

# ICRAR & ICRAR-Pawsey Summer Studentships 2018-2019

## Project Proposal

Project Details	
Project Title	The Origin of Fast Radio Bursts
Primary Supervisor	Dr. Jean-Pierre Macquart
Primary Supervisor Availability	Available for the entire duration: Nov 2017-Feb 2018, except the Christmas break.
Contact Details	<a href="mailto:J.Macquart@curtin.edu.au">J.Macquart@curtin.edu.au</a> 08 9266 9248
Additional Supervisors & Contact Details	Dr Clancy James, Dr Ramesh Bhat
Additional Resources Required	None
Pawsey Centre Hardware Use	Yes
Software Required	<p>List all software requirements here.</p> <p>Student Desktop Requirements:</p> <ul style="list-style-type: none"> <li>• None</li> </ul> <p>Pawsey Centre software installations required:</p> <ul style="list-style-type: none"> <li>• DSPSR, CRAFT custom software (already installed)</li> </ul>
Student Location for project	ICRAR-Curtin
Project Description	<p>Fast Radio Bursts (FRBs) are a newly discovered population of millisecond-timescale transient events. Their origin is unknown, but they are thought to emanate at cosmological distances, making the observed emission from these events extremely luminous. In this project you will use data from the CRAFT survey on the Australian SKA Pathfinder (ASKAP) to analyse data from detected Fast Radio Bursts, and reconstruct their arrival directions</p> <p>The project will involve using the Pawsey supercomputer to analyse data from the Commensal Real-time ASKAP Fast Transients (CRAFT) survey for FRBs. You will visually inspect and de-disperse the data, and correlate data from different antennas. This will produce the FRB arrival directions, which hold the key to identifying the host galaxy, and understanding what is producing these rare events.</p>
Student Attributes	
Academic Background	The student should have (at least) a basic knowledge of computing and a basic familiarity with electrodynamics. A basic knowledge of astronomy is desirable but not essential.
Computing Skills	None – the project requires familiarity with unix operating environments
Training Requirement	None
Project Timeline	
Week 1	Pawsey training (or inductions and project introduction)
Week 2	Introduction to FRBs
Week 3	Running DSPSR and viewing tools

Week 4	Implementing dedispersion algorithm on voltage data
Week 5	Check on known pulsars
Week 6	Implementing cross-correlation (position reconstruction)
Week 7	Check on known pulsars
Week 8	Collation of results for detected FRBs
Week 9	Reporting of results and presentation preparation
Week 10	<b>Final Presentation and Reporting</b>