The Australia Telescope Compact Array

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Extended Abstract

The Australia Telescope Compact Array (ATCA) is a radio telescope operated by CSIRO near Narrabri, NSW, Australia. Each of the six identical 22-m antennas is equipped with sensitive receivers in the range 1–100 GHz. Five of the antennas can be moved along a 3-km east-west railway track with a 0.2-km north-south spur. The sixth antenna is located 3 km west of the railway track, providing a maximum 6 km baseline. The ATCA is part of the Australia Telescope National Facility (ATNF), that also includes the Parkes Telescope, Mopra Telescope, and for which the Australian Square Kilometre Array Pathfinder (ASKAP) is currently being commissioned. The ATCA, Parkes Telescope, and Mopra Telescope together have been known as the Australia Telescope.

The Australia Telescope Project, to construct telescopes for a new national facility, was first proposed in 1981. In 1982, the Australian Government allocated funding for the facility and design began soon after. The Australia Telescope was opened in 1988 and scientific observations begin in 1990. At this time, the Australia Telescope National Facility was formed by combining the Parkes Telescope, completed in 1961, with the ATCA and the Mopra Telescope. All the telescopes in the ATNF became available on merit to astronomers worldwide.

The ATCA is unique in the Southern hemisphere and over its 27-year scientific life has been one of the most productive telescopes in the world. The spectacular HI images of the large and small Magellanic clouds are still the most detailed observations of HI in any external galaxy. Another extremely high impact project was the ATCA observations of the Gamma Ray Burst source 1988bw, which was reported in Nature and established the link between GRBs and supernovae. In the last five-year period, about 350 refereed papers have made use of ATCA data. This impact can be attributed to the design, which included a range of innovative technologies, ongoing instrumental upgrades with new frequencies, lower noise receivers and wider bandwidth, and the policy of access based on merit. Throughout its life, the ATCA has been funded principally by the Australian Government and operated by CSIRO as an open access National Facility.