

RADIO ASTRONOMY COMMITTEE (RAC) REPORT TO THE CASCA BOARD,
MAY, 2006

Submitted by J. Irwin on behalf of the RAC

1. MEETINGS:

The most recent meeting of the RAC was held via telecom on March 10, 2006. In attendance:

Judith Irwin (chair)
Peter Dewdney
Ingrid Stairs
Ken Tapping
Gary Welch
Guest: Martin Houde

2. ASSISTANT SPECTRUM MANAGER:

The RAC wishes to thank the CASCA board for their enquiries regarding an assistant and eventual replacement for Ken Tapping as Spectrum Manager. We were, however, disappointed in the response from HIA on this matter which is basically, 'no action at the present time'. We are quite concerned about the timescale required for bringing a new spectrum manager 'up to speed' on the issues prior to Ken's eventual retirement. This is not an area in which a new person can quickly and easily take over since spectrum management requires knowledge about many international issues, treaties, and protocols. Moreover, interference is moving to higher frequencies to include IR bands and not just radio ones and new technologies are continually coming on-line. Canadian astronomers need to be informed about these issues, a task that Ken has admirably taken care of over many years (e.g. Cassiopeia articles). The RAC has not had a chance to meet since the HIA response, so has no immediate action item for this report. However, this is an important issue, so should be revisited at the next RAC meeting. Suggestions from the Board are welcome.

3. EVLA REPORT:

Regarding the EVLA correlator, the correlator work is proceeding and, although there have been a few setbacks, there appear to be no show stoppers. The RAC would like to emphasize that the ALMA/EVLA telescopes make a powerful package and could be promoted together. To this end, the RAC sent a request to the organizers of the Victoria Summer School on (Sub)Millimetre Observing Techniques to see if the EVLA could be mentioned or included in some way. As a result, we note that Sean Dougherty will be giving a talk called "The Synergy of ALMA and EVLA" at this summer school.

4. SPECTRUM MANAGEMENT REPORT:

It is important to ensure that Industry Canada continues to be aware of the needs of Canada's radio astronomers and letters like the one recently sent to Industry Canada by the CASCA Board are very helpful in this process. ** The RAC wishes to thank the CASCA Board for sending the letter drafted by Ken Tapping to Industry Canada about controlled emission zones. **

The current situation again seems to worsen and constant vigilance and awareness is required in the goal to protect radio astronomy bands. In the lead-up to 2007 when international regulations are expected to be firmed up, the Americans are taking the view that there is now a 'regulations-free window' of opportunity within which to launch satellites without concern for spectral pollution and also without the need to notify those who are affected by it. There are other problems and aspects of this issue that need to be made known to Canadians and to others internationally, most of which is new information of which Ken Tapping has only just become aware. Since it is extremely important to advertise what is going on, Ken will be writing another Cassiopeia article describing the new interference threats. [see report in e-Cass, June 2006]

5. EDUCATION/OUTREACH:

The upcoming CASCA meeting in Calgary will, for the first time, have an undergraduate workshop and representatives from various universities will be present and active in graduate student recruitment. It was felt that it would be a good idea to have a display at that session highlighting the various radio astronomy projects with which Canada is involved. Ingrid Stairs will be attending this meeting and will set up a radio astronomy display.

6. JCMT:

The JCMT report is attached separately at the bottom of this document (Appendix A)

7. ALMA:

The ALMA report is attached at the bottom of this document (Appendix B). Note that the upcoming CASCA meeting will be high profile for ALMA.

8. SKA/CLAR:

A summary of events since the last RAC report follows.

A 'Reference Design' has been chosen internationally and the timeline is being driven largely by funding that has become available in Europe (FP7). Since their timeline is short (funding should start to flow in 2009 or late 2008) this has led to a conservative reference design. Canada is in a weak position over all because of our (so-far) inability to secure funding for the Canadian design concept. A document was circulated to all

RAC members prior to the meeting which outlines two possible scenarios for Canada -- one which is to develop a stand-alone CLAR and one which is to become involved more directly in one of the other scenarios (e.g. Australia). At a recent telecon of the SKA Consortium Board, it was decided that both options should be kept open for now. Since that time, there has been communication between Russ Taylor and Brazil, Argentina, and NAIC, all of whom have given a positive response to the concept of having a 4-way CLAR or CLAR-type instrument built in the southern hemisphere, probably Argentina. A meeting was held at DRAO in March at which representatives from NAIC would discuss this further.

This issue was discussed at some length by the RAC. The international situation is clearly in flux and it is very difficult to clearly point to one option or another as the 'best plan' for Canada. However, the RAC realizes that some difficult decisions need to be made within the next year or we may be left out in the cold on all fronts. Some points that were made during the discussion are as follows:

- Canada should play an important, not a minor role in whatever course is pursued.
- Canada needs to be very active on the short *and* long term; otherwise we will fall into a period of time in which the field (which is very exciting internationally) has stalled in this country. The interest of technical advantage to the county as well as appeal to graduate students, etc. depends on this.
- Concern was expressed about putting so much into a southern hemisphere CLAR that we will be out of the running for the 'real' SKA when/if it occurs.
- Concern was also expressed about the ability of NAIC to contribute meaningfully to a project, given the current situation in the US.
- Obviously funding is very important and is so-far non-existent.
- A southern hemisphere stand-alone telescope needs a clear strong science case. Although there is now a fully-described science case at www.clar.ca, such an instrument would also need a unique scientific focus that only it can achieve (or achieve better than anyone else).

The RAC felt that, at this time, it is best to present these issues as a set of principles for guidance as to the eventual, and hopefully best, decision. The RAC also notes that there will be a meeting of the SKA Board on June 1/06.

APPENDIX A: JCMT REPORT

1. Telescope shutdown. The telescope was closed in mid-February 2006, and is expected to reopen in mid-August. The purpose of the closure is to install the infrastructure necessary to support SCUBA-2.

2. Truncated Semester 06B. A call for proposals is expected shortly, with a probable deadline of 15 April. As far as I am aware, only heterodyne instruments will be available to outside users (except possibly for visitor instrument AzTEC?).

3. Status of the new instruments

HARP - Commissioning work was in progress when the telescope was closed last month, and should be completed in time for semester 07A, and perhaps even earlier. There will possibly be an opportunity for shared-risk observations in semester 06B. That leaves the current receivers A3 and B3 to continue as the workhorses.

SCUBA-2 - Progress is steady, although delayed. There are no show-stoppers yet! It is estimated that the instrument will be available to the community in semester 07B.

4. JCMT science archive. Looking ahead to the era of large surveys and huge data piles, arrangements are being made to expand the role of CADC, which is currently a repository of archival data. In the future, new JCMT observations will be downloaded directly to the CADC, from which observers will be able to obtain both raw and processed measurements. It's not clear to me if observers will have the option of carrying away their own data right from the telescope. PPARC, the UK's equivalent of NRC, has funded a new programming position at CADC to assist the process.

5. Strategic review. This was requested by the JCMT Board in order to buttress the case for extending telescope operations past the end of the Tripartite Agreement in 2009. A Review Panel chaired by Martin Harwit visited the JAC last September, and the Board formally received the resulting report in an extraordinary meeting held on 13 October 2005. In short, the report was very positive. At the moment, the three funding agencies (UK, Canada, Netherlands) are seeking moneys to enable a 3-year extension to 2012.

6. Possible 20th anniversary conference. Gary Davis is considering hosting a conference to celebrate 20 years of JCMT science.

7. eSMA project. This is still a priority for the JCMT Board, and is therefore proceeding. A workshop has been proposed for sometime in 2006 in the Netherlands to promote joint science programs for pilot eSMA observations.

[for more up-to-date information, see the JCMT website]

APPENDIX B: ALMA REPORT

The ALMA project has continued to make progress on a global scale since we last met via telecon in mid-November 2005. [a detailed report was presented to the Board; for up-to-date information, read the continuing series of articles in e-Cass.]

A conference open to all interested astronomers entitled "Science with the Atacama Large Millimeter Array" will be held 13-16 November 2006 in Madrid, Spain. This will be the first ALMA-specific science conference since the one held in Washington, DC back in October 1999. (See <http://www.oan.es/alma2006/> for more information.)

Adrian Russell, formerly the Director of the UK Astronomy Technology Centre (UK ATC) at the ROE in Edinburgh, has been named acting Head of the North American ALMA Science Center in Charlottesville, VA. John Hibbard of NRAO has been named acting Head of the North American ALMA Regional Center, which is a subset of the NAASC that focuses on the core activities expected by the ALMA project. Canada's obligation will be to provide 7.25% of North American ALMA operations, and we are exploring ways to optimize our Canadian contributions.

At HIA-Victoria, the Band 3 (3mm) receiver project has been making significant progress. Noise temperature testing of the "No. 2" cartridge was completed in mid-January and showed the noise temperature across the band is on average 7 K below ALMA specifications. Three other tests (beam pattern, long term phase drift and gain compression) will occur over the next 6 months. The "No. 2" cartridge will be the first deliverable, and there will be Test Readiness and Preliminary Acceptance In-house reviews at the end of April. The "No. 1" cartridge will be redone, and will be the second deliverable.

In Victoria, HIA will convene a 4-day "Submillimeter Astronomy Summer School" in August 2006 for students or postdocs to learn about submillimeter (radio) astronomy basics and upcoming observational opportunities, e.g., with JCMT, SMA, ALMA or Herschel. An announcement for registration will be submitted to the CASCA exploder probably within the month.

At the Calgary CASCA meeting, Canadian Project Scientist Christine Wilson will provide a 1 hour review of ALMA on Saturday, June 3. The AAS meeting this year overlaps with the CASCA meeting on Sunday, June 4. On Monday, June 5, there will be a special 1.5 hour session entitled "Imaging Star Formation in the Cosmos with ALMA" organized by John Hibbard. This session will include review talks by Doug Johnstone (NRC-HIA), Jean Turner (UCLA) and Andrew Blain (Caltech) about ALMA's capabilities for star formation within our galaxy, nearby galaxies, and high-z galaxies respectively. There will likely be a specific ALMA booth at the AAS meeting.