Aussies and Kiwis forge a cosmic connection

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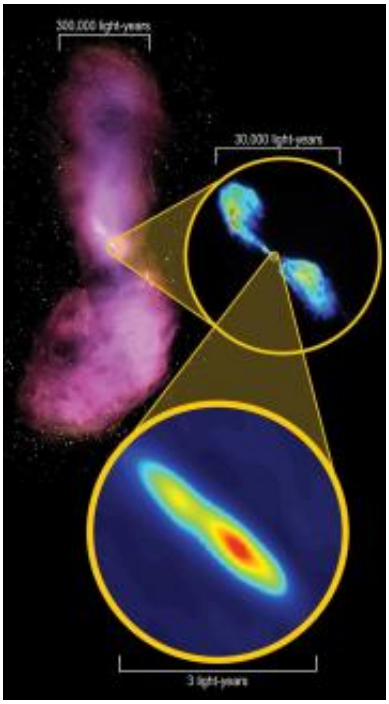

Zooming in to the heart of galaxy Centaurus A, 14 million light-years away. This composite image shows the entire galaxy, as imaged by CSIRO radio telescopes; radio emission from a central part of the galaxy, imaged by a US radio telescope; and the innermost part of the galaxy, imaged by the new network of Australian and New Zealand radio telescopes. Image credit - Whole galaxy: I. Feain, T. Cornwell & R. Ekers (CSIRO/ATNF); ATCA northern middle lobe pointing courtesy R. Morganti (ASTRON); Parkes data courtesy N. Junkes (MPIfR). Inner radio lobes: NRAO / AUI / NSF. Core: S. Tingay (ICRAR) / ICRAR, CSIRO and AUT

Six radio telescopes across Australia and New Zealand have joined

forces to act as one giant telescope, linking up over a distance of 5500 km for the first time.

The link-up was a collaboration between CSIRO's Astronomy and Space Science division, the International Centre for Radio Astronomy Research at Curtin University of Technology in Western Australia, and AUT University in New Zealand.

The linked telescope will make images ten times more detailed than those of the Hubble Space Telescope and has already been used to peer into the heart of a galaxy called Centaurus A.

Showing Australia and New Zealand can link telescopes this way strengthens the two countries' joint bid to host the international Square Kilometre Array (SKA) telescope.

"The SKA is a truly mega-sized science project with its global reach, scale and ambition, akin to the Large Hadron Collider in Europe," said CSIRO SKA Director Dr Brian Boyle.

"This successful linking of antennas shows Australia and New Zealand's commitment to next-generation astronomical research and how seriously we are taking the SKA bid."

The giant $2.5 billion SKA will have several thousand antennas, up to 5500 km apart, working together as one telescope.

Fifty times more sensitive than today's radio telescopes, the SKA will scan the cosmos for black holes, star formation and magnetic fields in space.

Australia and New Zealand are one of two regions shortlisted to host the SKA. The other is Southern Africa. A decision is expected in 2012.

The newcomers to the Australasian telescope team are the New Zealand dish, near Warkworth in the hills of the North Island, and a new CSIRO dish in Western Australia's red dirt country, inland from Geraldton.

The new CSIRO dish is the first antenna of the Australian SKA Pathfinder radio telescope.

The Warkworth dish is operated by AUT and is the first functioning research-quality radio telescope in New Zealand.

Data from New Zealand radio telescope were transferred from Warkworth directly to Australia using recently established 1 Gb per second connectivity via the Kiwi Advanced Research and Education Network (KAREN).

"The linking of the Warkworth antenna is a milestone for New Zealand science," said the Director of the Institute for Radio Astronomy and Space Research at AUT, Professor Sergei Gulyaev.

"It shows that Australia and New Zealand can achieve the SKA's ambitious science goals."

The other telescopes used in the link-up were three CSIRO facilities in New South Wales and a University of Tasmania dish near Hobart, Tasmania.

One of the linked telescope's first projects has been to study the heart of a galaxy called Centaurus A.

Lurking there is a black hole that shoots out jets of radio-emitting particles at close to the speed of light.

Observing for the galaxy for 10 hours, the telescopes took enough data

to fill a stack of DVDs in their cases as high as a nine-storey building.

The International Centre for Radio Astronomy Research at Curtin University of Technology provided the equipment for recording the data and also analysed the data to make an image.

The resolution of the new image is 100,000 times higher than that of a ground-breaking radio image made by CSIRO last year, which is itself the most detailed image ever made of the whole galaxy.

"Centaurus A is 14 million light-years away," said Curtin University's Professor Steven Tingay, a radio astronomy expert. "We're zooming in on the black hole at the heart of this galaxy, to learn about how these systems work.

"Making the new image has been like photographing a pin head from 20 km away."

Provided by CSIRO