

MeerKAT takes shape

By Leon Engelbrecht

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Preparatory construction work is under way at a site near Carnarvon, in the Northern Cape, that will host the first phase of the MeerKAT radio telescope project by the end of next year.

While an access road is being built to the site and utilities are being provided, government officials, scientists and engineers are gathered west of Pretoria today for a two-day conference to strategise SA's bid for the "world's largest ICT project".

SA is in the running – with Australia – for a billion-euro Square Kilometre Array (SKA) radio telescope.

SKA project leader Dr Bernie Fanaroff says should SA win the bid, the bulk of the arrays will be built at the MeerKAT site. The SKA will have outstations as far as 3 000km away and partner states to host these include Botswana, Ghana, Tanzania, Kenya, Madagascar, Mauritius, Mozambique and Namibia.

"We have invited the heads of the relevant government departments and their experts here to plan the SA bid and to plan how we will establish stations in these countries if we win the bid," Fanaroff says.

"We want an African strategy to win the bid, but we also need to discuss the implications of winning that bid."

He adds that SA has already passed legislation to safeguard the Carnarvon area from radio frequency interference and that it wants "some kind of regulation" in the partner countries "so that the areas selected are kept radio-quiet".

A decision on where to place the SKA will be made in 2011, building work will start in 2013 and a space science is scheduled to commence at the site in 2015, although construction will only be complete by 2020.

2012 target

Fanaroff says MeerKAT is both an SKA "pathfinder telescope" and an indigenous initiative to build a hi-tech, world-leading centimetre-wave radio telescope that will set a standard for many years.

South African scientists and engineers began the design, development and construction of MeerKAT four years ago, in collaboration with colleagues at Cambridge, Oxford, Manchester, The University of California at Berkeley, Caltech, the Netherlands Institute for Radio Astronomy and others.

MeerKAT will be complete and in service by late 2012 and will consist of up to eighty 12m antennas – although the final number of antennas to be built remains subject to budget constraints.

At present, a prototype 15m antenna built by ICT vendor IST for both MeerkAT and SKA is undergoing testing at the Hartebeesthoek Radio Astronomy Observatory, northwest of Johannesburg.

The antenna is the largest ever built from composite material and was manufactured to a South African design.

Fanaroff's office says tests on this antenna have helped improve the design and seven optimised 12m antenna will be constructed for the initial MeerKAT dish array that will stand in the Karoo by late next year.

The SKA project office says this approach is being followed to maximise the scientific output and minimise risk.

Track record

"We have made a lot of progress since starting to bid in 2003. The feeling was you can't build anything as complex as this in Africa, but we've brought scientists here and showed them that in fact you can," Fanaroff says.

He adds that South African scientists are already involved in the High Energy Stereoscopic System (HESS) gamma ray radioscope, in southern Namibia. "This is a collaboration with Namibian, German and other European scientists" and they are "doing very exciting work".

HESS consists of four radiosopes at a site on the Khomas Hochland, south of Windhoek, and SA contributed R30 million to its construction. It became operational in 2002.

More recently, SA helped design and build the Southern African Large Telescope, at Sutherland, near Carnarvon, in the Northern Cape. "Everyone was amazed at how quickly and efficiently we built that," says Fanaroff.

SA contributed about a third of the \$36 million the wikipedia says the facility cost to build and operate.

Fanaroff adds that SA has been conducting astronomy for "several centuries" in the Cape; MeerKAT and SKA simply build on this foundation.

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