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INTER-UNION (IAU–URSI) HISTORICAL RADIO ASTRONOMY INTER-DIVISION (B4–C3) WORKING GROUP

CHAIR **Richard Schilizzi (UK)**
VICE-CHAIR **Leonid Gurvits (The Netherlands)**
ORGANIZING COMMITTEE **Past-chair – Richard Wielebinski (Germany)**
Secretary – Kenneth Kellermann (USA)
Web manager – Ellen Bouton (USA)

TRIENNIAL REPORT 2018–2021

1. Purpose of the WG

The WG was first established in 2003 as an IAU Commission 40 WG, and continued as a Joint Commission B4-C3 WG. Since the URSI General Assembly in 2014 it has been a joint WG of the IAU and URSI. Its aims are to

– maintain an ongoing bibliography of publications relevant to the history of radio astronomy,

– document the careers of deceased radio astronomers in biographical memoirs, and

– document and preserve surviving historically-significant radio telescopes and associated instrumentation.

WG has 43 members from 15 countries, amongst whom are 14 national reporters responsible for keeping track of developments of relevance to the WG in their respective countries or regions.

2. Publications and research

2.1. *Publications*

The Master List of Publications in the field of Historical Radio Astronomy can be found on the Working Groups website (https://rahist.nrao.edu) under the heading Resources History of Radio Astronomy.

Table 1 includes five books in the Master List dealing with the history of radio astronomy published since the 2015-2018 report and one that was omitted from the previous report.

The Master List also includes more than 30 articles published in various journals and conference proceedings since the 2015-2018 triennial report.

Presentations on historical radio astronomy topics were given at a number of conferences or in conference sessions in 2018 and 2019, see Table 2.

Table 1. Recent books published on historical radio astronomy

Authors/Editors	Title
Breus, T.K. and Gurvits, L.I. (eds.)	*Intelligence, Life, the Universe: a collection of memoirs on I.S. Shklovsky*, Moscow: Russian Academy of Sciences, (in Russian), 2019
Kellermann, K.I., Bouton, E. N., and Brandt, S.S.	*Open Skies: The National Radio Astronomy Observatory and Its Impact on US Radio Astronomy*, Springer, 2020
Orchiston, W., Robertson, P., and Sullivan, W.T.	*The Golden Years of Australian Radio Astronomy: An Illustrated History*, Springer, 2021
Pariiskii, Yu. N.	*Pages From My Life*, , SPb Publications, (in Russian), 2017
Strom, R., Van Ardenne, A., and Torchinsky, S. (eds.)	*50 Years Westerbork Radio Observatory– A Continuing Journey to Discoveries and Innovations*, (Proceedings of Science (pos.sissa.it) and ASTRON, Dwingeloo, The Netherlands), 2018
van der Kruit, P.C.	*Jan Hendrik Oort – Master of the Galactic System*, Springer, 2019

Table 2. Presentations at conferences or in conference sessions on historical radio astronomy topics in the 2018–2021 triennium

2018	*The history of large single dish projects and lessons learned*, IAU GA, Vienna (8 talks)
	Jas Fest: A Celebration of Jasper Wall at 75, Univ British Colombia, Vancouver (25 talks)
2019	*The History of the Square Kilometre Array, 1980s-2012*, SKAO, Jodrell Bank (49 presentations and 7 discussion sessions)

2.2. *Research projects*

Wayne Orchiston has carried out research into aspects of early Australian, Indian, Japanese and New Zealand radio astronomy, in collaboration with international colleagues, and published a number of articles.

Rebecca Charbonneau (Cambridge University) has been working on the PhD thesis entitled "Mixed Signals: Intelligence and Communication in Cold War Radio Astronomy". Over the reporting period she gave several presentations at relevant colloquia and conferences. Completion of the study is expected in 2021.

Tim Robishaw has contacted relatives of a number of deceased Canadian radio astronomers in a successful attempt to collect archival material from their families. Rooms at the Dominion Radio Astronomy Observatory (DRAO) have been named in honour of three of these former colleagues - Jack L. Locke, Norman W. Broten, and Gladys A. Harvey. Robishaw is writing historical sketches for each.

He is also indexing over 200 boxes of archival material at DRAO and compiling a list of all previous staff and students. He has been working with Joe Tenn (Sonoma State

U., retired) to populate the Canadian radio astronomy family tree on the AAS AstroGen database. In the process he has found that the UK and German radio astronomy family tree is extremely incomplete on AstroGen. He plans to rectify this by working with colleagues in the UK and Germany.

3. Preservation pf historical radio-astronomical equipment

The Horn-Reflector used by A. Penzias and R. Wilson in 1964 to discover the Cosmic Microwave Background radiation is located at the Nokia Crawford Hill site in New Jersey (USA). The site has been sold by Nokia to a New Jersey property developer who has promised to leave the Horn Reflector in place and maintain public access. However, the plans for the site as a whole have not been made public. The situation will be monitored by WG members.

The Jansky historical landmark at Holmdel, New Jersey, has not been maintained as expected, and WG members have contacted local government authorities in an effort to remedy the situation.

4. WGHRA Website

The WG website http://rahist.nrao.edu/ is a repository of a considerable amount of historical material including WG contributions to the IAU Triennial Reports from 2006 to 2018; reports from the Commission J (Radio Astronomy) Business Sessions to URSI for 1946-2017 (not complete), triennial reports from Commission J to URSI from 1994–2017; presentations on the history of radio astronomy at conferences since 2009 (not complete); a list of Grote Reber Medalists; biographical memoirs of deceased radio astronomers; related resources; and access to the NRAO/AUI archives (https://www.nrao.edu/archives/) and the CSIRO Radio Astronomy Image Archive https://www.atnf.csiro.au/ImageArchive /index.html. New material in the NRAO Archives includes papers of Bernard Burke, Martha Stahr Carpenter, NRAO-ALMA, and over 8,000 digitized images. The CSIRO archive holds a collection of over 15,000 images that relate to the early history of radio astronomy in Australia taken between 1943 and 1996 by professional photographers at the CSIRO Division of Radiophysics and the CSIRO Australia Telescope National Facility.

Sadly, twenty-two of our colleagues have passed away since the General Assembly in 2018.

5. Future activities

A 3-hour session on Historical Radio Astronomy will take place during the URSI General Assembly in August 2021. The topic will be The Impact of Radio Astronomy on Technology and Society and include talks on The Story of WiFi; VLBI, Navigation, and Geodesy; Cold-War Diplomacy at the Jodrell Bank Observatory; Radio Interferometry and Medical Imaging; Deep Space Navigation; and The Parkes Dish and the First Moonwalk.

The WG plans to include a Business Session and some talks as part of the Division Days during the IAU GA in Busan in 2022. Topics for talks are under discussion.

Other activities planned include

– continuation of the research projects mentioned above,

– monitoring progress on the preservation of historical instrumentation issues also mentioned above, and

– maintaining and augmenting the WG website.

A number of books are in press or in preparation, see Table 3.

Table 3. Books on historical radio astronomy in press or in preparation

Authors/Editors	**Title**
Campbell, D.	*History of the Arecibo Observatory*
Gregorini, L., Feretti, L., Giovannini, G., Mantovani F., Parma, P. and Vettolani, G	*Why don't you build a radio telescope? 40 years of Radio Astronomy in Bologna* (in Italian). (In press, Bologna University Press). The English translation is in preparation.
Goss, W. M., Ekers, R. D., and Hooker, C.	*From the Sun to the Cosmos, J.L. Pawsey, Founder of Australian Radio Astronomy* (in press, Springer)
Gurvits, L. I., Hirabayashi, H. and Schilizzi, R. T.	*Space VLBI Radio telescopes Larger than the Earth* (to be published by Springer)
Kellermann, K. I. and Bouton, E.	*Star Noise: Discovering the Radio Universe* (to be published by CUP)
Wall, J. V., Griffin, E., and Jarrell, R.	*A Young Science in a Young County: The Origins and History of Canadian Radio Astronomy* (to be published by Springer)
Schwartz, R. and Zensus, J. A.	*History of the Max Planck Institute for Radioastronomy* (English translation)
Schilizzi, R. T., Ekers, R. D., Crosby, P. and Dewdney, P. E. D.	*The Square Kilometre Array: a mega-science project in the making, 1993-2012*
Vanden Bout, P. and Dickman, R.	*The ALMA Radio Telescope Birth Pangs of a Megaproject*