

**Deep space plan:** possibility of two new telescopes for SA

# Cape could lead the world with window on universe

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SOUTH AFRICA is in line to become the Earth's eyes and ears in deep space, with the Northern Cape being earmarked as a possible location for two huge new projects.

The American space agency Nasa and an international astronomical committee are both considering using the Northern Cape as a base for investigating deep space.

Of these, by far the largest is the Square Kilometre Array (SKA) radio telescope which will be the biggest scientific instrument on Earth when completed. South Africa and its partner countries as far north as Ghana have submitted a bid to host the €1 billion device.

The SKA would look at the universe when it was very young, about 500 million years after the Big Bang.

It would be able to see how the earliest stars and galaxies formed and how they have evolved over an estimated 14 billion years.

The Nasa project for a Deep Space Network station would be used for command and control of the space agency's deep space vehicles and to get data from deep space.

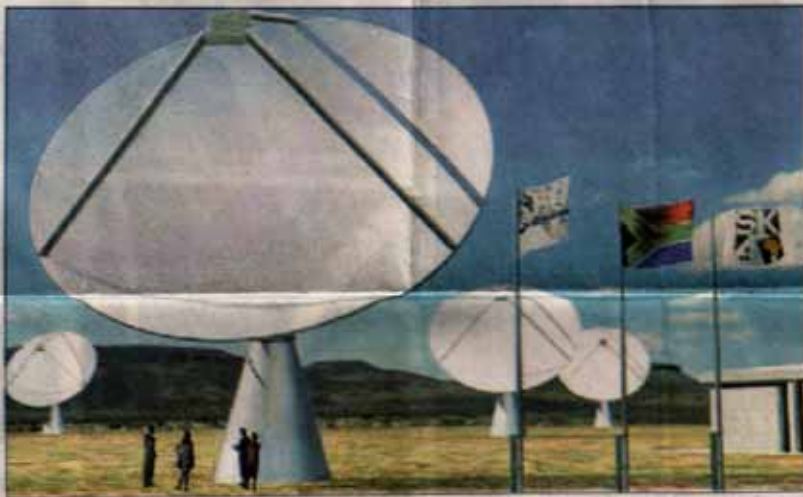
Such a station would be in touch with space probes such as the one currently en route to Pluto.

The SKA has an international steering committee that includes the United States, Britain, other European Union members, China, Australia and South Africa.

A prototype of this telescope is to be built in the Karoo by the South African government to develop and test the new technology.

Nasa plans to build a Deep Space Network Array of satellite dishes communicating with their deep space probes on missions to the Moon and further into the solar system.

South Africa's proposal to use the Northern Cape for the SKA radio tele-



**Watching:** an artist's impression of the planned radio telescope complex for the Northern Cape, which will be the biggest scientific instrument on Earth when completed.

scope was submitted at the end of last year and the steering committee was told that the SA site bid, along with those from Australia, Argentina and China, were being considered.

The telescope gets its name from its overall collecting area of dishes which will be a million square metres, about the same as one million DSTV dishes. They will all function as a single telescope.

Bernie Fanaroff, project manager of the SKA in South Africa who also heads the Nasa bid, said, "Instead of having one massive dish you have an area of about 4 000 dishes connected via fibre optic cable to one computer so they work as one dish."

There would be 125 dishes scattered over 3 000km, mostly in the Northern Cape, but with outlying stations as far away as Namibia and Mozambique, and even Ghana and Kenya.

Fanaroff said they submitted their site bid to the International SKA Project Office at the end of December.

"A committee of scientists will then meet and rank the bids according to various criteria by September this year. Then these recommendations are taken to the government funding agencies ... before reaching a final answer by 2008."

Basing the SKA in the Southern Hemisphere has big advantages over the Northern Hemisphere.

"You can see the centre of our galaxy, the Milky Way, much easier from the Southern Hemisphere than you can from the Northern," Fanaroff said.

Justin Jonas, project scientist, explained that a sparsely populated area was necessary for effective radio astronomy.

"If there are less people, there will be less radio waves, cellphones and all such interferences."

Jonas said the SA government's positive stance and support of astronomy projects such as Salt (the new Southern African Large Telescope in Sutherland) improved the chances of winning the bid.

"There are numerous benefits for the country; the estimated cost is around €1bn and a good fraction of that could come into South Africa and about 5% of that is estimated to be the annual running cost of the project that has about a 60-year lifetime."

A scaled down version of the SKA would be built in the Karoo as a prototype for the larger instrument, said Jonas, adding that it would most likely be completed by 2009.

Cape was also ideal for radio astronomy.

"It is 40% of the land and only 2% of the population so there is so little radio noise. A lot of radio noise is equivalent to having a dirty sky when using a light telescope."

These attractions have also prompted the National Research Foundation to approach Nasa with suggestions for a site for their Deep Space Network Array.

The installation would use a similar concept to the SKA but is intended to be used for communication with deep space probes.

The Nasa project would be based in a different part of the Northern Cape, said Fanaroff, and the two would not interfere with each other.

Nasa currently has three Deep Space Network stations around the world: one in California and one each in Spain and Australia.

Fanaroff said a Nasa technical team had visited South Africa last year and inspected several sites around Springbok and Upington.

"Currently Nasa can only receive photographs and other data using its Deep Space Network, but that is travelling very slowly and they wanted to upgrade that network to allow them to get photographs faster and even start streaming video along with the other information they send from the probes like the one going to Pluto," said Fanaroff.