

THE 7:30 REPORT



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Australia vies for radio astronomy base

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Australia and South Africa are the two short listed nations where the so called "square kilometre array" telescope will be built - a piece of scientific equipment so ambitious in scale scientists struggle to explain its capacity to gather information. If Australia is successful it will be the world's centre of radio astronomy for the next century.

Transcript

KERRY O'BRIEN, PRESENTER: The 40th anniversary of the Moon landing was a splash celebration in America, but Australia also had a stake, particularly CSIRO scientists involved with the radio telescopes that helped broadcast the sounds and sights from space. But while the organisation can look back with pride, it's also looking forward to the next generation of radio telescopes. Australia and South Africa are the two shortlisted nations where the so-called Square Kilometre Array Telescope will be built, a piece of scientific equipment so ambitious in scale, scientists struggle to explain its capacity to gather information. If Australia is successful, it could be the world centre of radio astronomy for the rest of the century. Mike Sexton reports.

BRIAN BOYLE, CSIRO NATIONAL TELESCOPE FACILITY: It was Haldane who said the universe is not only queerer than we imagine, it's queerer than we can imagine.

JOHN SARKISSIAN, CSIRO PARKES OBSERVATORY: In radio astronomy Australia leads the world in that, and the world looks to Australia for leadership. ... When we build the Square Kilometre Array in Australia, what uses it'll be put to that we can't imagine at the moment.

MIKE SEXTON, REPORTER: It's the type of project scientists dream of, a once-in-a-century opportunity to build the world's most powerful telescope, point it into space and start finding answers to some of the biggest of questions.

LEWIS BALL, CSIRO NATIONAL TELESCOPE FACILITY: Such as the cradle of life, understanding how - better how life actually forms, understanding the creation and evolution of galaxies, understanding the origin of magnetism in the universe.

MIKE SEXTON: The instrument that can do this is called the Square Kilometre Array, or SKA. It isn't one telescope, but rather several thousand antennas spread over 3,000 kilometres. But because they will operate as one instrument, they give coverage of the equivalent of one square kilometre and survey the heavens 10,000 times faster than anything currently operating.

BRIAN BOYLE: Here we are with a telescope that we're looking in order to process one million million million bytes of information every day, we're looking to transport, process, store and recover that information. I mean, that's equivalent to the total output of new information that humanity generates in a month.

MIKE SEXTON: The project is a global collaboration involving 17 countries and will cost up to \$3 billion, with Australia and South Africa now the two countries shortlisted to host the telescope. Australia's bid is centred on a remote site in Murchison in mid-west of Western Australia, with scientists arguing it's one of the world's quietest places.

BRIAN BOYLE: There are not a lot of people in Western Australia. In the particular shire that the corner of this telescope will be based, Murchison Shire, Murchison Shire has 111 people and it has the size of the Netherlands. So it has a population density, if you like, of three nanopeople per square metre. So it's one of the most isolated places on Earth.

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MIKE SEXTON: But before it uses the SKA to solve the origin of the universe, the CSIRO has to convince the consortium they can build it. And part of its pitch is its successful track record.

This year, Australia's involvement in the Apollo II Moon landing was celebrated at various radio telescope sites around the country, most notably at Parkes in western NSW, where much of the lunar landing was broadcast to the world. The telescope there, affectionately known as the dish, gave the CSIRO world-leading expertise.

JOHN SARKISSIAN: The reason why NASA came to the CSIRO in 1969 to support the Apollo 11 mission was because we led the world in radio-astronomy, we had the best and sensitive radio telescopes, the best equipment and so on. And that's why they came to us. And we want to continue that leadership position.

MIKE SEXTON: At Parkes, in the shadow of the dish, is a smaller test-bed antenna which is part of Australia's bid for the SKA. At the cost of \$110 million, what is called the SKA Pathfinder will have only one per cent of the capability of the SKA, but scientists hope it will show Australia is still leading in this technology.

LEWIS BALL: We're certainly living on our reputation, but ultimately, we're living on our expertise. The fundamental ability to operate systems like this is crucial to the future, and so Australia is certainly building on that legacy, no question.

MIKE SEXTON: But it isn't only the scientific community that's licking its lips at the thought of the world's most powerful telescope being built here.

GLENN WIGHTWICK, IBM CHIEF TECHNOLOGIST: We've worked in this sort of space on a number of different projects around the world and we find that these sort of large, complex and challenging problems are sorta great ways to prove the technology, and ultimately, the value flows into the things we do in a more sorta commercial domain.

MIKE SEXTON: Glenn Wightwick is IBM's chief technologist in Australia and heads an international team trying to solve the computation requirements of the SKA.

GLENN WIGHTWICK: We have to get it from 3,600 antennas, some of which are gonna be in very remote locations and we have to very carefully coordinate the time that the information's collected so that we can kind of assemble it all together and generate images. And then we have to store and manage that data and make it available to astronomers.

MIKE SEXTON: For IBM, the attraction of the SKA is the likely spin-off in lucrative technologies such a project will create. The company points to the formation of the World Wide Web that occurred as the result of the particle physics laboratory in Switzerland, while the CSIRO patented what is the heart of wireless technology as the result of work in radio-astronomy.

BRIAN BOYLE: The chances for not only significant industrial spin-offs, but major societal impact is also huge.

MIKE SEXTON: In the next few months, groundbreaking will begin in Western Australia. The international consortium will make its decision in 2013 whether or not Australia will host the SKA. If it does, then within a decade it will be scanning the heavens, 60 years after the original dish pushed Australia into the forefront of radio astronomy.

JOHN SARKISSIAN: When the telescope was built in 1961, it was before Kennedy had decided to go to the Moon. But the telescope was ready for it. So who knows? In the future, when we build the Square Kilometre Array in Australia what uses it'll be put to that we can't imagine at the moment. But we'd like to think that we'd be ready for it.

KERRY O'BRIEN: I think you could say that's thinking big. Mike Sexton with that report.