Extended Abstract

The Parkes radio telescope, known affectionately as ‘The Dish’, is located in central-west New South Wales in Australia, ~380 km west of Sydney, and has been in operation since 1961. It is a 64-metre parabolic antenna, with receiver systems capable of observing from 700-MHz to 26 GHz with bandwidths up to a GHz, and it is part of the Australia Telescope National Facility (ATNF). The Dish has continued to be at the forefront of radio astronomy and technology research, having had many improvements, including a progressively upgraded dish surface to enable higher frequencies, a new focus cabin to extend the receiver capability, and a number of scientifically productive receivers. This receiver suite has included the 13-beam 20cm multibeam receiver [1] which enabled unprecedented surveys of atomic hydrogen in the Southern sky, and helped discovered approximately half the known population of pulsars. In more recent years Parkes discovered the first Fast Radio Burst [2], and the majority since, and it surveyed the entire Southern Galactic plane for methanol masers, detecting over 1000 with a purpose built 7-beam receiver [3].

In April 2016 the Parkes Radio Telescope was recognised as a Square Kilometre Array (SKA) Pathfinder, on the basis of Phased Array and Wideband Feed technology development. I will present a summary of the current status of the capabilities of the Parkes Radio Telescope, recent activities including the commissioning of a Phased Array Feed built for the Max Planck Institute for Radio Astronomy [4], and outline the planned developments for the coming years. This includes exploring the technologies appropriate for the SKA: an Ultra-Wideband single pixel feed operating from 700 MHz to 4 GHz, and a cryogenically cooled Phased Array Feed operating in the region of 700 MHz to 2 GHz. I will also summarise the current backend (digitizing, sampling and processing) options, together with those planned for the coming years – including a graphical processing unit based single cluster system. I will also comment on Parkes based education and outreach programmes.

References


