ICRAR & ICRAR-Pawsey Summer Studentships 2018-2019
Project Proposal

Project Details

Project Title	**Synchronisation of the Square Kilometre Array**
Primary Supervisor	**Sascha Schediwy**
Primary Supervisor Availability	**Standard period, with likely an extra week off over break**
Contact Details	sascha.schediwy@uwa.edu.au, 08 6488 3430
Additional Supervisors & Contact Details	Charles Gravestock, 21202653@student.uwa.edu.au
Additional Resources Required	Laboratory access
Pawsey Centre Hardware Use	None
Software Required	Some free apps on Windows OS
Student Location for project	ICRAR-UWA
Project Description	The aim of this project is to contribute to the development of the frequency synchronisation system for the Square Kilometre Array (SKA) radio telescope. The SKA will be the largest and most complex astronomical instrument to date, with individual antennas spread over continental scales. One of the most complex technical challenges will be the coherent combination of astronomical signals collected by the hundreds of remote antennas. To achieve this, astronomical observations must be synchronised using timing signals of exquisite accuracy and precision. The student will work as part of the Astrophotonics Group at the International Centre for Radio Astronomy Research (ICRAR) to help design, build, and test an optical fibre-based frequency distribution system tailored to meet the scientific needs and logistical challenges of the SKA. This system will be developed in our UWA laboratory and tested on Perth's AARNet fibre networks, with the aim to deploy the finished product on the MeerKAT telescope in South Africa. This research will be conducted in collaboration with the University of Manchester's Jodrell Bank Observatory and SKA South Africa. For more information, see: www.icrar.org/astrophotonics/.

Student Attributes

Academic Background	Experimental physics or engineering background
Computing Skills	Less important
Training Requirement	Laboratory safety and laser training

Project Timeline	
Week 1	Laser safety induction, review of techniques
Week 2	review of techniques, familiarisation of laboratory
Week 3	development of techniques, laboratory development
Week 4	development of techniques, laboratory development
Week 5	laboratory development, performance calculations
Week 6	laboratory development, performance calculations
Week 7	deployment on AARNet fibre network
Week 8	data analysis, preparation of report and presentation
Week 9	preparation of report and presentation
Week 10	**Final Presentation and Reporting**