

## News Release



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## South Africa's MeerKAT a centre of international attention

09 March 2011 16:26 South African Square Kilometre Array Telescope Project Office

South Africa is building the Karoo Array Telescope (MeerKAT), which is a precursor instrument for the Square Kilometre Array, but will in its own right be amongst the largest and most powerful radio telescopes in the world. MeerKAT is being constructed adjacent to the site proposed for the SKA near the small town of Carnarvon in the Northern Cape Province. The MeerKAT will develop and test technologies appropriate to the SKA, including the use of composite, one-piece reflectors, single-pixel wide-band receivers, low-cost, high-reliability cryogenic systems, and reconfigurable digital processing systems.

Following the successful building and testing of a very innovative prototype dish made from composite materials, the MeerKAT team has built the KAT-7, a seven-dish prototype interferometer array in the Karoo. This has been constructed ahead of schedule and is operating very successfully in the commissioning phase. The construction and commissioning of the full MeerKAT array will follow at the same site. A high speed data network will link the telescope site in the Karoo to the control centre in Cape Town. An interim 10Mb/s line is in place between the site and Cape Town and a 10Gb/s line will be in place by June 2011.

A new geometry has been adopted for the dishes of the MeerKAT array to augment the efficiency of the receivers. The KAT-7 dishes are conventional, 12-m-diameter, parabolic-shaped dish, with a feed, held by four-supporting legs, at the focal point above the centre of the dish. The new antenna geometry will have a clean optical path - a Gregorian offset design -with a primary reflector of 13.5 m and a smaller concave secondary reflector. The Gregorian offset dish gives better images and is likely to be the geometry adopted for the dishes of the SKA.

MeerKAT will have 64 dishes. A prototype offset Gregorian dish will be built in the Karoo during 2012. All 64 dishes will have been manufactured and installed by the 2016, but early science will start before that, when there are sufficient dishes in place (during 2015),

The MeerKAT is already in great demand by the international astronomy community. Twenty-one international teams, including five hundred scientists, responded to a request for proposals for large observing surveys with the MeerKAT. An international Time Allocation Committee has recommended two top priority programmes and eight others and these programmes have been awarded in all nearly five years of observing time. Some of the researchers are South Africans: others researchers are from India, the USA, the UK, the Netherlands, Australia, Germany, Italy, France, Canada and other countries.

The MeerKAT is being designed and built by the SKA South Africa team in Cape Town, collaborating with South African industry and universities and international partners. Key South African industry partners are; EMSS, a Stellenbosch company which works with the team on innovative receivers, radio feeds and cryogenics; Tellumat, which is working on the manufacturing of boards and receivers and MMS and BAE Land Systems, which have built the composite dishes; Eskom, the national electric power utility; Optic 1, which built the power and optical fibre cables to the site; Broadband InfraCo, which is connecting the site to Cape Town and the world and MESA Solutions, working on electromagnetic compatibility.

