Kickstart you career with CSIRO's Industry PhD

Earn your PhD in partnership with industry, a leading university, and Australia's national science agency, CSIRO.

The CSIRO Industry PhD Program (iPhD) is a research training program, focusing on applied research that benefits industry by solving real-world challenges. It aims to produce the next generation of innovation leaders with the skills to work at the interface of research and industry in Australia.

The opportunity

- Admission to a university PhD program
- A four-year scholarship valued at $46,000 per annum (2024 rate)
- A project expense and development package of up to $13,000 per annum
- Supervision by CSIRO, an industry partner and the host university
- A 60-day Industry Engagement component with the industry partner
- A structured professional development and training package

Successful students will receive a PhD on completion.

Eligibility requirements

The student must:

- Be an Australian citizen or Permanent Resident, or a New Zealand citizen.
- Meet participating university PhD admission requirements.
- Meet university English language requirements.
- Not have previously completed a PhD.
- Be able to commence the Program in the year of the offer.
- Enrol as a full-time PhD student.
- Be prepared to be located at the project location(s) that the host university has approved and, if required, comply with the host university's external enrolment procedures.

Application process

- Applicants submit an expression of interest (EOI) by emailing the university supervisor, or by following the instructions on the university's webpage, when available. Applications are open until position is filled.
- The EOI is assessed by the supervisory team and shortlisted applicants are interviewed.
- The supervisory team nominates a preferred applicant.
- The application is assessed by the university against PhD admission criteria.
- The university will issue a letter of offer for the program if all conditions have been satisfied.

FOR FURTHER INFORMATION

- Visit the iPhD website
- Contact the project's supervisory team
- Contact the iPhD team

Project overview

Novel GPU-based digital signal processing for rapid prototyping with phased array feeds

This project focuses on developing a GPU-based processing pipeline for multi-element phased array feeds that are used for radio astronomy. Its primary objective is to generate hundreds of independent beams that cover a wide field of view while enabling advanced signal analysis that surpasses the capabilities of current DSP approaches.

In this way, crucial tasks such as detecting and removing radio frequency interference and identifying astronomical signals (e.g., pulsars and fast radio bursts) can be performed over wide bandwidths and in real time. By employing GPUs and a software-based approach, the Project will enable rapid prototyping of new techniques and algorithms that can be incorporated directly into the high-performance pipeline.

Overall, the project aims to revolutionise phased array feed analysis through GPU acceleration and novel signal processing algorithms. Phased array feeds are growing rapidly in importance in both astronomy and space sciences, meaning that the potential impact of these advances is large. By utilising the strengths of GPUs and enabling rapid prototyping, the project seeks to uncover new insights and push the boundaries of data processing. With its potential to deliver faster and more adaptable solutions, this Project has the capacity to drive ground-breaking advancements in the field of phased array feed data processing.

SUPERVISORY TEAM DETAILS	
Swinburne University of Technology	Adam Deller adeller@swin.edu.au
CSIRO	Chris Phillips Chris.Phillips@csiro.au
Fourier Space Pty Ltd	Andrew Jameson andrew.jameson@fourierspace.com.au Fourier Space – Transformational Signal Processing for Space & Astronomy

Ideal student skillset

Essential:

- A degree in (astro)physics, maths, or engineering, accompanied by a robust coding proficiency, particularly in languages such as C or C++

Desirable:

- Experience in digital signal processing and/or astronomy is advantageous
- Familiarity with GPU coding is not a prerequisite; however, the student should possess the confidence and aptitude to acquire these skills rapidly, with appropriate guidance and supervision

PROJECT LOCATIONS	
Primary location	Swinburne University of Technology, VIC 3122
Industry Engagement component location	Fourier Space Pty Ltd, VIC 3122
Other potential locations	CSIRO Marsfield, NSW 2122