



Monthly Newsletter of International URSI Commission J – Radio Astronomy

June 2020

Officers

Chair: Richard Bradley

ECRs: Stefan Wijnholds

Vice-Chair: Douglas Bock

Jacki Gilmore

Prepared by R. Bradley, Chair, Commission J, rbradley@nrao.edu

News Items - Greetings from the Chair!

- **Student Paper Competition (SPC)** – Although the URSI GASS 2020 has been postponed to 2021, the student paper competition (SPC) will be held online. The URSI Board has decided to schedule the SPC finalist presentations sometime during the last week of August. Three short sessions of the ten finalist presentations at different times during the week are planned.
- The Atlantic Radio Science Conference (AT-RASC) will be held in Gran Canaria, Spain, May 30-June 4, 2022, and the Asia-Pacific Radio Science Conference (AP-RASC) will be held in Sydney, Australia, August 20-25, 2022. *Note that AT-RASC and AP-RASC will be held in the same year for 2022, only.* The URSI GASS will be held in Sapporo, Japan, August 19-26, 2023, and thereafter the normal URSI triennial schedule of flagship meetings will be restored.
- URSI and the European Association on Antennas and Propagation (EurAAP) have an MOU that URSI will technically cosponsor the EuCAP meetings. The announcement is given below.
- The December 2019 issue of the *Radio Science Bulletin* was published this month. Additional details are provided in this issue of the Newsletter.
- An online symposium to honor the late pioneer E. Margaret Burbidge will take place on Wednesday, 8 July 2020, 1:00-3:00 pm ET. Please see the announcement in this Newsletter for details.



Announcement for the EUCAP2021 meeting in March 2021

Dear colleagues,

Although we cannot physically in conferences this summer, we should still do some advertisement on EuCAP 2021. I have prepared a slide you can use at the end of presentations you may do –most probably online – in the next couple weeks. The zip-file contains the slide both 4:3 and 16:9 format: https://cloudstorage.tu-braunschweig.de/getlink/fi6iD9XrCv9Rs8JhD9Tb4o5w/EuCAP_2021_PR_Slide.zip.

It would be great, if you could please use it extensively for example at the upcoming AP/S online or the online version of URSI GASS 2020, where I suppose many of you will present a paper.

Thank you very much for your support of EUCAP 2021.

Best regards,

Prof. Dr.-Ing. Thomas Kürner
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Radio Science Bulletin

The December 2019 issues of the *Radio Science Bulletin* was published this month with papers based on presentations from the 2019 URSI Asia-Pacific Radio Science Conference (AP-RASC 2019), held March 10-14, 2019, at the India Habitat Centre, New Delhi, India (the first special issue was September, 2020). This issue contains one of the General Lectures, the keynote presentations from Commissions G and H, and a paper based on one of the Student Paper Competition papers. We also have one regular, non-special issue paper. While all of these papers are based on presentations at AP-RASC 2019, they all were invited on the basis of being significantly extended beyond the conference papers.

We are grateful to Amitava Sen Gupta, Subra Ananthakrishnan, and Kazuya Kobayashi, the guest editors of these special issues, for all of their excellent efforts in bringing these papers to us. They provided a separate introduction to the special issues in the September issue. While all of these papers are based on presentations at AP-RASC 2019, they all were invited on the basis of being significantly extended beyond the conference papers.

In his paper based on his AP-RASC 2019 General Lecture, Yoshiharu Omura provides a summary of the work of his group in recent years on nonlinear wave-particle interactions related to the dynamics of the Earth's outer radiation belt. The main results explained include how whistler-mode rising-tone chorus emissions lead to nonlinear wave trapping. This in turn causes a rapid formation of the relativistic electron flux. Nonlinear interaction with electromagnetic ion-cyclotron rising-tone emissions results in pitch-angle scattering, which precipitates the relativistic electron flux in the outer radiation belt. This paper is a nice follow-on to a previous summary published in the *Radio Science Bulletin*.

The Commission G keynote paper by Archana Bhattacharyya looks at the challenges of predicting low latitude ionospheric scintillations. The paper reviews current and recent past approaches to this prediction problem, noting that most have been based primarily on models involving the linear growth rate of the Rayleigh-Taylor instability. The limitations of such models are explained. The need for high-resolution three-dimensional models of equatorial plasma bubble development under different background conditions is identified, and examples of what can be obtained where such models are available are given.

Abhijit Sen's Commission H keynote paper deals with the nonlinear precursor waves found in front of an object moving at supersonic speed in a plasma. Such waves are relevant to

understanding how the solar wind interacts with the Earth and the moon. They also may be useful in helping to detect charged debris in the ionosphere. This paper describes the nature and properties of such waves as determined through laboratory experiments and a variety of simulations. How these results may be applied to a substantial range of problems is explored.

In their Student Paper Competition paper, Sreenath Reddy Thummaluru and Raghvendra Kumar Chaudhary look at how the radar cross section (RCS) of a multiple-input multiple-output (MIMO) antenna can be reduced. Their approach was to replace the ground plane of the MIMO antenna with a frequency-selective-surface array that was insensitive to angle of incidence. The method presented for carrying out the design is at least as interesting and important as the resulting design itself.

Amy Shockley and Randy Haupt bring us the second in their series on the ethical setting of priorities.

In Giuseppe Pelosi's Historical Corner, Stefano Selleri looks at the history of the Clausius-Mossotti and the Lorentz-Lorenz relations. These relations, deal with fact that the ratio of two polynomials in either the permittivity or the index of refraction of a medium is a constant for a particular medium. The history of these relations involves at least four scientists, and even has controversy surrounding what name should be given to the relations.

Sadly, we have In Memoriam pieces for five very respected radio scientists in this issue: Peter Clarricoats, Iwane Kimura, Alan S. Rodger, Roberto Sorrentino, and Valerian Tatarskii.

In his Telecommunications Health and Safety column, Jim Lin takes a critical look at the US FCC's recent action regarding radiation safety for 5G wireless communications. Specifically, he examines why no changes were made in the current safety limits, and what are some of the implications of that decision.

Asta Pellinen Wannberg has brought us many very interesting contributions from contemporary women radioscientists around the world in her Women in Radio Science column. In this issue, she has the biography of Elizabeth Alexander as given by Dr. Alexander's daughter, Mary Harris. Dr. Alexander's quite significant contributions in two totally disjoint fields spanned a relatively short career, from the mid-1930s through the late 1950s.

Download your copy at [Radio Science Bulletin](#).

From the Radio Science Bulletin "Editors Comments" by Ross Stone

A Celebration of E. Margaret Burbidge

Frank Timmes
Arizona State University

You are invited to join the online symposium to honor the late pioneer E. Margaret Burbidge — the first woman to serve as AAS President (1976-1978) and Inaugural Fellow of the AAS — on Wednesday, 8 July 2020, 1:00-3:00 pm ET. The event will celebrate her life and science through short talks from her colleagues and collaborators as well as researchers who have benefited from her trailblazing and scientific insights.

Speakers include:

George Fuller (University California, San Diego)
Anneila Sargent (California Institute of Technology)
Virginia Trimble (University California, Irvine)
Fred Hamann (University California, Riverside)
Vesa Junkkarinen (University California, San Diego)
Amanda Karakas (Monash University)
Artemis Spyrou (Michigan State University)
Anna Frebel (Massachusetts Institute of Technology)
Nicole Vassh (University of Notre Dame)

Please visit <https://aas.org/posts/news/2020/06/celebration-e-margaret-burbidge> for additional details and Zoom link.

