The Australian SKA Pathfinder – an update

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The Australian Square Kilometer Array Pathfinder (ASKAP) was opened on 5 October 2012 and will be the fastest cm-wave survey instrument in radio astronomy. ASKAP will consist of 36 12-meter 3-axis antennas, each with a large checkerboard phased array feed (PAF) operating from 0.7 to 1.8 GHz, and digital beamformer preceding the correlator. The 96 dual-polarization elements (192 receivers) of the PAF and the subsequent beamformer will provide about 30 beams (at 1.4 GHz) to produce a 30 square degree field-of-view, allowing rapid, deep surveys of the entire visible sky. The large data-rates involved (~ 2 Tb/sec per antenna) and the need to do pipeline processing has led to the antenna incorporating a third axis to fix the parallactic angle with respect to the entire optical system (blockage and phased array feed).

The first antenna was deployed at the MRO in late 2009, and the last was commissioned in June 2012, with installation of receivers, beamformers and the correlator underway.

The site of ASKAP is the Murchison Radio Observatory, 315 kilometres north east of Geraldton, Western Australia, a new radio-observatory being developed as an SKA-ready site. The primary infrastructure construction is now complete, including installation of the fiber connection from the MRO site to Perth via Geraldton (with the full cable appropriate for the SKA). In addition, a unique geothermally cooled, RFI control compliant control building to house the sophisticated digital systems has been completed, and fitout has commenced. A novel hybrid diesel-solar power station to provide power for the observatory is also under development.

CSIRO is now in the process of installing the receiver and support electronic systems and has commenced early commissioning. A description of the ASKAP system, future planned developments and SKA implications will be presented, along with early commissioning results.