# 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 Diffraction Contrast Tomography for Earth and Planetary Sciences |
| Job Reference | 79616 |
| Tenure | Specified Term of 3 years  Full-time |
| Salary Range | AU$89,926 to AU$98,504 pa + up to 15.4% superannuation |
| Location(s) | Kensington, WA |
| Relocation Assistance | Will be provided to the successful candidate if required |
| Applications are open to | Australian/New Zealand Citizens, Australian Permanent Residents and Australian temporary residents currently residing in Australia (visa sponsorship may be provided to eligible onshore candidates) |
| Position reports to the | Team Leader |
| Client Focus – Internal | 100% |
| Client Focus – External | 0% |
| Number of Direct Reports | 0 |
| Enquire about this job | Contact Belinda Godel via email at belinda.godel@csiro.au or phone +61 8 6436 8908 |
| 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 area 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 full-time or equivalent.**

The Postdoctoral Fellow will join the Characterisation Program within the CSIRO Mineral Resources Business Unit to develop the application of Diffraction Contrast Tomography for Earth and Planetary Sciences. Understanding how crystals and minerals are distributed within natural materials and their characteristics (referred to as material texture) is key to understanding fundamental processes across a range of fields. For the Resources sector, it can provide invaluable

insights into (a) how these materials form, thus informing mineral exploration strategies, and (b) how that same material will behave from a mining engineering perspective or while being subjected to physical and chemical constraints for example during leaching (metal extraction) or as a result of fluid/rock interaction (e.g., CO2 during carbon capture storage).

Non-destructive high-resolution X-ray computed tomography (HRXCT) has become the method of choice for understanding the 3D textures of natural materials and has provided unprecedented insights into some of the most fundamental questions in applied Earth and Planetary. Recently, the advent of Diffraction Contrast Tomography (DCT) has allowed the mapping of crystallographic orientations of polycrystalline samples in 3D. DCT is a non-destructive technique that was originally implemented in a limited number of synchrotron facilities across the globe but is now also available in the laboratory using low brilliance polychromatic sources. The 3D/4D high-resolution X-ray microscope installed at the Australian Resources Research Centre (Perth, Western-Australia), is equipped with DCT technology. Currently, DCT applications to natural systems are extremely limited due to the rarity of the technology.

The project aims at providing a golden opportunity for an enterprising, creative, innovative and agile Early Career Scientist to lead the DCT application development further. The Postdoctoral Fellow will use a range of 2D and 3D correlative microscopy techniques and data analytics at multiscale to drive discoveries across a range of applications relevant to Earth and Planetary science and with direct relevance to multiple industries.

### Duties and Key Result Areas:

Under the direction of a senior research scientist, the successful candidate will:

* Carry out innovative, impactful research and development of strategic importance to aligned with the goals of the Characterisation program that will, where possible, lead to novel and important scientific outcomes.
* Develop new applications of diffraction contrast tomography for Earth and Planetary Sciences by combining and analysing a range of 2D and 3D correlative techniques at multiscale.
* Develop new workflows and algorithms for data fusion and processing.
* Develop a range of high-level skills such as advanced multiscale characterization, correlative microscopy, mineralogy, crystallography, applied geosciences and digital capabilities (image processing, computer vision and machine learning).
* Undertake regular reviews of relevant literature and intellectual property.
* Write high quality scientific peer-reviewed documents highlighting key results (ranging from methodology papers to example of application answering a particular problem) suitable for publication in high quality international scientific journals, presentation to clients, and/or applications for patents.
* Prepare material and present at relevant national and international conferences and/ or seminars and industry-workshops.
* Contribute to various existing collaboration / projects with industry or universities across the globe.
* Contribute to the development of new innovative concepts and methodologies and progress opportunities for the further development or creation of new lines of research and help deliver to CSIRO’s organisational objectives, plans, and strategies.
* Develop (with relevant supervisor) and undertake a learning, development, and training programto develop capabilities to the level expected of an independent researcher.
* 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.

## **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.

## **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 Geosciences, Material Sciences, Planetary Sciences or Physics.

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

1. Experience in at least two relevant 2D and/or 3D microscopy and characterisation techniques such as X-ray computed tomography, diffraction contrast tomography, scanning electron microscopy, electron back scattered diffraction, electron microprobe, X-ray fluorescence mapping and LA-ICP-MS or any other material characterisation techniques.
2. 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.
3. A sound history of publication in peer reviewed journals and/or authorship of scientific papers, reports, grant applications or patents.
4. A record of science innovation and creativity, including the ability & willingness to incorporate novel ideas and approaches into scientific investigations.

## **Desirable:**

1. Demonstrated experience and skill in programming (Python and/or Matlab) is highly desirable.
2. Demonstrated experience in image analysis and quantification is highly desirable.
3. Experience in computer vision and machine learning.
4. Remain productive, positive and resilient in complex, ambiguous and/or uncertain environments.
5. **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.**

To be appointed to this CERC Fellowship role within CSIRO, candidates will be expected to commence employment by 30 June 2022. 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$87,068). 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 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 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. To find out more visit us [online](http://www.csiro.au/)!

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

Find out more about CSIRO [Mineral Resources](https://www.csiro.au/en/Research/MRF)