

ATNF ATUC MEMORANDUM

To: ATUC
From: Warwick Wilson
Date: 2 June 2004
Subject: Technology Development Report

Highlights

- Delivery and installation of the Arecibo Multibeam receiver on schedule in April.
- Installation of a prototype polyphase digital filterbank at Mopra in May. The system currently has 1024 channels over 256MHz bandwidth on each of two polarisations. This is a major step forward in the development of the 2GHz bandwidth filterbanks for the ATCA broadband upgrade.
- The joint ICT/ATNF NASA DSN array studies project has produced new concepts for array beam forming and correlation, which have now been adopted by NASA for their prototype DSN array.
- Good prospects for NASA contributing to production of 7mm ATCA receivers, in return for a small amount of DSN tracking time, starting probably mid to late 2006.

Revised schedules

- Some delays in mm-wave receiver production will mean that 3mm will not be available on the ATCA before late July. Latest update will be given at ATUC meeting.
- 6GHz multibeam receiver installation at Parkes now scheduled for early in the April 2005 observing term. Jodrell Bank partners have agreed to this schedule.
- Mopra 8GHz spectrometer and new mm-wave receiver for Mopra, with projected frequency coverage up to 115GHz, now scheduled for installation in time for 2005 mm observing session.

New Projects

The following new projects were approved by the ATNF Projects Board in December 2003 and March 2004.

- All-sky epoch of re-ionisation experiment.
- Delay tracker for the ATCA wideband analogue correlator.
- Pulsar digital filterbank
- GMRT feed development
- Additional 8MHz filters for the Parkes multibeam correlator.

EU FP6 Collaboration - PHAROS

ATNF and ICT are collaborating in the EU FP6 PHAROS program, aimed at developing focal plane array systems for large antennas, in the frequency range 4 to 8 GHz. ATNF's commitment, of approximately 1 FTE, is in the areas of signal processing, MMIC development and software, and is largely common to work being carried out in other projects.

Emerging Science Program

ATNF has applied for special funding under the CSIRO emerging science program. In the technology development area, the proposal includes funding for a study of line feeds for cylindrical reflectors and a design study for a focal plane array receiver, nominally for the Parkes telescope. ATNF expects funding to be available from July 2004 for both of these activities, initially at the 1FTE level in each.

Advice sought

ATUC's advice is sought on the following issues/questions:

As mentioned above, ATNF's emerging science program includes a design study for a focal plane array receiver. This is initially aimed at a conceptual design of a practical and scientifically interesting FPA system for an ATNF telescope. The 4 to 8 GHz band chosen by PHAROS is seen to be not particularly interesting in terms of the science it could do. A 12mm FPA for Parkes has been proposed in the past and may be a good prospect. Are there better alternatives?