Telescope could blast SA into world league

By Wendell Roelf

Cape Town - South Africa could be at the forefront of unlocking the secrets of the universe and solving one of the greatest scientific conundrums if an attempt to host the world's largest radio telescope is successful.

On Monday, a delegate from the local bid team for the Square Kilometre Array (SKA) radio telescope handed over the country's final bid in Holland.

"It's the biggest radio telescope that's ever been planned. It will be built by an international consortium consisting of governments and institutions in Europe, Asia, North and South America, Australia and South Africa" said Bernie Fanaroff, project manager of the bid.

'It's the biggest radio telescope that's ever been planned'

Fanaroff said the radio telescope looked at radio waves emanating from the universe, unlike the southern hemisphere's largest single optical telescope, Salt in Sutherland, which looked at light waves.

The main intention of the radio telescope would be to look at the universe when it was very young, about 500 million years after the Big Bang, before the stars and galaxies formed.

It would be able to see how the earliest stars and galaxies formed and how they have evolved over the age of the universe. The universe is approximately 14 billion years old.

Fanaroff said the SKA would also tackle the composition of the universe, recently shown to consist mainly of "dark energy" and "dark matter", which scientists cannot explain.

These elements form 96 percent of the known universe, with the remaining four percent consisting of matter, anti-matter and "ordinary" energy.

'What is dark matter?'

"One of the main priorities will be to solve the fundamental scientific problem of what is dark matter, and what is dark energy."

Fanaroff said China, Argentina and Australia were competing against South Africa to host the SKA. As well as the main bid document, all four will submit a supplementary report measuring radio interference, which will be handed in to the international SKA offices in Holland in March.

He said the proposed site was in the Karoo, near the towns of Carnarvon and Williston.

The telescope would consist of 4 500 satellite dishes dotting the landscape, linked by optical fibre cables which would feed the data into a site in the Karoo and to a high performance computer in Cape Town for processing of images such as pulsars and galaxies.

It would be scattered over 3 000km, mostly in the Northern Cape, but with outlying stations up to the country's borders, and in neighbouring countries such as Namibia and Mozambique, extending as far afield as Ghana and Kenya.

"If you imagine one million DSTV dishes all linked together and feeding into one computer," explained Fanaroff.

He said the sites chosen were good sites with very few people, protection from radio interference caused by cellphones and television, and situated over 1 000m above sea level where there was very little cloud and water vapour.

Support from government was also a crucial factor in the bid.

"Government has taken a deliberate decision to promote Southern Africa as a hub of astronomy in the world."

Fanaroff said the government had undertaken to ensure the availability for the SKA of the world's fastest optical fibre network - capable of transmitting data at one terrabit a second, or a million times faster than the standard broadband available in South Africa.

A final decision on the successful bid is expected from an independent panel in 2008. - Sapa

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