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| Dissemination Level | | |
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| PU | Public | X |
| PP | Restricted to other programme participants (including the Commission Services) | |
| RE | Restricted to a group specified by the consortium (including the Commission Services) | |
| CO | Confidential, only for members of the consortium (including the Commission Services) | |

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2. Summary Report of the 57 Meeting of CRAF

2.1 ESF Expert Committee on Radio Astronomy Frequencies

The 57th CRAF meeting organized by School of Physics, Trinity College (TCD), Dublin, took place on 12-13 May 2015 in Birr Castle, Birr (Ireland).

A guided visit to the 'Leviathan of Parsonstown', which was at once (1840) the largest optical telescope in the world, was organized for interested participants during the afternoon of Tuesday 12 May 2015. A visit to the Rosse Solar-Terrestrial observatory (RSTO) was also performed by interested participants during the lunch break of Wednesday 13 May 2015.

2.2 Participants

The CRAF meeting was opened at 9.00 am on 12 May 2015 by Prof. Peter Gallagher (Professor of Physics at School of Physics, Trinity College, Dublin), who welcomed the participants.

The following CRAF members attended the meeting: V. BEZRUKOV, P. BOLLI, W. VAN DRIEL, T. HEZAREH, A. JESSNER, K. JIRICKA, J. KALLUNKI, H. VAN DER MAREL, C. MARQUE, C. MONSTEIN, V. PIETU, J. SEREIDAKIS, I. THOMAS, P. THOMASSON, V. TORNATORE.

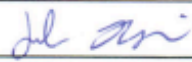




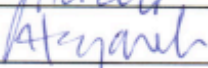
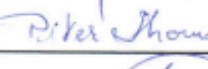

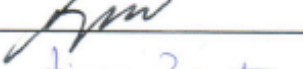
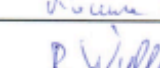
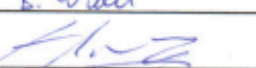


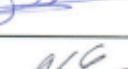
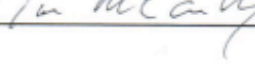



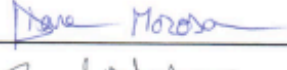
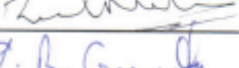
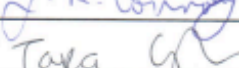
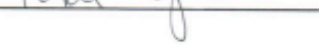
Apologies for not participating the meeting were received from M. LINDQVIST, H. HASE and A. TIPLADY.

The following participants were invited as CRAF Observers to the whole meeting: B. Winkel and J. McCauley, whereas the following participants: Jim Connolly (Commission for Communications Regulation (ComReg), Irish Administration), Tara Kavanagh (COMREG), Zeeshan Nazneen (COMREG), Diana Morosan (TCD Physics), Dr. Pietro Zucca (TCD Physics), Prof. Peter Gallagher (TCD Physics) joined the meeting during the afternoon session of 12 May 2015.

Martin Hynes (ESF) joined part of the closed morning session of 12 May 2015 by video-link. A joint discussion was organized by video-link during the afternoon session of 13 May 2015 with the CORF meeting in Keck Center, Washington, DC, USA.



CRAF 57 Attendance List

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2.3 Communications about CRAF

Correspondence

A letter from the director of the Astronomical Institute of the Academy of Sciences of the Czech Republic was received announcing that from 2015 there will be no Czech contribution to the CRAF budget anymore. A letter has been received from European Incoherent Scatter Scientific Association (EISCAT) in which EISCAT announces its resignation as CRAF member.

It is decided to offer the Czech Republic and EISCAT the status of Observer to continue their involvement in CRAF.

New member

CRAF welcomed Dr. Vincent Piétu from Institut de Radio Astronomie Millimétrique (IRAM) as a new member.

Communication

The CRAF chair mentions that he will revive the CRAF news mail that is sent to CRAF members and affiliates every 2 months. The CRAF FM informs that she will distribute more regularly reports from meetings.

A concept for a new CRAF website was presented and the meeting agrees Roelie Kamminga to transfer the current CRAF website into the new concept. The CRAF members were asked to examine the material at the old web site before its transfer to the new site.

Chairmanship

The Chair Hans Van der MAREL communicated that he is not going to take a two year extension of his term. A committee of three CRAF members: LINDQVIST, THOMASSON and BOLLI has been delegated to identify new candidates for election of a new chair.

Modification of the Charter and Rules and Procedures

Some proposed modifications to the Charter and Rules and Procedures were discussed:

- Expenses for travel and stay to represent CRAF at international meetings can be reimbursed by CRAF from the CRAF budget.
- A minimum of one annual meeting is introduced. Additional meetings will be organized if necessary.
- Next to the position of chairman and secretary, a position of vice-chair will be introduced. The vice-chair can replace the chair or secretary, in case of absence.

These modifications were supported by the members and will be used as input for the discussions with the new host.

CRAF budget

In 2014 CRAF stayed within the projected budget. For 2015 it is expected that the incomes and expenditures be exactly in balance. It is decided not to change the CRAF contribution for 2015. For 2016 and beyond it is to be expected that the CRAF contribution will have to go up, because of larger overhead costs by the host organization and reimbursement of travel and stay to members due to the absence of a RadioNet project. A decision about change of contribution is postponed until more details are available later this year.

2.4 Communications about ESF

Martin Hynes, ESF CEO (European Science Foundation Chief Executive Officer) reported on the ESF situation by video-link. He recalled that the ESF membership had decided to follow a resignation model, in which current members can resign, and the organization would continue to exist in a smaller form, subject to a viability check. The viability check has just been finished and concluded that the continuing ESF was viable and financially feasible. It would support staffing of 30 to 40 personnel over the period to end 2018. Support for the Expert Boards and Committees, such as CRAF could continue to be one of the services offered. In mid-June 2015 the ESF Governing Council will decide whether the ESF can start to build the Successor Organization. Several details have to be worked out, such as the overhead costs. It is likely that these will go up, probably to a level of around 6%.

2.5 Future hosting

The viability of a successor organization of the ESF has been unsure for several years. Over the years CRAF has been looking in alternative hosts and it appeared that only JIVE met the requirements of CRAF for a host.

In April 2015 JIVE was inaugurated as an ERIC and is now called JIV-ERIC. Previously the JIVE Board indicated that CRAF should see hosting by JIVE as a last resort. In the end of 2014 it looked like there would be no successor of the ESF and that CRAF has to move to the JIV-ERIC. Initial discussions with JIVE have started to see how CRAF would fit in the JIV-ERIC structure and what conditions would apply. Details have not been worked out. Being hosted by the JIV-ERIC probably means somewhat less independence, but a higher visibility in the radio astronomy community. The overhead costs will probably go up to values of 7-10%.

It was decided that CRAF should continue talking to both ESF and JIV-ERIC, and to wait for the decision of the Governing Council Meeting (mid-June 2015). If there is a positive decision, then both hosting options should be worked out in more detail. It is proposed to have an intermediate CRAF meeting around half of September 2015 to discuss hosting issue and also the World Radio Conference (WRC-15) preparation.

2.6 Frequency Management (FM) Activities

HEZAREH presented the FM report, containing the activities of the FM in the period 15 March 2014 to 30 April 2015. The main workload for the CRAF Frequency Manager is generated by the various aspects of preparation for, participation in and follow-up activities required for on-going involvement in the many Conférence européenne des administrations des postes et télécommunications (CEPT) & International Telecommunication Union (ITU) spectrum engineering & frequency management meetings attended. Out of office time (i.e. meeting attendance & travel) currently approximates to ~50-60% of the FM's allocated hours. The bulk of the FM's time when not attending or travelling to meetings is spent in advance preparation; including if necessary, the development for submission of written contributions on technical or regulatory issues.

In the period 15 March 2014 until 30 April 2015 CRAF has been represented at 24 meetings. In the same period CRAF has written and contributed to 16 technical or regulatory input documents to the spectrum management process.

CRAF approved the FM's report for the period 2014-2015.

2.7 Issues of concern to the Radio Astronomy Service (RAS) in CEPT/ITU

Apart from the WRC-15 agenda items the following issues are of concern to the RAS:

- CEPT Working Group Frequency Management (WGFM)/Frequency Management 44 (FM44) /Spectrum Engineering 40 (SE40): Iridium and more specifically the future Iridium NEXT satellites.
- CEPT FM44: Inmarsat Mobile Earth Stations (MES) and Aircraft Earth Station (AES) operation on the extended 1670-1675 MHz band
- CEPT Spectrum Engineering (SE7): Public Protection and Disaster Relief (PPDR) in 400 MHz band
- CEPT SE7: Programme Making and Special Events applications (PMSE) in 1350 – 1400 MHz
- CEPT Forum group ‘Spectrum engineering reference document’
- CEPT Forum group in Wind turbines
- CEPT Forum Group on Mobile Communications on board Aircraft (MCA) Network Control Unit (NCU) unwanted emissions
- ITU Working Party 7D (WP7D): Revision of Radio astronomy 1513 (RA.1513)

2.8 WRC-15 Brief

From 2 to 27 November 2015 the World Radio Conference 2015 (WRC-15) will take place in Geneva, Switzerland. Preparations for it are going full speed ahead. The following WRC-15 Agenda Items are of interest for RAS:

- AI 1.1 (International Mobile Telecommunication (IMT), several bands between ~470 MHz and ~6 GHz)
- AI 1.2 (IMT in 694–790 MHz)
- AI 1.5 (Unmanned aircraft systems in Fixed Satellite Service (FSS) bands)
- AI 1.6.1 (Additional allocation of 250 MHz for fixed satellite service (FSS) in 10–17 GHz)
- AI 1.8 (Review of provisions relating to earth stations on board vessels)
- AI 1.9.1 (New allocations to FSS in 7150– 250 MHz (space-to-earth) and 8400 – 8500 MHz (earth to space), this last band is also used for geodetic VLBI.
- AI 1.10 (Additional spectrum for mobile-satellite service in 22–26 GHz range)
- AI 1.12 (Up to 600 MHz additional bandwidth for Earth Exploration Satellite Services (EESS) (active) in 8700-9300 MHz and/or 9900 – 10500 MHz)
- AI 1.16: (New and enhanced applications of the maritime Automatic Identification System (AIS) technology in 156–162 MHz)
- AI 1.17 (Wireless avionics intra-communications (WAIC))
- AI 1.18 (Automotive short range radar in 77.5 – 78 GHz)
- AI 10 (Future agenda items)

2.9 Status of Iridium NEXT

HEZAREH and van der MAREL reported about the meetings between CRAF and Iridium about the future protection of radio astronomy by the Iridium NEXT satellites and the discussions that took place on this topic at the WGFM, FM44, SE40 and Working Group Spectrum Engineering (WGSE) meetings.

At the 81st WGFM meeting in October 2014, CRAF indicated that neither of the protection schemes indicated by IRIDIUM about advance notification to the radio-telescopes would meet the

requirements of [ECC/DEC/\(09\)02](#) and that the only technical solution would be to continuously limit Iridium NEXT operations over Europe to their RASP modes with a maximum bandwidth of 6.5 MHz. CRAF's proposal was supported by the majority of participating administrations.

In order to help administrations develop a unified regulatory method to make IRIDIUM comply with ECC/DEC/(09)02, a questionnaire was developed by FM44. Information from 33 administrations on the licensing policies in Europe was collected and saved for reference.

IRIDIUM plans the launch of the first two NEXT generation satellites in October 2015. Full deployment of the new constellation of NEXT satellites is expected to complete by the end of 2017. IRIDIUM has promised that the new satellites will have an improved performance with respect to their unwanted emission levels. To investigate the validity of this claim, CRAF guided a proposal with the support of the Netherlands, Germany and Switzerland to the WGSE meeting in May 2015 to request a measurement campaign on the first new IRIDIUM satellites with the Leeheim satellite monitoring station in the beginning of January 2016.

2.10 CRAF Newsletter

The contents for the next newsletter (issue n. 29) was agreed upon:

- Editorial (HANS VAN DER MAREL)
- Report of CRAF56 and CRAF57 meetings (VINCENZA TORNATORE)
- Cognitive Radio - part 2 - (PETER THOMASSON)
- Radio astronomy activities in Finland (JUHA KALLUNKI)
- Solar Physics and Space Weather at Low Frequencies (PETER GALLAGHER & CHRISTOPHE MARQUE)
- LOFAR (HANS VAN DER MAREL)

2.11 Next CRAF Meeting

The next Annual General Meeting will be held in Helsinki (Finland) in Spring 2016.

2.14 Information of the EC financial contribution

The EU-project RadioNet3 has sponsored the CRAF Meeting on May 12-13, 2015 at Birr Castle Ireland. The local organisation was supported with 2200 EUR, additionally the travel expenses of 5 participants were supported in the total range of 1900 EUR:

- BOLLI P., Osservatorio Astrofisico di Arcetri, Italy
- JIRICKA K., Astronomical Institute in Ondrejov, Czech Republic
- TORNATORE V., Politecnico di Milano, Italy
- THOMASSON P., University of Manchester, Jodrell Bank Observatory, United Kingdom
- McCauley J., School of Physics, Trinity College, Ireland

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