# Position Details

## Research Projects- CSOF5

|  |  |
| --- | --- |
| The following information is for applicants | |
| Advertised Job Title | GPU Software Engineer – Astronomy |
| Job Reference | 72393 |
| Tenure | Specified term of 3 years  Full-time (job-share may be an option if circumstances permit) |
| Salary Range | AU$98k to AU$106k per annum, plus up to 15.4% superannuation |
| Location(s) | Marsfield (Sydney) New South Wales |
| Relocation Assistance | Will be provided to the successful candidate (within Australia) if required |
| Applications are open to | Australian Citizens and Permanent Residents and New Zealand Citizens who usually reside in Australia |
| Position reports to the | Group Leader, Signal Processing Technologies |
| Client Focus – Internal | 100% |
| Client Focus – External | 0% |
| Number of Direct Reports | 0 |
| Enquire about this job | Contact Aaron Chippendale via email [Aaron.Chippendale@csiro.au](mailto:Aaron.Chippendale@csiro.au)  or telephone +61 2 9372 4296 |
| How to apply | Apply online at <https://jobs.csiro.au/>  Internal applicants please apply via **Jobs Central**  If you experience difficulties when applying, please email [careers.online@csiro.au](mailto:careers.online@csiro.au) or call 1300 984 220. |

**Role Overview**

The GPU Software Engineer is responsible for the development, testing and continuous improvement of CUDA C/C++ software for GPU processing of streaming digital signals from radio telescopes. The position contributes to the design, implementation and support of digital systems that further Australia’s world-class capability in radio astronomy and space science. The role involves building and maintaining networks, influencing research directions, providing engineering leadership, and pursuing new ideas and technologies for CSIRO.

The Technologies for Radio Astronomy program at CASS is focussed on maintaining Australia’s globally recognised leadership in radio astronomy technology and infrastructure. We operate several world-class radio astronomy observatories that are collectively known as the Australia Telescope National Facility or ATNF. We design and deliver advanced instrumentation and data-processing systems for our own telescopes, for international facilities, and even for space flight. Beyond astronomy our work is finding application in earth observation, satellite communications, and space situational awareness.

This position contributes to large instrumentation projects that require CUDA C/C++ programming expertise to implement high-throughput digital signal processing, imaging, and machine learning pipelines for scientific discovery. Experience with other CPU/GPU/FPGA programming environments such as OpenACC, OpenCL or High Level Synthesis (HLS) would be beneficial in the role.

### Duties and Key Result Areas:

* Develop, test, and continuously improve CUDA C/C++ software for GPU processing of streaming digital signals from radio telescopes for radio astronomy.
* Explore new programming languages and techniques to achieve higher compute, higher data throughput, and faster development time for CPU/GPU/FPGA processing of telescope data.
* Deliver clean, scalable, reliable, and high-quality test-driven code.
* Work with elevated independence to design, develop and adapt digital systems and software, requiring strong initiative, ingenuity, and skills (sometimes beyond a single discipline).
* Liaise with stakeholders to determine their needs, tailoring solutions to potentially conflicting requirements, taking personal responsibility for stakeholder satisfaction, and correcting problems promptly and in a constructive manner.
* Participate in project scoping and planning, making significant contributions to the research or technological direction, and advising the level and type of services that are provided.
* Advise and support efforts to develop astronomy techniques and systems for commercial application, including appropriate handling of sensitive information and intellectual property of CSIRO and/or commercial partners.
* Have a significant role in communicating research or technological results in internal and external forums and, where applicable, contribute to and/or generate scientific papers.
* Lead teams and/or collaborate with staff from other teams in meeting their objectives.
* Produce novel techniques and enhanced results, providing researchers with new or improved approaches to research problems or technical problems.
* Communicate openly, effectively, and respectfully with all staff, clients and suppliers in the interests of good business practice, collaboration and enhancement of CSIRO’s reputation.
* Work collaboratively as part of a multi-disciplinary research team to carry out tasks in support of CSIRO’s scientific objectives.
* Adhere to the spirit and practice of CSIRO’s Code of Conduct, Health, Safety and Environment plans and policies, Diversity initiatives and Zero Harm goals.
* Other duties as directed.

## **Selection Criteria**

#### Essential

*Under CSIRO policy only those who meet all essential criteria can be appointed.*

1. A relevant bachelor’s degree or equivalent relevant work experience in engineering, physical science or computer science.
2. Demonstrated expertise in CUDA C/C++ programming (with consideration for equivalents such as OpenACC, OpenCL and HLS).
3. Experience developing software under version control in a collaborative environment, and a strong aptitude for testing, system integration and verification.
4. The ability to work effectively as part of a multi-skilled and multidisciplinary team.
5. The ability to organise, set priorities, and work independently and effectively on complex problems that are sometimes ill-defined.

## **Desirable:**

1. Experience in astronomy, astronomical instrumentation, or digital radio.
2. Experience with high-speed networking and digital signal processing techniques and their implementation.
3. Experience in python programming.

## **Required Competencies:**

* **Teamwork and Collaboration:** Cooperates with others to achieve organisational objectives and may share team resources in order to do this. Collaborates with other teams as well as industry colleagues.
* **Influence and Communication:** Uses knowledge of other party's priorities and adapts presentations or discussions to appeal to the interests and level of the audience. Anticipates and prepares for other’s reactions.
* **Resource Management/Leadership:** Sets up and maintains effective and efficient work teams and manages performance and resources, to achieve objectives. Chooses appropriate management strategies and communication styles to maintain high levels of motivation and productivity. Gives feedback for development purposes and provides support and direction for improvement.
* **Judgement and Problem Solving:** Investigates underlying issues of complex and ill-defined problems and develops appropriate response by adapting/creating and testing alternative solutions.
* **Independence:** Plans, sets and works to meet challenging standards and goals for self and/or others. Recognises where endeavours will make the most impact or difference, decides on desired outcome and sets realistic goals to reach this target.
* **Adaptability:**Copes with ambiguity or situations that lack clarity. Adapts readily to changing circumstances and new responsibilities (which may include activities outside own preferences) in the interests of achieving team objectives. Recognises the need for and undertakes personal development as a result of changes.

Special Requirements

* The successful candidate will be asked to obtain and provide evidence of a National Police Clearance or equivalent. Please note that individuals with criminal records are not automatically deemed ineligible. Each application will be considered on its merits.

**About CSIRO:**

We solve the greatest challenges through innovative science and technology. Visit [CSIRO Online](http://www.csiro.au/) and [CSIRO Astronomy and Space Science](https://www.csiro.au/en/Research/Astronomy) for more information.

CSIRO is a values-based organisation.  In your application and at interview you will need to demonstrate behaviours aligned to our values of:

1. People First
2. Further Together
3. Making it Real
4. Trusted