

## Active Radio Frequency Interference cancellation with advanced signal processing

Human generated Radio Frequency Interference (RFI) from terrestrial and orbiting transmitters is an ever-increasing challenge for radio astronomy. Strong RFI signals can completely swamp the faint signals from astronomical radio sources, rendering data partially or completely corrupt.

There are many approaches to dealing with RFI in radio astronomy data, but most of them involve identifying and discarding affected data. Ideally, we would like to use sophisticated signal processing techniques to reduce or remove the RFI entirely, thus restoring parts of the radio spectrum that are otherwise corrupted due to RFI.

A promising method of dealing with RFI is to use additional reference antennas to create a high-quality copy of the interfering signal, which can be cross-correlated with the radio astronomy data. In principle, this can completely remove the interference.

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**Research Field**

Radio Astronomy/Engineering

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**Project Suitability**

PhD, Masters

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Honours (as appropriate)

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**Project Supervisor**

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**Co-Supervisors**

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### Aims of project

- (i) Build on existing work using a reference antenna at the MWA site
- (ii) Incorporate real-time data stream from the reference antennas into the MWA and/or SKA-Low prototype systems.
- (iii) Quantify the level of interference cancellation achievable in the context of MWA and SKA key science programs.

This project will make use of the Curtin-operated telescopes MWA and potentially the SKA-Low prototype arrays.

The ideal student will have a strong interest in radio astronomy, computing and signal processing.



*Figure 1: The SKA-Low prototype Engineering Development Array*