



CRAF News

The newsletter of the ESF Expert Committee
on Radio Astronomy Frequencies

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Editorial

Guy Rochard's death just before Christmas shocked all of us. Guy had always strenuously defended the spectrum usage by passive services, in particular meteorology. We will never forget his dedication, commitment and personal sympathy.

At the same time, I have the pleasure of extending a warm welcome, in the name of all CRAF members, to our three new collaborators: Patrick Bressler, as ESF liaison; Laurentiu Alexe, as CRAF Frequency Manager (since October 2005 when he started work in Dwingeloo); and Pietro Bolli as CRAF Secretary (elected unanimously at CRAF41 in Aveiro). Dr. Titus Spoelstra will continue to help in the background for some time, as supporter and good adviser for all of us. Thanks Titus for all that you have done for CRAF and for whatever help you will provide in future.

The European Science Foundation (ESF) is proposing a new strategic plan in view of a possible integration with the European Research Council (ERC). When consulted on this, CRAF has stressed the need for keeping ESF independent of industrial and commercial interests. We expect that ESF will support us by defending the basic research requirements; in particular regarding the vulnerability of a passive service such as radio astronomy. Radio astronomy wants to disclose the mysteries of the origin and evolution of the universe by making experimental observations of radio sources in the distant universe, which produce signals on Earth that are many orders of magnitude weaker than those produced by the radio telecommunication service. Our activity is currently facing an unprecedented direct confrontation with many new usages of the radio spectrum. Some of these offer huge economic returns in a very short time

scale that cannot be compared in any way with the benefits brought about by fundamental discoveries of science on a much longer evolutionary time scale.

In June 2005 we had the Second Summer School on Spectrum Management. This was a great success: first, because of the very wide representation of teachers both in their individual expertise and international affiliations and second, proved by the substantially positive feedback of the students. For the next summer school we would like an even larger and more international audience.

In spite of all the changes, CRAF is still very much alive and motivated in its goals. On behalf of the radio astronomy community I thank the old and new CRAF members for all the efforts that they have put and will put into this activity.

Roberto Ambrosini

Istituto di Radio Astronomia, Bologna

1. Report from the 41st CRAF meeting (17-18 November 2005)

The 41st CRAF meeting took place on 17 and 18 November 2005 at the Instituto das Telecomunicações, in Aveiro (Portugal). The following key items were discussed.

• Intensify CRAF participation in ITU meetings.

Ohishi from NAOJ pointed out that very few radio astronomers attend ITU meetings. He encouraged all the CRAF members as well as their radio astronomer colleagues to participate in ITU meetings. A wider participation from the radio astronomical community would improve CRAF visibility and would help in preserving access to the electromagnetic spectrum by the radio astronomy service. Each CRAF member must make his/her best effort to attend such ITU meetings in person or send a representative.

• CRAF Memorandum of Understanding and Annex 2.

The MoU is primarily intended as a sort of obligation for the observatories to financially support the Frequency Manager. Several nations have signed the MoU, whereas other nations' signatures are still pending for many different reasons.

• RadioNet FP6.

RadioNet has been a great success in funding travel expenses for CRAF members, radio astronomical scientists interested in CRAF meetings, and as the main sponsor of the 2005 Summer School on Spectrum Management for Radio Astronomy. During the meeting, it was pointed out how important it is to increase the communication between the radio astronomy observers and the people in charge of frequency protection of the radio astronomical bands. For this purpose all comments are welcomed.

• Radio Spectrum Policy Group.

The RSPG addressed the request by France and the Netherlands to the Radio Spectrum Policy Group for an opinion on 'a coordinated EU spectrum approach for scientific use of radio spectrum'. Passive services, such as radio astronomy and meteorological science (as users of internationally assigned frequency bands) are not represented, either as members or as observers.

• New CRAF Secretary.

During the meeting Pietro Bolli's nomination was unanimously approved. Dr. Bolli is an electronic engineer with a PhD in computer science and telecommunications from the University of Florence. He is currently a research engineer at the Institute of Radio Astronomy, Bologna, where he conducts research on electromagnetic aspects of instrumentation (large reflector antennas and passive microwave devices) for radio astronomy applications.

The next CRAF meeting is scheduled for 6 and 7 April 2006 at the Observatoire de Bordeaux.

2. Summer School 2005

The second Summer School in Spectrum Management for Radio Astronomy was held in Castel San Pietro Terme (Bologna, Italy), from 6 to 10 June 2005. This second Summer School followed the first one held in Green Bank (West Virginia, USA) in 2002. SS2005 was sponsored by RadioNet, IUCAF, the Municipality of Castel San Pietro and the Institute of Radio Astronomy of the National Institute for Astrophysics. The purpose of SS2005 was to offer a comprehensive view of both regulatory and technical issues related to radio astronomers' use of the spectrum, as well as a view of how these issues are dealt with by other passive radio services.

The composition of the team of SS2005 teachers was pan-European and even more international: there were representatives from the European Commission, the Italian Administration, and radio frequency management experts coming from the main observatories all over the world. The Organising Committee was co-chaired by W. van Driel (IUCAF) and R. Ambrosini (CRAF), with members A. Clegg (NSF), A. Boonstra (Astron), J. Cohen (Jodrell Bank), T. Gergely (NSF), B. Lewis (NAIC), H. Liszt (NRAO), E. Marelli (ESA), M. Ohishi (NAOJ), T. Spoelstra (CRAF), K. Tapping (DRAO) and A. Tzioumis (CSIRO).

The participants were 21 members of the radio astronomy and related radio engineering community, coming from Europe and South Korea.

The main issues discussed during the SS2005 were:

- Views of spectrum management from the Italian and the EC Administrations.
- Technical aspects of the instrumentation for radio astronomical observations.
- Interference to radio astronomy.
- National and regional regulatory structures: Europe, the Americas and the Asia-Pacific region.
- International regulatory structures: ITU-R recommendations, ITU structure, WRCs and preparatory mechanisms, IUCAF.
- Case-studies in satellite coordination: Iridium, GLONASS, Cloudsat.
- Other science services: Space Frequency Coordination Group, Earth Exploration Satellite Service, Meteorology and Remote Sensing.
- Expanding the spectrum frontier from sub-mm to optical.
- Regulatory implications of new interfering technologies: UWB, vehicular short range radar, power line communications.
- New telescopes (ALMA and SKA), interference mitigation and Radio Quiet Zones.

During the SS2005, two visits took place to:

- the Medicina radio astronomy station, to see the Northern Cross which, as one of the largest transit radiotelescopes in the world, still plays a key role in Low Frequency (408 MHz) observations, and the 32-m single-dish radio telescope, which is part of the European VLBI Network; and
- the Marconi Museum, where, in the family villa, the young inventor made the first-ever telecommunication experiment across an obstructed radio path.

All the presentations, the final programme, and several photographs of the sessions are downloadable from the RadioNet Wiki page of the Network Activity NA8 on Spectrum Management: <http://www.radionet-eu.org/rnwiki/SpectrumManagementWikiPage>.

3. RSPG actions and Radio Astronomy

The Radio Spectrum Policy Group (RSPG) was established under the European Commission Decision 2002/622/EC as one of the actions following the adoption of the Radio Spectrum Decision 676/2002/EC. The RSPG shall adopt opinions, which are meant to assist and advise the European Commission on radio spectrum policy issues, on coordination of policy approaches and, where appropriate, on harmonised conditions with regard to the availability and efficient use of the radio spectrum necessary for the establishment and functioning of the internal market. The RSPG should consult extensively and in a forward-looking manner on technological, market and regulatory developments relating to the use of radio spectrum in the context of EU policies on electronic communications, transport and research and development. Such consultations should involve all relevant radio spectrum users, both commercial and non-commercial, as well as any other interested party.

The members of RSPG are representatives of the EU Member States and of the Commission. Representatives of the EEA countries, the candidate countries, the European Parliament, the European Conference of Postal and Telecommunications Administrations (CEPT) and the European Telecommunications Standards Institute (ETSI) attend as observers.

The policy issues considered by RSPG are wide ranging and include scientific use of spectrum. The indicative context was to "Discuss the implications of the increasing market demand for spectrum and of new technologies (e.g. UWB) on the availability of spectrum for scientific use." The RSPG recognises the high level of protection against interference that passive services require, but is also tasked with balancing this against other EC policies, as we have seen in the case of short-range radar (SRR) at 24-GHz (*CRAF Newsletter 11*), where road safety considerations took priority over technical and regulatory arguments. The 'temporary' use of the passive band by 24-GHz SRR, when a dedicated allocation for this application has already existed since WRC-97, sets a dangerous precedent.

The work programme of the RSPG includes public consultations, some of which could have major implications for the science services, such as:

- Public consultation on Wireless Access Platforms for Electronic Communications Services (WAPECS);
- Consultation in the context of the development of an RSPG opinion on priorities and objectives for the (European) Community in the WRC-2007;
- Public consultation on secondary trading of rights to use radio spectrum.

There are also workshops and specially commissioned studies. In particular, the RSPG is currently preparing an opinion on scientific use of spectrum. This was initiated following a submission by the Netherlands and France, reflecting the strong disquiet among the science community caused by the authorisation of 24-GHz SRR in Europe. The RSPG agreed to establish a working group which is co-chaired by the French and Dutch delegations. The first meeting of the working group took place in October 2005, with participation by the scientific community. This is a very positive step. However, the outcome of the work is not predetermined at this stage. It could be an

opinion, if that is considered appropriate, or it could take other (weaker) forms, such as a recommendation. A draft document is in preparation and further meetings of the working group are planned. The working group will report to RSPG in May 2006.

André Deschamps, Observatoire de Paris

4. SKA Design Study (SKADS)

The Square Kilometre Array (SKA) will be the next generation large radio telescope, able to map the sky with a sensitivity 100 times greater than is currently possible. European radio astronomers were the first to outline the basic rationale for such a telescope over ten years ago but the project is now a full-scale collaboration between scientists and engineers from all over the world. The timeline calls for Phase 1 (10% of the area) to be completed in 2014 with the full instrument being ready by 2020.

European radio astronomers and engineers are developing a fundamentally new design concept for the SKA based on phased arrays. The SKADS consortium, consisting of 29 institutes in Europe and in four non-EC countries, has recently obtained funding to develop the required enabling technologies. These include broadband focal plane antenna arrays, robust microwave amplifiers, ultrafast analogue-to-digital converters and signal processing, high data throughput networks, and precise time and frequency transfer techniques via optical fibres. The four-year design study will cost €38 million, €10 million being provided by the European Commission's FP6 Design Studies programme and €28 million coming from individual countries of the SKADS consortium.

With the funding of SKA-demonstrator programmes in Australia, South Africa and the USA it can be said that 2005 was the year that the SKA project started in earnest. A fully-costed design for the complete instrument is expected in 2009.

5. New CRAF Frequency Manager

CRAF has a new frequency manager, Laurentiu Alexe, who took up the position in Astron in September 2006. Laurentiu Alexe has previously worked in research, industry, education and for the Romanian Telecommunications Administration (IGCTI) where, during last six years, he has held various positions as a frequency management expert, spectrum monitoring expert and head of the broadcasting department. He was involved in European harmonisation activities and he has experience in CEPT meetings. Outside working hours he enjoys being an active radio amateur.

He replaces Titus Spoelstra who has served CRAF since its foundation in 1987, first as CRAF Secretary, and since 1997 as Frequency Manager. We thank Titus for his enormous contribution to CRAF and wish him a long and happy retirement.



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Abbreviations used in this Newsletter

ALMA:

Atacama Large Millimetre Array

Astron:

Foundation for Research in Astronomy,
the Netherlands

CEPT:

Conference of European Post and
Telecommunication administrations

CRAF:

Committee on Radio Astronomy
Frequencies (ESF)

CSIRO:

Commonwealth Scientific and Industrial
Organisation (Australia)

DRAO:

Dominion Radio Astrophysical
Observatory (Canada)

EEA:

European Economic Area

EC:

European Commission

ERC:

European Research Council

ESA:

European Space Agency

ESF:

European Science Foundation

ETSI:

European Telecommunications
Standards Institute

EU:

European Union

GLONASS:

GLObal NAVigation Satellite System
(Russia)

IGCTI:

Inspectoratul General pentru Comunicatii
si Tehnologia Informatiei (Romania)

ITU:

International Telecommunication Union

ITU-R:

International Telecommunication Union –
Radiocommunication Sector

IUCAF:

Scientific Committee on the Allocation
of Frequencies for Radio Astronomy
and Space Science (Unesco)

NAIC:

National Astronomy and Ionosphere
Centre (USA)

NAOJ:

National Astronomical Observatory
of Japan

NSF:

National Science Foundation (USA)

NRAO:

National Radio Astronomy Observatory
(USA)

RSPG:

Radio Spectrum Policy Group (EU)

SKA:

Square Kilometre Array

SKADS:

Square Kilometre Array Design Study

SRR:

Short Range Radar

UWB:

Ultra Wide Band

VLBI:

Very Long Baseline Interferometry

WAPECS:

Wireless Access Platforms for Electronic
Communications Services

WRC:

World Radiocommunication Conference
(ITU)

European Science Foundation (ESF)

The European Science Foundation promotes high quality science at a European level. It acts as a catalyst for the development of science by bringing together leading scientists and funding agencies to debate, plan and implement pan-European initiatives. It is an association of 78 national research councils, academies and other funding agencies from 30 countries.

**Committee on Radio Astronomy
Frequencies (CRAF)**

CRAF is an Expert Committee of the European Science Foundation. Established in 1988, it represents all the major radio astronomical observatories in Europe. Its mission is to coordinate activities to keep the frequency bands used by radio astronomers in Europe free from interference.

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