# 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 Spatial Analysis/Applied Statistics – Mineral Systems |
| Job Reference | 84101 |
| 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) | Canberra, ACT, Ngunnawal Country   * CSIRO Black Mountain Science and Innovation Park * Embedded onsite with Geoscience Australia for a minimum of 3 days a week |
| Relocation Assistance | Will be provided to the successful candidate if applicable |
| Applications are open to | All Candidates |
| Position reports to the | Team Leader Advanced Inversion Techniques |
| Client Focus – Internal | 20% |
| Client Focus – External | 80% |
| Number of Direct Reports | 0 |
| Enquire about this job | Contact Juerg Hauser via email at juerg.hauser@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 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 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 discovery of statistically robust relationships between known mineral deposits and a wide range of geoscience datasets, for example, aspects of geophysical-imaged lithospheric architecture, has given rise to a class of questions centred around which geoscience datasets and which features are important to use, how to best transform potentially multidimensional data to feed into mineral potential assessments, and how to statistically account for uneven data coverage, data uncertainty and spatial bias. Under the MinEx Cooperative Research Centre research collaboration, CSIRO and Geoscience Australia are working together to develop a new set of innovative exploration tools to help address these challenges (https://minexcrc.com.au/about-minex-crc/what-is-minex-crc/). As a member of the CSIRO Mineral Resources Discovery Program and an embedded researcher at Geoscience Australia, the postdoctoral fellow will play an integral role in this collaboration. The candidates' research is anticipated to be centred around developing and deploying state of the art statistical methods (informed from fields including Bayesian geophysical inversion, machine learning and artificial intelligence, and/or geostatistics) to enhance the predictive power of prospectivity mapping. This will require, for example, the integration of a wide range of geoscience datasets and the development of novel methods for feature extraction. The first phase of the project will focus on geophysical data and products, but will later shift towards exploring avenues to harness the information contained in geological, geochemical and geochronological datasets.

The position will also provide the candidate with an opportunity to establish collaborative links with Exploring for the Future. The Australian Government’s $225 million Exploring for the Future program led by Geoscience Australia (GA) is committed to supporting a strong economy, resilient society and sustainable environment for the benefit of Australians (https://www.ga.gov.au/eftf). At its heart, the program is about stimulating industry now to ensure a sustainable, long-term future for Australia through an improved understanding of the nation’s minerals, energy and groundwater resource potential. By gathering and analysing geological and geophysical data and making the results publicly available, the program supports regional development and informed decision making across Australia, resulting in jobs and growth. The delivery of pre-competitive geoscience datasets for resource exploration by government to the mineral exploration industry has been shown to support the discovery of economically significant mineralisation such as the Julimar Nickel-PGE project and the Lake Wells potash deposit, both of which are in Western Australia (http://pid.geoscience.gov.au/dataset/ga/145195).

### The CERC Fellow will be employed as a member of CSIRO Mineral Resources (CMR), one of the largest minerals research and development groups globally, with a proud track record in delivering innovation and solutions across the mineral resources value chain. CMR thrives on innovation harnessed by the diversity of the minds and lived experiences of our team and apply our expert knowledge and specialised research to provide innovation that solves the complex problems faced by minerals companies, mining equipment, technology, and services (METS) companies, government, and other industry stakeholders. The CMR Discovery Program aims to be a truly diverse team that reflects the diversity that we see in society, and comprises an enthusiastic multidisciplinary team of STEM researchers, all focused on developing new technologies and concepts for exploration through cover and advancing orebody knowledge.

### The team recognises that Aboriginal and Torres Strait Islander peoples have made and will continue to make extraordinary contributions to Australian culture, economy and science and we aim to promote and support the vision of ‘A science landscape in respectful partnership with Indigenous Australia delivering innovative, sustainable, holistic solutions to meet our greatest national challenges’. The position will be based at Geoscience Australia and CSIRO’s Black Mountain Site in Canberra, on Ngunnawal Country.

### While working at CSIRO, you will be able to create a dynamic career path leveraging from your own experiences and identity. You will have access to a range of world-class facilities based at local universities where CSIRO has collaborative arrangements in place, and at other CSIRO sites across Australia. CSIRO provides an attractive remuneration package that includes a generous superannuation scheme, flexible work options, travel, and multiple leave options including paid maternity and parental leave.

### CSIRO is also a member of the Science in Australia Gender Equity (SAGE) pilot, holds Gold Employer Status through the AWEI (Australian Workplace Equality Index), which sets a comparative benchmark for LGBTIQ+ inclusion for employers across all sectors and is committed to reconciliation with Aboriginal and Torres Strait Islander Peoples’.

### Duties and Key Result Areas:

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

* + Use state of the art statistical methods to quantify the predictive power of geological, geochemical and geophysical datasets for mapping mineral system potential.
  + Develop and design new tools, methods and workflows to identify and rank predictors of mineral system potential by examining the distribution of global and Australian mineral deposits.
  + Identify which prospectivity mapping relevant datasets are most valuable for scale reduction workflows and develop concepts to allow to use datasets at different scales.
  + Play a significant role in communicating research or technological results in internal and external forums and, where applicable, contribute to and/or generate scientific papers.
  + Initiate and maintain collaborative relationships with researchers at GA, CSIRO and within MinExCRC.
  + Communicate openly, effectively and respectfully with all staff, clients and suppliers in the interests of good business practice, collaboration and enhancement of CSIRO’s reputation.
  + Work collaboratively as part of a multi-disciplinary, regionally dispersed research team to carry out tasks in support of CSIRO’s, GA’s and the MinExCRC’s scientific objectives.
  + Adhere to the spirit and practice of CSIRO’s and GA’s Values, Code of Conduct, Health, Safety and Environment procedures and policy, Diversity initiatives and Making Safety Personal 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, and
* working and collaborating with others.

## **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) in a relevant discipline area such as Geophysics, Mathematical Geosciences, Geostatistics, Applied Statistics, or Applied Mathematics.

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

1. A passion for the development and implementation of complex mathematical concepts and algorithms for geoscientific inference.
2. Demonstrated ability to work within a multidisciplinary and diverse research team, and the motivation and discipline to carry out independent research to achieve organisational goals.
3. A capability to build and maintain effective working relationships with stakeholders from a range of backgrounds including industry, education, government and academia.
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. Experience working in/with the minerals industry or research projects with industry support, focusing on multi-scale data integration for mineral exploration.
2. Experience using spatial data ideally around mapping/predicting mineral systems across scales targeting potential mineral deposits.
3. Experience working with spatial data, including geophysical data.
4. Experience sourcing, preparing, aggregating, and integrating small- to large-scale data sets into 2D or 3D GIS-based prospectivity/exploration targeting models.
5. Experience with prospectivity mapping/modelling and with Python or R scripting for advanced data processing and analysis.
6. Experience with machine learning / artificial intelligence, and the applications of these to within geoscientific research.

To be appointed as a Postdoctoral Fellow within CSIRO, the successful candidate will be expected to have **submitted** their PhD 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)

Find out more about [Geoscience Australia](https://www.ga.gov.au/)