

RAFACP Meeting

Beijing

24 August 2012

(IAU GA)

Program outline

- **Reports**

- Introduction to RAFCAP
- Members (Australia; China; Japan;...)
- “Sisters” (IUCAF; CRAF; CORF)
- **Reports from ITU-R**
 - WP7D; RA-2012; WRC-2012; the "2% issue"

- **Discussions and Actions**

- WRC-2015 issues
- WP7D: (Handbook; Reports;)
- CORF Report on "Spectrum Management for Science in the 21st Century"
- Relationship with sister organisations; Mtgs/telecons
- Other current issues ?
- Upcoming meetings and RAFCAP

History, Mission

RAFCAP

Radio Astronomy Frequency Committee
in the Asia-Pacific region

- RAFCAP was setup during the AP-RASC meeting, held from 31 July to 4 August, 2001, in Tokyo.
- <http://www.atnf.csiro.au/rafcap>
- The need for such a committee in the Asia-Pacific has been described in a paper by Dr. M. Ohishi ([MS-Word format](#) or [Hypertext format](#)).
- [A charter for RAFCAP](#) was proposed and accepted by the Committee, and governs the operations of this Committee.
- [The membership of RAFCAP](#) comes from Radio Astronomy and related organisations in the Asia Pacific region.
- A summary of RAFCAP's mission and contacts are provided in a ["RAFCAP Flyer \(2004\)"](#) document (MS-Word format).
- A list of operating [Radio Telescopes in the Asia Pacific](#) region (May 2005) is given in [Table 1](#).

- **RAFCAP (Radio Astronomy Frequency Committee in the Asia-Pacific region)**
- RAFCAP acts as the **scientific expert committee on frequency issues for the Asia-Pacific radio astronomy and related sciences**. The mission of RAFCAP is:
 - (a) **to keep the frequency bands used for radio astronomical observations free from interference.**
 - (b) **to argue the scientific needs of radio astronomy for continued access to and availability of the radio spectrum for radio astronomy within the Asia-Pacific region.**
 - (c) **to support related science communities in their needs of interference-free radio frequency bands for passive use.**

RAFCAP Members & Associates - June 2010

RAFCAP

Radio Astronomy Frequency Committee
in the Asia-Pacific region

- **Management group:**
- *Chairperson:* Tasso Tzioumis (ATNF, Australia)
- *Secretary:* Haiyan Zhang (National Astr. Obs., China)
- *Past chair:* Masatoshi Ohishi (NAO, Japan)
- **Members:**
- S. Ananthakrishnan; Praveen Kumar (GMRT, TIFR, India)
- Jiang Dongrong (Shanghai Obs. China)
- Osamu Kameya (NAO, Japan)
- HyunSoo Chung (Korea Astr. Obs., South Korea)
- Bong-won Sohn; Sang-sung Lee (KASSI, South Korea)
- Chen Ming-Tan (ASIAA, Chinese Taipei)
- Nafizah G Khan (Astronautic Technology, Malaysia)
- Zamri Zainal Abidin (University of Malaya, Malaysia)
- Sergei Gulyaev (Auckland University, NZ)
- **Associates:**
- T.L. Venkatasubramani (Hart RAO, South Africa)
- Uday Shankar (RRI, India)
- Makoto Inoue; Jeremy Lim (ASIAA, Chinese Taipei)
- Yashwant Gupta (GMRT, TIFR, India)
- Kaichi Tatsuzawa (NOAJ, Japan)

Worldwide RA frequency committees

- **IUCAF** : IAU + URSI + COSPAR
- Europe -- **CRAF**
Committee for Radio Astronomy
Frequencies
- US -- **CORF**
Committee on Radio Frequencies
- AP region – **RAFCAP**
 - Japan: Radio Astronomy Frequency Committee

RAFCAP mtg – IAU Aug '12

- **REPORTS**

- Members (China; Oz; Japan;...)
- “Sisters” (IUCAF; CRAF; CORF)
- **Reports from ITU-R**
 - WP7D
 - RA-2012
 - WRC-2012
 - the "2% issue"

Oz Report - Spectrum

- Notification Zones (RALI MS31)
 - Working very well with existing telescopes
- SKA RQZ in legislation as:
 - *“The Radiocommunications (Mid-West Radio Quiet Zone) Frequency Band Plan 2011”*
 - + existing RALI MS32
- → **Strong RQZ protection**
- ASKAP (700-1800 MHz) & MWA (80-300 MHz)
 - In the RQZ area now!
 - In commissioning & will be registered with ITU-R
- EMC emissions and protection (C. Wilson)

Reports

- China
- Japan
- ... other members
- IUCAF? (2pm meeting. Room 305)
- CRAF
- CORF
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ITU-R – WP7D (1)

- New/Revised Recs
 - **New** Rec RA.1860: “Preferred frequency bands for radio astronomical measurements in the range 1-3 THz” (2010)
 - Revisions started on:
 - RA.1417: “RQZ at L2 point” – with WP7B
 - RA.1513: “RAS data loss levels and % time” – controversial
- New Question: [252/7](#) “Parameters needed for the registration of distributed radio astronomy systems”
- WP7B New Question: “Nano and pico satellites”

ITU-R – RAS Reports (2)

- [RA.2126](#): “RFI mitigation” 2007 – needs revision
- [RA.2131](#): “Supplementary info for RA.769” 2008
- [RA.2163](#): “Astronomy use of 50-350 THz” 2009
- [RA.2188](#): “Potentially damaging levels to RAS Receivers” 2010
- [RA.2189](#): “Sharing between the radio astronomy service and active services in the frequency range 275-3 000 GHz” 2010
- [RA.2195](#): “DTV and RAS” - 2010
- **RA.RQZ**: “RQZs” – 2012 (approved)

Note: many Reports only published in English. Easier/
cheaper to change. Preferred in ITU.

ITU-R – WP7D (3)

- Many other issues:
 - Power line Communications (Ohishi)
 - Cognitive radio (WRC-12)
- RAS Handbook – 10 years old
 - Revision underway
 - Volunteers needed for chapter revisions
 - New chapters?

ITU-R – RA'12

- Administrative issues
 - Some changes in working methods
 - Simultaneous adoption and approval
- Leap second issue
 - Abolish leap seconds?
 - 10 year study by WP7A
 - Political concerns
 - UK strong objection
 - RA split into 3: For; against; did-not-know
 - → AI 1.14 for WRC-15
 - IAU: ~ 70% for & 30% against (at Rio)

ITU-R – WRC12 (1)

- Overall OK for RAS
- ** AI 1.6: 275–3000 GHz & optical links ✓
 - Rec RA.1860 & Report RA.2189
 - Footnote 5.565 revised
 - Only AI item with *direct* RAS interest
- AI 1.3: Unmanned aircraft (UAS) ?? ✓
 - Near 5 GHz and 15.4 GHz – adjacent RAS bands
- AI 1.4: Aeronautical mobile near 5 GHz. NC ✓
- AI 1.8: FS in 71-238 GHz -- ✓
- AI 1.19: SDR & CRS – NC ** but watch future?

ITU-R – WRC12 (2)

- AI 1.20: HAPS near 6.7 GHz – OK
- AI 1.21: Airborne Radar near 15.4 GHz
– See 2% issue
- AI 1.22: Short Range Devices – NC
- AI 1.25: MSS links – NC
- AI 8.1.1C – Essential Role Report - OK

2% issue (AI 1.21)

- *“**5.B121** In order to protect the radio astronomy service in the frequency band 15.35 - 15.4 GHz, radiolocation stations operating in the frequency band 15.4 15.7 GHz shall not exceed the power flux-density level of -156 dB(W/m²) in a 50 MHz bandwidth into the frequency band 15.35 - 15.4 GHz, at any radio astronomy observatory site for more than 2 per cent of the time.”*

- *“Some delegations argued for removing the phrase “for more than 2 per cent of the time” from footnote 5.B121. The percentage of data loss for radio astronomy is the subject of Recommendation ITU-R RA.1513, the revision of which should be undertaken during the next ITU-R study cycle. These studies should take into account that in this case the No 5.B121 refers to a band labelled with No 5.340, for which interference thresholds are given in Recommendation ITU-R RA 769’. Furthermore, it should be studied what the operational consequences for the radiolocation service are, in case the phrase: “for more than 2 % of the time” would not be included in the footnote 5.B121.*
- *The conclusions of these studies should be included in the report from the Director of the Radiocommunications Bureau to WRC-15, allowing WRC-15 to decide whether or not the words “for more than 2 per cent of the time” should be deleted from the Footnote 5.B121 during WRC-18.”*

Issues

- Public divisions in RA ranks
 - Not a very good image
- Lack of effective communications
 - We should have identified and solved **before** the WRC
- Has created some tensions within our community
- Lessons learned??

RAFCAP mtg – IAU Aug '12

- **Discussions and Actions**

- WRC-2015 issues
- WP7D: (Handbook; Reports;)
- CORF Report on "Spectrum Management for Science in the 21st Century"
- Relationship with sister organisations
 - Meetings/telecons
- Other current issues ?
- Upcoming meetings and RAFCAP

WRC-15

- WRC in November 2015.
- CPM in March-April 2015
- CPM Preparations by mid 2014!
- Very little time for studies!!

- NO specific RAS Agenda Items (AI)
- Formally interested in 7 items.
- Most items may have some impact on RAS
 - Especially with wide-band systems

WRC'15 – Agenda Items (1)

- AI 1.1: International Mobile Telecoms (IMT)
 - May affect any band!! (talks mostly below 5 GHz)
 - JTG 4-5-6-7 – separate meetings
 - Already July'12; Next Nov'12!
 - Most likely to affect some RAS bands
- AI 1.5: Unmanned Aircraft Systems (UAS)
- AI 1.6: Fixed Satellite Service (FSS) 13-17 GHz
- AI 1.9: FSS 7 & 8 GHz – VLBI at 8.4 GHz?
- AI 1.10: MSS & IMT – 22-26 GHz
- AI 1.12: EESS 8.7-10.5 GHz – RAS@10.6?

WRC'15 – Agenda Items (2)

- AI 1.14: Leap second.
- AI 1.17: Wireless Avionics (WAIC)
 - Bands? – may affect nearby RAS bands
- AI 1.18: Automotive radar 77.5-78 GHz
- AI 9.1.8 and AI 2.2:
 - Nano and pico satellites
 - Studies in prep for WRC'18!!
- 2% issue under AI 9 ??
 - Need revision of Rec.1530 & liaison with SG5

WP7D upcoming issues

- WRC'15 preparations
 - Participate in studies
 - Respond quickly to developments in other WPs
- RAS Handbook update
 - Need volunteers
 - Revised chapters &/or new Chapters
 - Finish by end 2013?
- Update/review Recommendations and Reports

NRC Committee Report

"Spectrum Management for Science in the 21st Century"

http://www.nap.edu/openbook.php?record_id=12800

21st Century – Rec 1

- *The development of the means for direct interaction between the active and passive spectrum users in order to protect current and future scientific uses of the spectrum.*
 - The nation needs to provide the policies to strike a balance between pursuing advanced technology to decrease the cost of communications on the one hand and, on the other, to make the spectrum more usable and less noisy for all users;

21st Century – Rec 2

- *A regulatory environment that enables sharing the spectrum in both space and time.*
 - This is a “win-win” scenario that will enable additional scientific uses without impacting commercial development;

21st Century – Rec 3

- *Investment in technology to enable spectrum sharing between active and passive users, over the entire radio spectrum.*
 - This investment should become commensurate with the investment made in remote sensing technology.

Relationships

- Better international coordination?
 - International: IUCAF
 - Regional: CORF, CRAF, RAFCAP
- Produce consolidated RAS position for WRC?
 - Preparation and coordination?
- More common meetings?
 - Already attend each other's meetings.
 - Schedule world-telecons?? Quarterly?

Other issues/meetings

- WP7D in Manta Ecuador, 24-28 Sept'12
 - Preceded by SG7 Seminar (20-21 Sept)
- JTG 4-5-6-7 In Geneva – Nov 2012
 - Expect many regular meetings!
- WP7D & SG7: April 2013 – Geneva
- WP7D: Sept 2013
- APG meetings: 1st on 10-11 Sept'12!
- CORF meeting Oct 12-13, 2012 + May'13?

AOB

- RAFCAP membership?
- APT participation?
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