

# MeerKAT passes Preliminary Design Review with flying colours

“The panel unanimously concludes that the PDR has been successfully passed and congratulates the project teams.” These were the findings of the panel of international experts who conducted the Preliminary Design Review (PDR) for the 64-dish MeerKAT array during July 2011.

The PDR is an important milestone, verifying that the system design satisfies the system requirements. It establishes the design baseline, from which the requirements of the various subsystems are derived.

To give the panel an insight into the geographic location of the telescope in the vast open spaces of the Northern Cape, and to demonstrate the progress that has been made at the site, they visited the KAT-7 site, as well as the Losberg complex and the support base at Klerefontein.

“We are extremely impressed by the quality of the project team, and the continued tremendous progress in realising KAT-7 and bringing MeerKAT to its current stage,” they declared in their report.

The expert review panel was chaired by Marco de Vos (ASTRON, Netherlands), and other attending members were Rick Perley (NRAO, USA), Tim Stevenson (SPDO, UK), Peter Hall (CIRA, Australia), Paul Alexander (Cambridge, UK), and Thijs de Graauw (ALMA, Chile). The panel also included Dr Yashwant Gupta (GMRT, India) who could not take part in the visit, but contributed to the PDR via correspondence.



## PAPER array extended to 64 dishes

After a very successful deployment, the Precision Array for Probing the Epoch of Reionisation or PAPER experiment is now a proud 64-antenna array. Collaborators from the US (National Radio Astronomy Observatory and Universities of Virginia, Berkeley and Pennsylvania) gathered in the Karoo to accomplish this feat within a mere three week timeframe.

The recent deployment involved the assembly and installation of an additional 26 dipole antennas constructed from parts shipped from the USA. New antenna positions were accurately marked during a previous deployment, with the array being in a minimum redundancy configuration to optimize image quality. Subsequently, 100's of metres of overground cables were carefully laid to the central computing container in such a way as to

avoid cable cross-talk, and simplify the process of array reconfiguration. Furthermore, new analogue receivers were installed and the digital backend was upgraded, featuring a new 64-input ROACH-based correlator.

Concurrent with the deployment, two essential additions were made to the PAPER infrastructure. Grid electrical power, conditioned via a UPS system at the KAT-7 site, has now replaced a diesel generator. Together with this, a fibre optic data cable was installed along a 2 km trench to the nearest KAT-7 infrastructure. This data link will enable remote monitoring and power cycling of the instrument, and also allow distant scientists to download data fragments in order to evaluate the instrument's performance whilst data is recorded to a bulk storage unit within the computing container.



“Scientists who will be using PAPER were very impressed with preliminary images from the instrument, proving that the Karoo region is ideal for this type of research,” says William Walbrugh, junior project manager for PAPER based at the MeerKAT office in Cape Town. “We plan to extend PAPER to 128 antennas by 2013.”



Intern technicians from the Hartebeesthoek Radio Astronomy Observatory helped to install the new PAPER antennas – they are (ltr) Monde Manzini, Raphael van Rensburg and Khulekhani Zulu.