

Radio-astronomers form telescope the size of Earth

January 13 2009



Telescopes and networks used for the e-VLBI observation.

(PhysOrg.com) -- Radio telescopes around the world will join forces this week to carry out a unique observation of three quasars, distant galaxies powered by super-massive black holes at their cores.

The nearly continuous 33-hour observation will be conducted on Jan 15-16 as part of a demonstration at the opening event for the International Year of Astronomy 2009 (IYA 2009) in Paris.

17 telescopes in Asia, Australia, Europe, North America and South America, including several operated from The University of Manchester's Jodrell Bank Observatory, will take part in the mammoth project.

Arpad Szomoru, Head of Technical Operations and R&D at the Joint Institute for VLBI in Europe (JIVE) noted, "The unique aspect of these observations is that telescopes located all around the globe will be brought together to work in real-time as a single gigantic instrument."

Using an astronomical technique called electronic, real-time Very Long Baseline Interferometry, or e-VLBI, participating telescopes will observe the same object simultaneously. Data from each telescope will be streamed across the globe through high-speed optical networks to a purpose-built supercomputer at JIVE in the Netherlands. This machine acts as the focus of the giant distributed telescope, the largest real-time telescope ever, combining the signals collected from instruments across the world.

"By combining information from such widely separated radio telescopes we can produce incredibly sharp images with up to one hundred times better resolution than those available from the best optical telescopes", said Simon Garrington, Director of the UK's MERLIN/VLBI National Facility. "It's like being able to sit here in Manchester and read a newspaper in London".

With e-VLBI the ability to send data electronically and combine it in real-time has the additional advantage of providing results to astronomers within hours of conducting an observation, rather than weeks later via the traditional VLBI method of recording data onto disks and shipping it to the correlator.

JIVE Director Huib Jan van Langevelde explained, "With VLBI we can zoom in on the most energetic events in the universe, and the new e-VLBI technique allows us to do this fast enough to catch such events on the time-scale that they occur and respond quickly."

Representatives from participating institutes will attend the IYA 2009

Opening Ceremony in Paris to demonstrate the observation to over 800 attendees, including Nobel Prize winners and aspiring young scientists from over 100 countries. Organizers of the observation have also launched an educational website about e-VLBI at www.express-eu.org/iya2009 .

Provided by University of Manchester

Citation: Radio-astronomers form telescope the size of Earth (2009, January 13) retrieved 10 May 2024 from <https://phys.org/news/2009-01-radio-astronomers-telescope-size-earth.html>

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