# 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 Bushfire Ember Aerodynamics and Combustion |
| Job Reference | 90925 |
| Tenure | Specified Term of 3 years  Full-time |
| Salary Range | AU$92,624 to AU$101,459 pa (pro-rata for part-time) + up to 15.4% superannuation |
| Location(s) | Canberra (Black Mountain), ACT |
| Relocation Assistance | Will be provided to the successful candidate if required |
| Applications are open to | All candidates (incl. Internationals) |
| Position reports to the | Research Team Leader, Bushfire Behaviour and Suppression |
| Client Focus – Internal | 100% |
| Client Focus – External | 0% |
| Number of Direct Reports | 0 |
| Enquire about this job | Contact Andrew Sullivan via email at Andrew.Sullivan@csiro.au or phone +61 2 6246 4051 |
| 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 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) 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.**

The occurrence of new fire ignitions ahead of a wildfire (called ‘spot fires’), ignited by the transport of burning debris downwind from the combustion zone of the main fire, are the primary cause of wildfires (or ‘bushfires’) escaping containment, the life-threatening entrapment of firefighters and members of the general public, and the loss of houses and other structures. Situations in which burning debris (such as embers or ‘firebrands’) are lofted in the wildfire’s plume and carried by the prevailing wind, can lead to spot fires occurring many kilometres from the fire (up to 40 km in some instances) if a viable firebrand lands and starts a new fire.

This CERC Fellowship provides an opportunity for a suitable candidate to join the CSIRO Bushfire Behaviour and Suppression team and contribute to the ongoing development of knowledge critical to the management of bushfires in Australia and around the world, improving the operational preparation for and response to wildfires, and increasing society’s resilience to one of the world’s most dangerous natural phenomena.

The role of the CERC Fellow will be to undertake novel experimental research into the aerodynamic and combustion characteristics of common firebrands and to develop innovative theoretical models of firebrand flight and ignition viability. The research will use the CSIRO Vertical Wind Tunnel located at the National Bushfire Behaviour Research Laboratory (NBBRL) in Canberra, Australia, and will lead to improved operational predictions of spot fire occurrence during wildfires.

The ideal candidate will be self-motivated and have a sturdy work ethic. They will have a strong background in physical experimentation and applied physics (in particular experimental design, data acquisition and analysis, and modelling of fluid mechanics or similar) and the ability to work in a team and as well as by themselves. An interest in application of modern theoretical physics concepts to the problem of firebrand dispersal would be advantageous.

### Duties and Key Result Areas

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

* Develop and advance a new impactful research stream within the broader research portfolio of the Bushfire Behaviour and Suppression team in the NBBRL focused on the phenomenon of spotting (the formation of spot fires) and firebrand/ember transport and dispersal.
* Carry out creative experimental research in which innovative methodologies and theoretical frameworks are created or applied to reliably quantify and model flight and combustion characteristics of common firebrands, mostly tree bark, using the CSIRO Vertical Wind tunnel in the NBBRL and implementing unique data acquisition methods for the purpose of developing predictive operational tools.
* Recognise and exploit opportunities for innovation and the generation of new theoretical perspectives in the research area, and progress opportunities for the further development or creation of new lines of research.
* Manage, operate and modify the CSIRO Vertical Wind Tunnel as required to meet specific experimental needs.
* Proactively undertake professional development to grow effective researcher capabilities to support career goals.
* Publish research results in high impact journals and present findings at appropriate international science meetings.
* Engage with rural fire operations and research community members to effectively communicate research directions and outcomes to facilitate research uptake and achieve impact from your research.
  + Record, manage, and analyse data/information using relevant domain data science techniques.
  + Adhere to the spirit and practice of CSIRO’s Code of Conduct, Health, Safety and Environment procedures and policy, Diversity initiatives and Zero Harm 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
* 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 physics, engineering or mathematics.

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

1. Experience of research in wind tunnel operation, fluid mechanics, fluid dynamics, turbulence, or combustion; experience in the study of atmospheric boundary layer or general meteorology would also be highly regarded.
2. Knowledge and experience working in an experimental research environment involving sensor deployment and data acquisition.
3. Strong mathematical background in data analysis and modelling.
4. Be physically able to manage and operate the vertical wind tunnel (accessible only by stairs across three floors) subject to WH&S approvals.
5. The ability to learn new skills and knowledge and apply those newly minted skills and knowledge in a robust and effective manner to address the problems at hand.
6. High level written and oral communication skills with the ability to convey complex research concepts effectively to a broad range of internal and external audiences across a variety of media.

## **Desirable**

1. The ability to remain productive, positive and resilient in complex, ambiguous or uncertain situations.
2. **The ability to work effectively as part of a multi-disciplinary and regionally-dispersed research team, and the motivation and discipline to carry out autonomous research.**
3. Experience of publication in peer reviewed journals and/or authorship of scientific papers, reports, grant applications or patents.

## **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 to this CERC Fellowship role within CSIRO, candidates will be expected to commence employment by 11 August 2023. Candidates are also 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 ($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 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 Clearance or equivalent. Please note that individuals with criminal records are not automatically deemed ineligible. Each application will be considered on its merits.
* The successful candidate may be required to undertake a pre-employment medical examination prior to commencement.
* 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 [Land and Water](https://www.csiro.au/en/Research/LWF" \o "Land & Water- CSIRO Website) 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