# Position Details

## Research Scientist/Engineer- CSOF6

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| The following information is for applicants | |
| Advertised Job Title | Research Scientist in Quantum Algorithms and Applications |
| Job Reference | 89849 |
| Tenure | Indefinite  Full-time |
| Salary Range | AU$117,917 - AU$131,423 per annum, plus up to 15.4% superannuation |
| Location(s) | Clayton, Melbourne |
| Relocation Assistance | Will be provided to the successful candidate if required |
| Applications are open to | All Candidates |
| Position reports to the | Team Leader Quantum Systems |
| Client Focus – Internal | 0% |
| Client Focus – External | 0% |
| Number of Direct Reports | 0 |
| Enquire about this job | Dr Muhammad Usman via email at muhammad.usman@csiro.au |
| 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. |

**Acknowledgement of Country**

CSIRO acknowledges the Traditional Owners of the land, sea and waters, of the areas that we live and work on across Australia. We acknowledge their continuing connection to their culture and pay our respects to their Elders past and present. View our [vision towards reconciliation](https://www.csiro.au/en/about/Indigenous-engagement/Reconciliation-Action-Plan).

### Role Overview

The role of Research Scientist/Engineer staff is to conduct innovative research leading to scientific achievements that are aligned with CSIRO’s strategies. The Research Scientist/Engineer may be engaged in scientific activity ranging from fundamental research to the investigation of specific industry or community problems. The Research Scientist/Engineer will have the opportunity to build and maintain networks, play a lead role in securing project funds, provide scientific leadership and pursue new ideas and approaches that create new concepts.

In this role, Research Scientist will be appointed on a position leading to an indefinite role. The candidate will work within Data61’s Quantum Systems Team and also closely interact with the Future Science Platform Quantum Technology.

### Quantum Systems Team at Data61

Data61 at CSIRO has established a new [Quantum Systems Team](https://research.csiro.au/distributed-systems-security/about/quantum-security/) where the research is focused on reducing the barrier to the future development of quantum technologies and paving the way for wider usability of quantum technologies with security and responsible use. The reduction of the barrier will be underpinned by the development of innovative quantum software engineering methods, tools and platforms, which will provide a hardware-agnostic high-level software engineering environment for quantum application developers, alleviating the need for rigorous training in complex quantum physics. The software platform will provide opportunities to seamlessly work in diverse and heterogeneous environments, exploiting both quantum hardware resources and hybrid quantum/classical environments where quantum systems work in conjunction with the existing classical supercomputing systems. The usability of quantum technologies will be expedited by developing novel applied and scalable quantum algorithms tailored for real-world problems arising from [Australia’s greatest challenges](https://www.csiro.au/en/about/challenges-missions) and through engagement with CSIRO’s missions, cross-disciplinary CSIRO business units, SMEs, industry, Defence and government sectors. The security, safety and privacy of quantum technologies will first be ensured by implementing hybrid classical/quantum security protocols to help in a smooth transition to a post-quantum world. Our research will also create a broader framework for responsible and purpose-driven design and adoption of quantum computing technologies to drive positive outcomes for society.

### Future Science Platform Quantum Technologies

[Future Science Platforms](http://www.csiro.au/en/About/Future-Science-Platforms) (FSPs) are an investment in science that underpins innovation and has the potential to help reinvent and create new industries for Australia.  They are strategic investments for CSIRO, aimed at developing capacity in areas of identified future importance for Australia. FSPs are both impact and science-focused, developing innovative scientific solutions with industry, government and university partners with a 5-to-10-year vision.

The [Quantum Technologies (QT) FSP](https://research.csiro.au/qt/) aims to establish and grow capacity in quantum technology research and development at CSIRO, and is part of a larger strategic investment in [Quantum at CSIRO](http://www.csiro.au/quantum). The QT-FSP launched in November 2021 and will become a portfolio of projects that build on CSIRO’s long-standing and deep domain expertise.

The opportunity we are seizing leverages existing expertise while extending into new, uncharted areas of discovery in quantum science and technology. The Research Scientist Role is critical to each project team, bringing their quantum skills to bear on specific application domains. As such, the Research Scientist will be working in a highly cross-disciplinary environment and be challenged to help create new quantum capability inside CSIRO.

Ideally, the Research Scientist will have an interest in industrial applications of quantum technologies, in solving problems that may have real commercial value, and in making an impact to better the lives of Australians. These areas of focus represent the biggest challenge facing the evolution of “quantum technologies” into a bona fide industry: identifying applications where quantum advantage can be achieved.

### Duties and Key Result Areas

Under the direction of Team Leader, Senior Research Scientists and Engineers, this Research Scientist will:

* + Carry out innovative, impactful research on the development of quantum algorithms and simulations that will, where possible, lead to novel and important scientific outcomes.
  + Recognise and exploit opportunities of quantum algorithms, security and applications, and progress opportunities for the further development or creation of new lines of research.
  + Build strategic relationships within the QT FSP, as well as industry and academic partners.
  + Work collaboratively with colleagues within the team, QT FSP, and across CSIRO.
  + Produce high quality scientific and/or engineering papers suitable for publication in quality journals, for client reports and granting of patents.
  + Conduct technical presentation at conferences or relevant events.
  + Develop research protypes and demonstrate at conferences or relevant events.
  + Utilise design thinking methodology to plan and prepare research proposals, and apply non-academic impact methodology to research projects
  + Carry out research investigations requiring originality, creativity and innovation
  + Record, manage, and analyse data/information using relevant domain data science techniques.
  + Proactively undertake development to grow effective researcher capabilities to support career goals.
  + 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.
  + Undertake an appropriate training and development program developed by CSIRO.
* Other duties as directed.

## **Selection Criteria**

#### Essential

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

1. A PhD (or an equivalent combination of qualifications and research experience) in a relevant field such as Physics, Computer Science, and Quantum Computing.
2. Demonstrated ability to undertake original, creative and innovative research by generating and pursuing novel ideas and solutions to scientific research problems.
3. A demonstrated publication history of authorship on scientific papers in peer reviewed journals and/or reports, grant applications or inventorship on patent applications.
4. High level written and oral communication skills with the ability to represent the research team effectively internally and externally, including the presentation of research outcomes at national and international conferences.
5. A record of science innovation and creativity, including the ability & willingness to incorporate novel ideas and approaches into scientific investigations.

## **Desirable**

1. Basic knowledge of quantum computing and quantum algorithms
2. Basic knowledge of software engineering and compiler design
3. Basic knowledge of data security
4. Experience of implementing research protype relevant to quantum computing, software engineering, and/or quantum algorithms
5. Remain productive, positive and resilient in complex, ambiguous and/or uncertain environments
6. **The ability to work effectively as part of a multi-disciplinary, potentially regionally dispersed research team, plus the motivation and discipline to carry out autonomous research.**

## **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.

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 Clearance or equivalent. Please note that individuals 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 clearances, which may include medical examinations and an international standardised test of English language proficiency (i.e. IELTS test).- https://ielts.com.au/

## **About CSIRO**

We solve the greatest challenges through innovative science and technology. Visit [CSIRO Online](http://www.csiro.au/) and [Data61 Quantum Systems](https://research.csiro.au/distributed-systems-security/about/quantum-security/) 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:

* People First
* Further Together
* Making it Real
* Trusted