

Lunar-Orbiting Radio Array Simulations

The future of radio astronomy is on the Moon! For a long time, radio astronomers have dreamed of placing a low-frequency radio telescope on the far side of the Moon, where it would be completely shielded from earth-bound interference, and unaffected by the ionosphere. As a step toward this ambitious goal, several projects are now planning to send radio arrays into lunar orbit, where they would observe while on the far side and transmit data back to Earth while on the near side of their orbits. This potentially opens an entirely new parameter space of ultra-long wavelength, high angular resolution radio imaging that is impossible from the surface of the Earth.

To make such a mission a reality, detailed simulations of the orbiting array and new imaging and calibration strategies will be required. Researchers at the Curtin Institute of Radio Astronomy are collaborating with Chinese colleagues to produce such simulations and build software that can be used to produce images from lunar-array data. We are looking for students to join the project in order to:

- (i) realistically simulate the science-data output of the satellites
- (ii) develop and test new calibration strategies for the array
- (iii) develop and test imaging algorithms that can be applied to this data set

This is a unique opportunity to become involved with a space mission and to collaborate with Chinese researchers on an ambitious project to observe the Universe like never before!

Research Field

Radio Astronomy/Engineering

Project Suitability

PhD

Honours

Project Supervisor

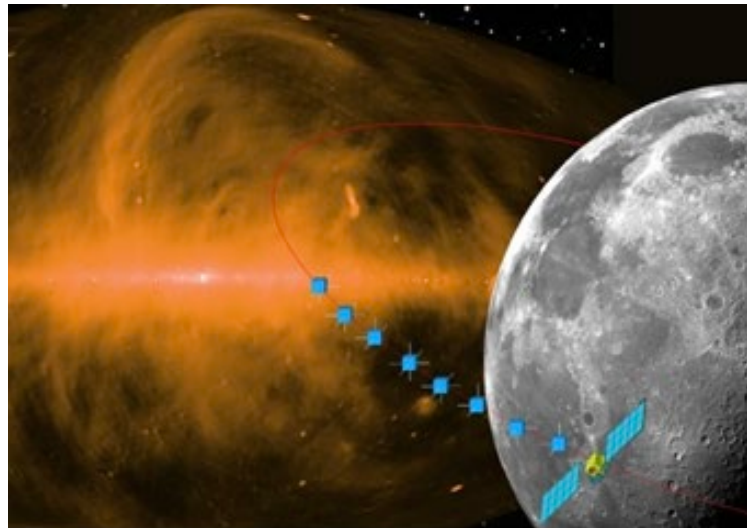
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An artist's impression of a lunar-orbiting array against the background image of our Galaxy at low frequencies