# Position Details

## Research Scientist/Engineer- CSOF6

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| **The following information is for applicants** | |
| Advertised Job Title | Senior FPGA Firmware Engineer |
| Job Reference | 67433 |
| Tenure | Indefinite  Full-time |
| Salary Range | AU$113,338 to AU$132,811 pa (pro-rata for part-time) + up to 15.4% superannuation |
| Location(s) | Marsfield (Sydney), New South Wales |
| Relocation Assistance | Will be provided to the successful candidate if required |
| Applications are open to | All Candidates |
| Position reports to the | Team Leader, Digital Signal Processing |
| Client Focus – Internal | 100% |
| Client Focus – External | 0% |
| Number of Direct Reports | 0 |
| Enquire about this job | Aaron Chippendale via email to [Aaron.Chippendale@csiro.au](mailto:Aaron.Chippendale@csiro.au) or phone +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 role of Research Engineering Staff in CSIRO is to conduct innovative research and development that enables scientific achievements aligned with CSIRO’s strategies. In this position, the Engineer may be engaged in engineering activity ranging from research through to the design and development of digital systems that further Australia’s world class capability in radio astronomy and space science. The Engineer will have the opportunity to build and maintain networks, influence strategic research directions, provide engineering leadership and pursue new ideas and technologies for CSIRO Astronomy and Space Science (CASS).

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. As a member of the CASS Engineering team, the Engineer will be involved in one or more of the current large overarching project focus areas:

* Extensions and enhancements to Australian Square Kilometre Array Pathfinder (ASKAP).
* Leadership of the SKA low frequency array correlator and beamformer, a multi-national big-science project.
* Advanced phased-array feed systems for wide-field radio astronomy.
* Ultra-wide bandwidth receivers for single-dish radio telescopes.
* Sensor signal processing systems for space-based applications.

As a part of the CASS Signal Processing Technologies group’s ongoing commitment to delivering novel solutions for radio astronomy and space science projects, the Engineer will have the opportunity to contribute to more general and strategic areas of active research, including:

* Custom, power-efficient, high-performance computing.
* Scalable multi-channel processing systems.
* Wide-bandwidth samplers.
* Very-high bandwidth data communications.
* Algorithm design and implementation for digital signal processing.
* Design with strict electromagnetic compatibility and interference mitigation strategies.
* Hardware and firmware design for space applications, including radiation tolerant systems.
* Thermal design and novel device cooling solutions.

### Duties and Key Result Areas:

* Lead the architecture design and development for components of FPGA firmware for systems aimed at radio astronomy and space science applications.
* Adapt and/or develop new techniques, software and FPGA firmware to support existing and new instruments.
* Deliver clean, scalable, reliable and high-quality test-driven code.
* Communicate effectively and respectfully with all staff, clients and suppliers in the interests of good business practice, collaboration and enhancement of CSIRO’s reputation.
* Work effectively as an integral member of a large multidisciplinary team, to undertake independent engineering work and perform or delegate related tasks under broad guidance.
* Communicate research results and project development updates through oral and written reports, which may include the preparation of documents for patent applications.
* Where appropriate, provide advice to project and program leaders and members of the CASS executive to inform and transfer knowledge to non-technical audiences.
* Provide leadership and/or mentoring and supervise more junior staff to ensure that projects are delivered in accordance with agreed technical requirements, timeframes and budgets.
* Undertake feasibility studies that demonstrate a considerable degree of originality, creativity and innovation in solving problems and introducing new directions and approaches.
* Adhere to the spirit and practice of CSIRO’s Code of Conduct, Health, Safety and Environment procedures and policy, Diversity initiatives and Making Safety Personal goals.
* Other duties as directed.

## **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:** Identifies critical stakeholders and influences them via an influential third party, for example through an established network, to gain support for sometimes contentious proposals/ideas.
* **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:** Anticipates and manages problems in ambiguous situations. Develops and selects an appropriate course of action and provides for contingencies. Evaluates, interprets and integrates complex bodies of information and draws logical conclusions, synthesises proposals and defends options with reasoned arguments.
* **Independence:** Assesses the risk and opportunity of identified strategies, options and actions. Overcomes problems and setbacks in achieving goals. Invariably includes consideration of value-added future impact on bottom line when determining the optimal and efficient use of resources.
* **Adaptability:**Demonstrates flexibility in thinking and adapts to, and manages, the increasing rate of organisational change by adjusting strategies, goal and priorities.

## **Selection Criteria**

#### Essential

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

1. A tertiary degree in electronic engineering, computer engineering or a related discipline, plus significant post qualification practical experience in a relevant area.
2. Significant experience in FPGA firmware development, including familiarity with VHDL, high-speed digital design, multiple clock domains, memory interfaces (eg. DDR, HBM, QDR), hard IP (SerDes, PLLs, DSPs), and related simulation and test-bench design.
3. Demonstrated experience with firmware and embedded software engineering processes and systems, including firmware toolchains and build systems, revision control, issue tracking and knowledge and/or experience with agile development methodologies.
4. A proven ability to work effectively as part of a multi-skilled and multidisciplinary team, as well as the ability to harness strong self-motivation to carry out tasks autonomously.
5. Well-developed interpersonal skills to contribute actively and effectively to group discussions and team meetings as well as leadership strengths and the ability and initiative to take on ownership of complex tasks.

## **Desirable:**

1. Demonstrated abilities in C/C++ and Python programming languages.
2. Practical experience with high-speed networking software and firmware.
3. Experience in the development of Linux kernel-level or user-level drivers to FPGA devices.
4. Experience in algorithm design and implementation for digital signal processing.

**Special Requirements**

Appointment to this role may be subject to conditions including provision of a national police check as well as other security/medical/character clearance requirements.

* The successful candidate will be asked to obtain and provide evidence of a National Police Check or equivalent. Please note that people with criminal records are not automatically deemed ineligible. Each application will be considered on its merits.
* If the successful candidate is not an Australian Citizen or Permanent Resident, they may be required to undergo additional security checks.

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Find out more about the CSIRO [Astronomy and Space Science](https://www.csiro.au/en/Research/Astronomy)