# 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 Mathematician/Scientist X-Ray Imaging and Reconstruction |
| Job Reference | 92784 |
| Tenure | Specified Term of 3 years Full-time  |
| Salary Range | AU$92,624 to AU$101,459 pa + up to 15.4% superannuation |
| Location(s) | Lucas Heights, New South Wales, Australia |
| Relocation Assistance | Will be provided to the successful candidate if required |
| Applications are open to | All Candidates |
| Position reports to the | Team Leader, X-Ray Imaging, Mineral Resources |
| Client Focus – Internal | 70% |
| Client Focus – External | 30% |
| Number of Direct Reports | 0 |
| Enquire about this job | Contact Yves Van Haarlem via email at yves.vanhaarlem@csiro.au or phone +61 2 9710 6789 |
| 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 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).

**Child Safety**

CSIRO is committed to the safety and wellbeing of all children and young people involved in our activities and programs. View our [Child Safe Policy](https://www.csiro.au/en/about/policies/child-safe-policy).

### 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 full time equivalent.**

We are looking for CERC Fellow to contribute to the progression of real time X-ray imaging and image reconstruction to characterise valuable metals and minerals in ore among other applications.

*Who are we?*

We are the X-ray Technologies group based at Lucas Heights (Southern Sydney), NSW, Australia. The X-ray technology group is part of CSIRO’s Mineral Resource Business Unit; we are world leaders in the development and commercialisation of technologies that enable the assessment of elemental and mineralogical composition of ore in real-time or near real time. In the recent past we have commercialised technologies such as Chrysos (<https://www.chrysos.com.au/>) and OLGA (https://www.gekkos.com/solutions/olga).

*Where do you fit in?*

In general, you will have the opportunity to pursue innovative ideas and approaches, build and maintain networks and start providing scientific leadership through student supervision.

The CERC Fellow will play a role in developing X-ray imaging technologies, primarily using fast 3D image reconstruction and other image processing techniques that can be analytical, numerical and or AI based. The development will also involve knowledge of X-ray physics, X-ray tubes, flat panels and simulation techniques for supporting parallel experimental work undertaken by you or the team. The overall objective of the work is to develop advanced real-time X-ray imaging systems for bulk ore-sorting and other real time imaging analysis of mineral ores or other application areas such as biosecurity. The CERC Fellow may oversee students and play a major part in implementing technology trials.

### Duties and Key Result Areas

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

* + Appropriate existing 3D image reconstruction algorithms and other image processing and experimental methods, and creating new ones, to measure elements or minerals using X-ray imaging.
	+ Wield knowledge and experience to formulate ideas for new analysers.
	+ Run Monte Carlo and other computer simulations to test ideas and/or validate experiments.
	+ Organise facets of experiments to progress an idea; this includes procurement of hardware, set up equipment like X-ray tubes, flat panels and other detectors, use computer programming to run the experiment and data acquisition.
	+ Analyse experimental data using relevant data science techniques and record, manage and communicate outcomes.
	+ Collaborate with engineers to design and build industrial analyser prototype for testing in industry.
	+ Under supervision of senior researchers, assist in the planning of research proposals and carry out research investigations, requiring originality, creativity and innovation.
	+ Take part in technology field trials in Australia and overseas.
	+ Communicate openly, effectively and respectfully with all staff and suppliers in the interests of good business practice, collaboration and enhancement of CSIRO’s reputation.
	+ Work collaboratively as part of a multi-disciplinary, sometimes regionally dispersed research team, and business unit to carry out tasks in support of CSIRO’s scientific objectives.
	+ Proactively undertake development to grow effective researcher capabilities to support career goals.
	+ Adhere to the spirit and practice of CSIRO’s Values, Code of Conduct, Health, Safety and Environment procedures and policy and diversity initiatives.
* 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 applied mathematics, (nuclear) physics, or physical sciences or computer science/engineering. Please note: To be eligible for this role you must have **no more than 3 years** (or full time equivalent) of relevant research experience.
2. Good theoretical understanding of existing 3D image reconstruction techniques, in particular iterative reconstruction methods.
3. Good image processing skills on noising reduction, segmentation or classification.
4. Demonstrated ability to design and independently deliver research project objectives and report outcomes within a specified timeframe.
5. Good interpersonal skills, including working constructively with research scientists, engineers, support staff and/or client personnel.
6. 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.
7. A sound history of publication in peer reviewed journals and/or authorship of scientific papers, reports, grant applications or patents.
8. A record of science innovation and creativity, including the ability & willingness to incorporate novel ideas and approaches into scientific investigations.

## **Desirable**

1. Good theoretical understanding of physics concepts particularly in the areas of nuclear and/or X-ray physics.
2. Experience in X-ray imaging and 3D image reconstruction techniques for unconventional geometries.
3. Experience in GPU programming.
4. 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 (AU$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 is subject to provision of a pre-employment background check and may be subject to other security/medical/character clearance requirements.

* The successful candidate will undertake a pre-employment background check. Please note that individuals with criminal records are not automatically deemed ineligible. Each application will be considered on its merits.
* The successful candidate will be required to obtain and maintain a security clearance at Lucas Heights, NSW.
* 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 [Mineral Resources](https://www.csiro.au/en/about/people/business-units/Mineral-Resources) 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