed to 3 sessions led by other Commissions. 178 papers (82 oral and 96 poster) were accepted for the H led scientific sessions with a further 28 oral, and more than 28 poster papers for the joint sessions led by other commissions. This gives a total (including joint sessions) of 234 papers which compares favourably with

183 papers (89 oral and 94 poster) at the last GA in New Delhi. Overall the number of papers is up.

Session for GA 2008, Chicago	Papers
H1. Dynamics of the plasmasphere using wave techniques	7 oral 5 poster
H2. Observations of waves and coherent structures in space plasmas	10 oral 17 poster
HG1a. Wave particle interactions, and radiation belt remediation	8 oral 11 poster
HG1b. Wave particle interactions and radiation belt remediation	6 oral 11 poster
H3. Open session and latest results	10 oral 6 poster
H4. Kinetic processes at boundary layers	11 oral 8 poster
HG2. Dusty plasmas	6 oral 4 poster
H5. Wave experiments in laboratory plasmas and applications to space	7 oral 4 poster
HGE. Seismo-electromagnetics	10 oral 26 poster
HBDGJK. Solar power satellites	7 oral 4 poster
GHE. Modification of the ionosphere and magnetosphere	7 oral 21 poster
GH. Radio sounding techniques for the ionosphere and magnetosphere	11 oral 7 poster
EGH. Terrestrial and Planetary Electromagnetic disturbances and effects	10 oral
H Tutorial. Wave Acceleration and Loss Processes at the Earth and Planets	1 tutorial
HSR. Special Review, Roger Gendrin	1 oral

Medals and Awards

Every three years URSI calls for nominations for medals and awards to recognise outstanding contributions to URSI science. At this year's GA URSI has announced awards to two scientists that have been closely associated with Commission H:

- Booker Gold Medal to Prof. H. Matsumoto with the citation :*"For his outstanding contributions to the understanding of nonlinear plasma wave processes, promotion of computer simulations in space plasma physics and international leadership in plasma wave research"*.
- Appleton Prize to Prof. U. Inan, with the citation "*For fundamental contributions to understanding of whistler-mode wave-particle interaction in near-Earth space and the electrodynamic coupling between lightning discharges and the upper atmosphere*" (with approval from the Council of the Royal Society)

Congratulations to the recipients, it is good to see their scientific contributions recognised.

Young Scientist Support

For the General Assembly, URSI has a programme of financial support for young scientists. For the 2008 GA in Chicago URSI is supporting 119 young scientists with funds to cover their lodging and also provided a daily allowance. This includes 12 young scientists from Commission H. Five of these young scientists were from developing countries, or East European countries, and received an additional grant from URSI to cover part of their travel.

Student Paper Competition

This year URSI has instigated a student paper competition at the 2008 GA in Chicago to encourage students in all areas of URSI related science. There are five prizes ranging from US\$ 1,500 for first prize down to US\$500 for fifth prize. The entrants must be full-time University students from any country, present a paper at URSI, and submit a full length paper in Radio Science format via the web site at the time of abstract submission. Four student papers were submitted through Commission H from the USA, Czech Republic, Russia and France. After refereeing, one of these papers has been selected for the final round of the competition where the students will present their work just before the GA.

Commission H Student Paper Competition

At the last GA in India 2005, up to US\$ 5,000 was made available to each Commission to support non USA students to attend the GA in Chicago. This was to encourage more students to attend URSI. After discussion, Commission H decided to allocate this money to the best student papers, after the full refereeing round. Commission H was thus able to support four students for travel and subsistence.

Vice Chair Election

The call for nominations for new Vice Chair was sent out in early December 2007. Four excellent candidates have now been nominated and postal voting is in progress. One candidate will be elected at the first Commission H business meeting, which will be held on the first Monday evening of the GA in Chicago.

Finally, I would like to record my thanks to the Vice Chair, Yoshi Omura, to the Commission H National Representatives, and the Working Group Representatives, who have contributed to the success of Commission H over the last 3 years.

Richard B Horne
Chair, Commission H
17 July 2008