# Position Details

## CSIRO Early Research Career (CERC) Postdoctoral Fellowship– CSOF4

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| The following information is for applicants | |
| Advertised Job Title | CSIRO Postdoctoral Fellowship in Applied Quantum Computing for Materials and Process Modelling |
| Job Reference | 92252 |
| Tenure | Specified Term of 3 years  Full-time |
| Salary Range | AU$89,680 to AU$101,459 p.a. + up to 15.4% superannuation |
| Location(s) | Clayton, Victoria |
| Relocation Assistance | Will be provided to the successful candidate if required |
| Applications are open to | All candidates |
| Position reports to the | Dr Tony Murphy, Team leader |
| Client Focus – Internal | 90% |
| Client Focus – External | 10% |
| Number of Direct Reports | 0 |
| Enquire about this job | Contact Sam Yang via email at [sam.yang@csiro.au](mailto:sam.yang@csiro.au) or phone +61 3 9545 2759 |
| 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

**CSIRO Early Research Career (CERC) Fellowships** provide opportunities to scientists and engineers who have completed their doctorate and have less than three years relevant research experience. These Fellowships aim to develop the next generation of future leaders of the innovation system through:

* A differentiated career development program to deliver capability excellence and breadth across all facets of the national innovation system;
* Research training via strategic research and development projects with a clear focus that will deliver real impact through science and engineering excellence;
* An innovative culture supporting the development and demonstration of original thinking and expertise leading to peer-recognition; and
* Opportunities to develop skills and experience in collaborative research teams to effectively work within national and global multi/transdisciplinary and multi-stakeholder environments.

CERC Fellows **are appointed for three years or part time equivalent.**

The Fellow will undertake research on advancing quantum annealing and other quantum computing techniques and algorithms for applications in materials and process related modelling and optimisation. Quantum annealing is a type of quantum computing that is already finding practical application. The Fellow’s research will focus on topics including improving quantum computational efficiency, solving large problems, and applying quantum computing to high-impact applications.

The Postdoctoral Fellow will be working with a multidisciplinary team of experts in quantum computing, computational modelling and materials science and engineering, based at CSIRO Manufacturing. The Fellow will collaborate with researchers associated with CSIRO’s Quantum Technologies Future Science Platform and our university and industrial partners.

The Postdoctoral Fellow will be based at CSIRO site in Clayton, Victoria and able to access a wide range of facilities. The Fellow will be offered great opportunities to collaborate and develop new skills and innovative ideas.

### Duties and Key Result Areas

Under the direction of senior research scientists and engineers, this CERC Fellow will:

* + Develop and evaluate novel approaches that improve the efficiency of quantum annealing and potentially gate-model quantum computing in solving large optimisation problems.
  + Identify and develop new applications of quantum annealing and potentially gate-model quantum computing, for example, in materials modelling or image analysis.
  + Carry out innovative, impactful research of strategic importance to CSIRO that will, where possible, lead to novel and important scientific outcomes.
  + Recognise and exploit opportunities for innovation and the generation of new theoretical perspectives, and progress opportunities for the further development or creation of new lines of research.
  + 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 Zero Harm goals.
* Other duties as directed.

The CERC Fellow learning, development and training programis developed between the CERC Fellow and their CSIRO supervisor. The program will focus on enhancing the Fellow’s capabilities to the level expected of an independent researcher and will include on-the-job and course-based development encompassing:

* Discipline-specific techniques and protocols
* Professional growth
* Project management
* Communication and influencing skills
* Working and collaborating with others

## **Selection Criteria**

#### Essential

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

1. A doctorate (or will shortly satisfy the requirements of a PhD). The doctorate must be in a relevant discipline area, such as physics, applied mathematics, computer science, operations research, materials science, or equivalent.

Please note: To be eligible for this role you must have **no more than 3 years** (full time equivalent) of relevant research experience.

1. Demonstrated ability to apply mathematical and/or computational approaches to solve complex physical or materials science problems.
2. Demonstrated ability to apply numerical techniques to solve complex R&D problems.
3. 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.
4. A sound history of publication in peer reviewed journals and/or authorship of scientific papers, reports, grant applications or patents.
5. A record of science innovation and creativity, including the ability & willingness to incorporate novel ideas and approaches into scientific investigations.

## **Desirable**

1. A broad understanding of quantum physics, quantum computing and its status.
2. Experience in computer programming and/or algorithm development.
3. Experience in applying numerical techniques to solve optimisation problems.
4. A demonstrated interest in the real-world application of research.
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:** 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 others reactions.
* **Resource Management/Leadership:** Allocates activities, directs tasks and manages resources to meet objectives. Provides coaching and on the job training, recognises and supports staff achievements and fosters open communication in the team.
* **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:** Recognise and makes immediate changes to improve performance (faster, better, lower cost, more efficiently, better quality, improved client satisfaction).
* **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.

To be appointed as a CERC Fellow within CSIRO, candidates are required to have **submitted** their doctoral thesis at the time of commencement, as a minimum requirement, if PhD conferment has not been obtained. If a candidate has submitted, but their PhD has not yet been formally attained, the starting salary will be CSOF4-1 ($89,680). Upon CSIRO receiving written confirmation that the PhD has been awarded (within a six-month period from commencement date), the salary will be increased to the negotiated level and the difference will be back-paid to the Officer’s start date.

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/)

**Our value proposition**

We want CERC Fellows to join our world class science, engineering and digital teams to solve big, complex problems that make a real difference to the future of Australia and the world.

You'll get to work with some of the most talented minds in their fields, not just in Australia, but in the world. At CSIRO, we spark off each other, learn from each other, trust each other and collaborate closely to achieve more than we could individually.

Find out more about our CSIRO Early Research Career (CERC) Fellow Experience Employee Value Proposition (EVP) [here](https://www.csiro.au/en/careers/postdoctoral-fellowships).

## **About CSIRO**

We solve the greatest challenges through innovative science and technology. Visit [CSIRO Online](http://www.csiro.au/) and [Manufacturing](https://www.csiro.au/en/Research/MF" \o "Manufacturing- CSIRO Website) 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