

## **An Australian Low Frequency Array Architecture**

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### **Abstract**

The Low Frequency Array (LOFAR) will be a next generation astronomical interferometric multi-beaming radio telescope operating from the HF band up to 240MHz offering near square kilometre collecting aperture.

The baseline design is currently for an array of 238,500 broadband crossed dipole antenna elements distributed over an area of diameter 400km with approximately 25% of the antennas in a dense packed central 2km diameter core. There is consideration that a LOFAR located in the remote and radio quiet Mileura region of Western Australia could be implemented with the direct conversion of broadband radio to the digital domain. Commercial-off-the-shelf 8 bit analog to digital converters possibly offer adequate dynamic range performance at the required sampling rates.

A combination of short-haul 1Gbps LAN and longer-haul 10Gbps WAN fibre-optic digital signal transmission building blocks are envisioned to transport the data from antennas to beam-formers and the central processing system over dedicated fibre optic cable. An attractive option is to locate the central processing centre in the township of Geraldton and transport the Tbps of data 350km from the core of the array on a single-mode optical fibre Dense Wavelength Division Multiplexing (DWDM) system.

This poster presentation is a schematic overview of a possible Australia specific variant of LOFAR architecture summarizing aspects of signal processing and data transmission.