

## ICRAR & ICRAR-Pawsey Summer Studentships 2016 - 2017 Project Proposal

Project Details	
Project Title	Reliability Availability and Maintainability Assessment Study of the Power Distribution System for Aperture Array Radio Telescope
Primary Supervisor	Budi Juswardy
Contact Details	Budi.juswardy@curtin.edu.au
Additional Supervisors & Contact Details	<p><i>SKA_LOW is an international radio astronomy project that will be built in Murchison region, Western Australia. The front-end part of SKA_LOW receiver consists of several hundred thousand low-frequency antenna elements placed in sparse aperture arrays configuration in a core area of around 5 km in diameter, and extended into smaller stations stretched up to 50 km away from the core.</i></p> <p><i>Individual antenna element requires low-voltage low-power electrical supply to power electronics circuitry placed on each element. Therefore, the capability of the radio receiver for SKA project will be highly dependent by the availability and reliable distribution of power supplies, operating at the remote and hostile Australian outback environment.</i></p> <p><i>In this project, the student will look into a particular power distribution topology (or topologies), and evaluate the reliability of the power distribution system for Low Frequency Aperture Array (LFAA) front-end, a proposed system for SKA_LOW, as a case study.</i></p> <p><i>Of a particular interest would be predicting the availability of the telescope, when we strictly limit the assessment into the availability of power supply. The extent of outages due to power system defects (MTTF of the power system components), catastrophic events (such as lightning strikes, extreme weather conditions, cyclone and flooding) and scheduled maintenance will be assessed and used to predict the Reliability Availability and Maintainability (RAM) of the SKA_LOW telescope, and compared with the availability requirements for LFAA, as well as suggesting power system maintenance plan for the telescope.</i></p> <p><i>This project will suit a student interested in investigating power distribution reliability assessment for a large project such as the SKA project.</i></p>
Additional Resources Required	Computer Access, MWA maintenance/ failure data

Student Location for project	Curtin
Project Description	
<b>Student Attributes</b>	
Academic Background	3rd year undergraduate (or equivalent) student in Electrical Engineering or Physics (or similar)
Computing Skills	High-level programming (MATLAB, Python or equivalent)
Training Requirement	
<b>Project Timeline</b>	
Week 1	Literature reading
Week 2	Literature reading
Week 3	Review of the literatures
Week 4	Scoping of the project
Week 5	Data collection
Week 6	Data collection and analysis
Week 7	Data analysis, summarising the finding
Week 8	Draft report complete
Week 9	Review and revise report
Week 10	Deliver report and prepare for presentation
	<b>Final Presentation</b>