# 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 Research Facility Monitoring Using Collaborative Intelligence |
| Job Reference | 84767 |
| Tenure | Specified Term of 3 years Full-time |
| Salary Range | AU$89,923 to AU$98,504 pa + up to 15.4% superannuation |
| Location(s) | Perth, WA or Sydney, NSW |
| Relocation Assistance | Will be provided to the successful candidate if required |
| Applications are open to | All Candidates |
| Position reports to the | ASKAP Lead Scientist and Head of Science Operations |
| Client Focus – Internal | 100% |
| Client Focus – External | 0% |
| Number of Direct Reports | 0 |
| Enquire about this job | Contact Aidan Hotan via email at aidan.hotan@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 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) 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 full-time or equivalent.**

The CERC Postdoctoral Fellow will be embedded in CSIRO’s new Collaborative Intelligence (CINTEL) Future Science Platform (FSP). Future Science Platforms (FSPs) are an investment in science that underpins innovation and that has the potential to help reinvent and create new industries for Australia.

The **Collaborative Intelligence (CINTEL) FSP** will develop the science that enables human intelligence and technology to work harmoniously together across multiple domains, exceeding the performance of either alone. This is needed as there is growingacknowledgement that the best results ensue when humans work *collaboratively* with machines in both physical and virtual/digital worlds.

The **CINTEL** **FSP** is about exploring “collaborative intelligence” and developing the science required to integrate artificial and human intelligence and produce a general-purpose technology which could have a transformative impact across a wide range of industries and domains. This in turn will lead to greater adoption and effective use of technology, enhanced productivity, and safety. The FSP will also explore how people and machines work and learn together, while ensuring meaningful and rewarding work for people, where machines augment rather than substitute human intellect. Achieving this will require **an interdisciplinary approach**, bringing together experts in social science, engineering, and computer science, with domain expertise in the areas in which collaborative intelligence is to be deployed.

The CERC Fellow will be part of a cohort of early career researchers working with top CSIRO scientists and engineers to partner human and machine intelligence in symbiotic relationships. In this specific position, the Fellow will work with Australia’s latest radio astronomy national facility, ASKAP**.** This world-class research telescope array produces wide-field, high-resolution images of the radio sky using 6768 sensors spread over 36 dish antennas, each 12 m in diameter. Custom signal processing hardware operating in a remote outback location extracts key information from the raw data, sending up to 2 GB/s to the Pawsey supercomputing centre in Perth for imaging. The telescope is designed to be highly automated, with a sophisticated control system that has access to half a million monitoring points. However, the level of complexity and the potential for outside interference (from satellites, solar weather, etc.) defies traditional operations models. Interpreting the severity of alarms and tracing faults detected in astronomy diagnostics back to a system-level cause is a prime example of where the CINTEL approach could increase ASKAP’s scientific impact significantly.Research questions include how humans and AI components can collaborate with each other to identify, understand, and solve problems when there are many intermediate steps that isolate cause and effect.

### Duties and Key Result Areas:

The successful applicant will work with a diverse range of people across the ASKAP team, using their unique perspective to identify and develop CINTEL-based improvements. Building on existing AI diagnostic tools and the experience of ASKAP staff, the successful candidate will design a CINTEL framework, then work with ASKAP software engineers and operations staff to implement and test it under real observing conditions.

Under the direction of domain experts, CERC Postdoctoral Fellows:

* Carry out innovative, impactful research of strategic importance to CSIRO that will, where possible, lead to novel and important scientific outcomes. In this project, the Fellow will be required to articulate and solve research challenges associated with designing an effective human/computer collaborative workflow in the context of monitoring a large-scale radio astronomy observatory.
* Recognise and act on opportunities for innovation and the generation of new theoretical perspectives, and progress opportunities for the further development or creation of new lines of research, including performing systematic literature surveys of research relevant to the field.
* Carry out research investigations within a multidisciplinary team, requiring originality, creativity, and innovation, including the planning, design, conduct and quantitative analysis of data from empirical studies involving human participants. This position also requires an ability to conduct qualitative inquiry to gather relevant knowledge from a variety of stakeholders and translate findings from both quantitative and qualitative research.
* Produce high quality research publications and publish in various high-profile venues.
* Represent CSIRO externally, including in public forums such as academic conferences, with industry or the research sector or with Government, including collaborating with stakeholders and academic partners as required.
* 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(s). 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

Since this is an emerging, cross-disciplinary research field, we will be considering applicants with a wide range of background experience. If your knowledge and interests align with the general goals as described above, please do not hesitate to apply. We welcome new perspectives.

## **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 Computer Science, Software Engineering, Astrophysics, Machine Learning, Human-Computer Interfaces, or other broadly related field in physical science or engineering.

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. Demonstrated research experience in a multidisciplinary team environment, in areas relevant to the broad theme of collaborative intelligence as described previously.
2. **The ability to work effectively as part of a multi-disciplinary, regionally dispersed research team, plus the motivation and discipline to carry out autonomous research.**
3. High level written and oral communication skills with the ability to represent the research team effectively internally and externally, to people with varying levels of domain-specific knowledge.

## **Desirable:**

1. Previous experience working in Human-Computer Interaction (HCI).
2. Previous research experience working with Artificial Intelligence or Machine Learning techniques.
3. Experience with operational procedures at a major research facility such as an observatory, particle accelerator, space mission operations centre, etc.
4. Experience prototyping new systems and methods using common scripting languages such as Python and integrating new features into production environments.

To be appointed to this CERC Fellowship role within CSIRO, candidates will be expected to commence employment by December 2022. 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 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 [Space and Astronomy](https://www.csiro.au/en/about/people/business-units/Space-and-Astronomy) 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