# 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 Perovskite Solar Cells |
| Job Reference | 86969 |
| 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) | Clayton, Victoria |
| 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 | Supervisor |
| Client Focus – Internal | 100% |
| Client Focus – External | 0% |
| Number of Direct Reports | 0 |
| Enquire about this job | Dr Dechan Angmo via email at dechan.angmo@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 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.** They will work closely with a leading Research Scientist or Engineer in their respective field. They carry out innovative, impactful research of strategic importance to CSIRO with the possibility of novel and important scientific outcomes. They present the findings in appropriate publications, at conferences, and explore potential intellectual properties.

CSIRO Manufacturing has dedicated group of teams focusing on renewable energy technologies, particularly towards developing scalable materials and manufacturing processes. Next generation of photovoltaic materials, processes, and manufacturing is a key focus area. Our Printed PV group now welcomes a self-motivated and innovative CERC Fellow from a physical chemistry, chemistry, physics, engineering or materials science background wanting to join an exciting, interdisciplinary team in the priority area of Perovskite semiconductors.

***Science Background – Perovskite solar cells***

Metal-halide perovskite materials have emerged as an inexpensive and revolutionary family of photoactive semiconductors in thin-film photovoltaics Metal-halide perovskite have emerged as an inexpensive and revolutionary family of photovoltaic (PV) materials owing to their simple fabrication processes and inexpensive and abundant raw materials, which can rapidly penetrate an expanding PV market. Our research team is investigating materials and processes to increase device performance, and stability unique to requirements of certain PV markets. This Fellowship will work on materials investigation, their characterisation in collaboration with university partners on the project and developing upscaling processes. The CERC Fellow will work independently with guidance and support from experienced scientists and collaborators. The CERC Fellow will have access to world class facilities at CSIRO and at our partners and is expected generate high quality scientific manuscripts and explore opportunities at generating IP.

Candidates must have a high motivation for innovation, excellence, and flexibility to work and deliver results. Candidates are expected to **work independently to pursue the challenge goals, and** bring excellent organisational and time-management skills; excellent communication skills, including the capacity to offer thoughtful and clear technical guidance on research projects; and clear and efficient writing.

### Duties and Key Result Areas

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

* + Plan and carry out research investigations requiring originality, creativity, and innovation

that contributes and expands on existing photovoltaic research within the Printed PV team.

* Design, implement and conduct research in the fabrication and characterisation of perovskite solar cells.
* Incorporate novel approaches to scientific investigations by adapting and/or developing original concepts and ideas for new, existing and further research.
* Research and develop new device designs, fabrication processes and characterisation methods for the fundamental understanding of photovoltaic function as it applies to cell performance of perovskite semiconductors.
* Undertake regular reviews of relevant literature and patents.
* Produce high quality scientific suitable for publication in quality journals and granting of patents.
* Prepare appropriate conference papers and present those at conferences as agreed with your supervisor.
* Contribute to the effective functioning of the research team and help deliver CSIRO’s organisational objectives and plans.
  + 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 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 Materials Science and Engineering, Chemistry, Physical Chemistry, Physics, or other areas relevant to Photovoltaics.

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

1. 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.
2. A sound history of publication in peer reviewed journals and/or authorship of scientific papers, reports, grant applications or patents.
3. A record of science innovation and creativity, including the ability & willingness to incorporate novel ideas and approaches into scientific investigations.
4. Detailed fundamental knowledge of physical chemistry and solid-state physics as it relates to photovoltaic function.
5. Experience in perovskite solar cells and a strong understanding of the fundamental issues and present challenges relating perovskite solar cells.
6. Enthusiasm for and experience with laboratory work including fabrication of devices and the physical, chemical and electrochemical characterisation of PV devices, particularly perovskite solar cells.
7. Relevant experience in solution processed thin-film photovoltaics, especially perovskite solar cells, such as fabrication and device characterisation.
8. **The ability to work effectively as part of a multi-disciplinary teams, and the motivation and discipline to effectively carry out autonomous research.**
9. A record of science innovation and creativity, plus the ability and willingness to incorporate novel ideas and approaches into scientific investigations.

## **Desirable**

1. Experience with upscaling of perovskite solar cells.
2. Expertise in materials characterisation such as Grazing incidence X-ray diffraction, Scanning Electron Microscope, Transmission Electron microscope.
3. Expertise in optical characterisation such as photoluminescence, electroluminescence, LBIC, etc.

## **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 31 January 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 ($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.

Applicants who are not Australian Citizens or Permanent Residents may be required to undergo additional security clearance processes; which may include medical examinations and an international standardised test of English language proficiency (i.e. IELTS test).- http://www.ielts.org/default.aspx

**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 [Manufacturing](https://www.csiro.au/en/Research/MF" \o "Manufacturing- 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