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Evolving operations and developing next generation technology with a radio telescope in its 60th year of operation

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In its 60th year of operation in 2021, the Parkes radio telescope, named Murriyang in Wiradjuri (the language of the Traditional Owners of the land on which it is located), is ∼20 km from the town of Parkes, New South Wales, Australia. Added to the Australian National Heritage List in 2020, it is a fully steerable 64-metre parabolic antenna, dedicated to radio astronomy with receiver systems capable of observing from 700-MHz to 26 GHz with bandwidths up to ∼3GHz.

The technological capabilities have recently developed to include: an ultra-wideband low frequency single-pixel receiver (700MHz–4GHz, replacing 4 previous narrow bandwidth receivers), serving over 95% of science proposals, and producing impactful science (e.g. [1, 2, 3]); a funding proposal being made for a higher frequency ultra-wideband single-pixel receiver counterpart (4GHz to ∼26–32GHz, replacing 5 previous receivers); and a cryogenically cooled Phased Array Feed, funded and under construction for deployment in 2022 (to replace a scientifically prolific 13-beam receiver [4]).

The Dish (as its also affectionately known) is part of the CSIRO Australia Telescope National Facility (ATNF) and has been recognised as a Square Kilometre Array (SKA) Pathfinder since 2016 (on the basis of the technology developments mentioned above, specifically Wideband Feed and Phased Array technology). The last 5 years has also seen the Dish operate as part of the Breakthrough Listen project, which marked the initiation of operating with paid telescope time. This now also includes time for dedicated follow-up of detections with the Five-hundred metre Spherical Telescope, FAST, and the potential for spacecraft tracking (as was done with Voyager 2 as it left the solar system).

I will present a summary of the current status of the capabilities of the Parkes Radio Telescope and how we are continuing to yield scientific impact through increasing efficiency with new SKA oriented technology. I will also present our operational model (which balances the purchased telescope time with competitive open access science), and our Diversity and Inclusion initiatives.

References

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