ICRAR & ICRAR-Pawsey Summer Studentships 2017-2018
Project Proposal

Project Details	
Project Title	**Searching for MWA detections of optically flaring stars**
Primary Supervisor	Gemma Anderson
Primary Supervisor Availability	Gemma: Nov 27 – Dec 21, Jan 22 – Feb 16 Paul: Nov 27 – Dec 08, Jan 8 – Feb 16
Contact Details	9266 3785 / Gemma.Anderson@curtin.edu.au
Additional Supervisors & Contact Details	Paul Hancock 9266 9102 / Paul.Hancock@curtin.edu.au
Additional Resources Required	Desktop computer + desk
Pawsey Centre Hardware Use	Galaxy, group: mwasci
Software Required	Student Desktop Requirements: • Normal CIRA software stack Pawsey Centre software installations required: • Normal mwasci software stack
Student Location for project	ICRAR-Curtin
Project Description	Some of the smallest stars in our Galaxy, with masses as low as one tenth of our Sun, can produce flares that are ten thousand times more powerful than Solar flares. These flares impact the atmospheres, habitability, and even the formation of their surrounding planets. In the 1970's it was demonstrated that optical flares could be accompanied by bright, very low frequency radio flares. However, modern low frequency radio telescopes, such as the Murchison Widefield Array (MWA), have only detected faint radio flares and it is uncertain if they are truly associated with optical flares. The MWA is a low frequency radio telescope operating in Western Australia that has an extremely large field of view (~1000 deg^2). This ensures thousands of radio sources are observed within a single pointing, including nearby magnetically active flare stars. In this project you will develop an automatic tool for selecting MWA observations that were serendipitously observing magnetically active stars while they were undergoing bright optical flaring events. You will identify these optical flares in light curves generated from surveys conducted by SkyMapper and the All Sky Automated Survey for Supernovae. You will then use pipelined processing tools to search for associated low frequency radio flares in these MWA observations.

Student Attributes	
Academic Background	Physics + Astronomy
Computing Skills	Linux, Python, BASH
Training Requirement	HPC methods (optional)
Project Timeline	
Week 1	**Induction and training**
Week 2	Literature reading: motivation, context
Week 3	Data acquisition and exploration
Week 4	Algorithm development (code)
Week 5	Algorithm testing and refinements
Week 6	Identification of flare star observations
Week 7	Creation of radio images
Week 8	Image data analysis
Week 9	Further data analysis
Week 10	**Final Presentation and Reporting**