# 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 Hyperspectral Sensing |
| Job Reference | 77905 |
| 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) | Adelaide, SA |
| 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 | Research Scientist |
| Client Focus – Internal | 100% |
| Client Focus – External | 0% |
| Number of Direct Reports | 0 |
| Enquire about this job | Contact Nina Welti via email at nina.welti@csiro.au or phone +61 8 8273 8145 |
| 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 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) Postdoctoral Fellowships** provide opportunities to scientists and engineers who have completed their doctorate and have less than three years relevant postdoctoral work 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 Postdoctoral Fellows **are appointed for three years or part time equivalent.**

This Fellowship is part of the **Autonomous Sensing Future Science Platform,** offering new opportunities to work on frontier science to accelerate the generation of new tools to enable growth of digital decision making within domains; combining fundamental sensor research with autonomous engineering solutions to provide new advanced sensing and platform technologies for the environmental monitoring, health monitoring, mining, agriculture, and manufacturing domains.

The Postdoctoral Fellow will have expertise with hyperspectral sensing and be interested in developing new sensing-based methods to predict regionally significant distinctions in soils and agricultural products to verify the production origin and associated products.

### Duties and Key Result Areas:

* Development of physics-based model and sensor response to quantify key environmental elemental characteristics in noisy, cluttered backgrounds
* Prediction and estimation of elemental composition of spatial, spectral, and temporal signatures in environmental applications
* Analyse the performance and accuracy of relevant data sets in comparison with ground-based measurements and similar multispectral data, including lab-based and portable handheld sensors (Portable X-Ray Fluorescence; pXRF, Laser-Induced Breakdown Spectroscopy; LIBS, Fourier transform infrared – FTIR, Vis-NIR, MIR, FIR)
* Development of data fusion methods to maximize efficiency and accuracy for single and multi-sensor approaches.
* Generate workflows describing implementation of data sets in prioritised applications

Under the direction of senior research scientists and engineers, CERC Postdoctoral Fellows:

* + 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
	+ 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.
* Other duties as directed.

[**The CERC Postdoctoral Fellow learning and development program**](http://www.csiro.au/en/Careers/Student-and-graduate-programs/Postdoctoral-fellowships)is developed between the CERC Postdoctoral Fellow and their CSIRO supervisor. The program will focus on enhancing the Fellows’ 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

## **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 the physical sciences (physics, chemistry, environmental science, geosciences, mathematics, or a closely related field)

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

1. Excellent experimental and measurement skills and an expert-level understanding of at least one spectroscopic technique (for example XRF, LIBS, Fourier transform infrared – FTIR) and associated analysis
2. High level written and oral communication skills with the ability to represent the research team effectively internally and externally, both written and oral.
3. A record of science innovation and creativity, including the ability & willingness to incorporate novel ideas and approaches into scientific investigations.
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**

## **Desirable:**

1. Competency with image processing software, such as but not limited to ENVI, ERDAS Imagine, ArcGIS, Adobe Geographic Imager
2. Experience developing fundamental physical models, data analysis algorithms, and/or sensor concepts involving remote sensing for environmental, mineral extraction, or agricultural applications.
3. Experience with computer programming, such as but not limited to Python, C, C++, and Matlab
4. Familiarity with and/or development of spectral image processing methods, including processing to reflectance, chemometrics, and detection and identification algorithms.
5. Understanding of basic land remote sensing derivatives and applications
6. Familiarity with spatial image processing and analysis, and geospatial information system (GIS) algorithms.
7. Familiarity with data science including analysis and reduction techniques, numerical algorithms, control systems, big data and deep learning concepts.
8. Remain productive, positive and resilient in complex, ambiguous and/or uncertain environments.
9. A current driver’s licence.

To be appointed as a CERC Postdoctoral Fellow within CSIRO, candidates are required 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 Postdoc 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.

CSIRO Early Research Career (CERC) Postdoctoral Fellow Experience Employee Value Proposition (EVP). Find out more [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/)!

Find out more about CSIRO [Agriculture and Food](https://www.csiro.au/en/Research/AF)

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