The Australia Telescope National Facility – Recent Upgrades and Future Plans

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The Australia Telescope National Facility (ATNF) comprises the Australia Telescope Compact Array (ATCA), Parkes Telescope, Mopra Telescope, and will include the Australian SKA Pathfinder (ASKAP) that is currently under construction in Western Australia. Upgrades to the ATCA and the Parkes Telescope will continue to provide unique capabilities even as ASKAP comes on line. Observing time is allocated based on scientific merit. Proposers may be from any country.

A major upgrade of the Australia Telescope Compact Array is nearly complete. As part of the upgrade, new receivers are being fitted that cover nearly the entire band from 1–12 GHz. Total system temperatures are below 20 K over most of the band. Measurement of transistor characteristics at cryogenic temperatures have led to better modelling and more certainty in the behaviour of the final low noise amplifiers that cover three octaves. A new orthomode transducer has enabled operation of the input signal waveguide to match that of the amplifiers in the 4–12 GHz band. A new correlator, the Compact Array Broadband Backend (CABB), based on FPGA technology, is providing instantaneous bandwidths of up to 4 GHz per polarisation and up to 32,768 channels at resolutions to 0.5 kHz. The correlator enhances the broadband receivers that already exist up to 100 GHz. The ATCA will remain an observer-operated telescope, with observing at the telescope site.

The Parkes Telescope is being reconstituted into a telescope focused on large projects with a limited number of observing modes, supporting remote observing. Remote observing with the Parkes Telescope will begin in late 2012. In order to maintain most capability at reasonable cost, new ultrawideband receivers covering 0.6 to 20+ GHz have been proposed, along with a cooled phased array feed covering 0.7 to 1.8 GHz. Users for Parkes and the ATCA will be accommodated at the Science Operations Centre in Marsfield (Sydney), Australia. ASKAP observing will be done in service mode.

We will describe recent progress and planned instrumentation for the ATNF telescopes.