# 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 non-thermal plasma technology for CO2 hydrogenation to liquid methanol |
| Job Reference | 95398 |
| Tenure | Specified Term of 3 years Full-time  |
| Salary Range | AU$92,624 to AU$101,459 pa (pro-rata for part-time) plus up to 15.4% superannuation |
| Location(s) | Clayton, Victoria |
| Relocation Assistance | Will be provided to the successful candidate if required |
| Applications are open to | All Candidates |
| Position reports to the | Team leader |
| Client Focus – Internal | 80% |
| Client Focus – External | 20% |
| Number of Direct Reports | 1 |
| Enquire about this job | Contact Yunxia Yang via email at Yunxia.Yang@csiro.au or Dr. Tony Murphy at tony.murphy@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).

**Child Safety**

CSIRO is committed to the safety and wellbeing of all children and young people involved in our activities and programs. View our [Child Safe Policy](https://www.csiro.au/en/about/policies/child-safe-policy).

### 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 CERC Fellow will lead a project that will encompass a broad range of cutting-edge technologies. They will benefit from working with a wide range of subject matter experts in the areas of material synthesis, catalysis and plasma technology while independently delivering the experimental program.

Recent research indicates that the plasma-enhanced reaction process can achieve high levels of CO2 conversion and selectivity at significantly reduced temperatures. However, research on converting CO2 to methanol using non-thermal plasma technology is very limited. The CERC Fellow will work on developing catalysts and investigating process chemistry for non-thermal plasma CO2 conversion to methanol using different analytical techniques.

The supervisory research team has a well-established reputation in catalysis and plasma technology worldwide. During the course of the project, the fellow will be encouraged to spend time in the mentor supervisor’s lab and various CSIRO labs as an immersive learning experience and to establish a broad network of scientific contacts.

CSIRO’s Clayton site has world-class facilities for catalyst synthesis, characterisation and testing. These include a High-Throughput Flow Testing facility for fast screening of the catalysts and versatile testing rigs for performance evaluation, including plasma catalysis reactors and power supplies. The Lindfield laboratories have excellent facilities for development and diagnostics of plasma processes, which include power supplies and diagnostics that are readily transferrable to the Clayton site.

Ample opportunity will be provided for the fellow to present scientific outcomes at local and international conferences as well as to CSIRO industrial collaborators and partners (as appropriate).

### Duties and Key Result Areas

The fellow will be expected to conduct the following specific activities:

* Work with the supervisory team to design and fabricate a novel plasma reactor with optimised energy efficiency for CO2-to-methanol conversion.
* Optimise the synthesis of catalyst materials for these plasma conditions.
* Design and set up analytical equipment necessary for the research.
* Carry out experiments to evaluate materials and reactors.
* Analysing and interpreting data to write publications and prepare proposals.
* Utilise both internal and external science networks to broaden expertise and guide delivery of project objectives.

Under the direction of supervisors and engineers, this CERC Fellow will:

* + 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.
	+ Utilise design thinking methodology to plan and prepare research proposals, and apply non-academic impact methodology to research projects.
	+ Carry out research investigations requiring originality, creativity and innovation.
	+ Record, manage, and analyse data/information using relevant domain data science techniques.
	+ Be able to communicate data and results in both oral and written format, generating impact in both research and relevant industry communities.
	+ Proactively undertake development to grow effective research capabilities to support career goals.
	+ Adhere to the spirit and practice of CSIRO’s Values, Code of Conduct, Health, Safety and Environment procedures and policy and diversity initiatives.
* 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 in a relevant discipline area, such as Chemical Engineering, Materials Science, Chemistry, Science or related disciplines.

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

1. Experience related to catalyst materials synthesis and catalysis.
2. Knowledge and experience related to reactor design, fabrication and testing.
3. High level written and oral communication skills with the ability to represent the research effectively to both internal and external audiences, including presentation of research outcomes in publications and at national and international conferences.
4. A record of science innovation and creativity, including the ability & willingness to incorporate novel ideas and approaches into scientific investigations.
5. A sound track record of publications in peer reviewed journals and/or authorship of scientific papers, reports, grant applications or patents.
6. A record of science innovation and creativity, including the ability & willingness to incorporate novel ideas and approaches into scientific investigations.

## **Desirable**

1. Knowledge and experience related to non-thermal plasmas.
2. Knowledge and experience related to CO2 hydrogenation.
3. Knowledge and experience in reactor design, rig operation and handling.
4. Knowledge and experience in analytical equipment operation and results analysis.
5. Knowledge and experience with in-situ DRIFT analysis and Density functional Theory calculation.
6. Problem solving skills, ability to identify and leverage resources to tackle problems.
7. Remain productive, positive, and resilient in complex, ambiguous and/or uncertain environments.
8. **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.**

## **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 30 June 2024**. 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 is subject to provision of a pre-employment background check and may be subject to other security/medical/character clearance requirements.

* The successful candidate will undertake a pre-employment background check. Please note that individuals with criminal records are not automatically deemed ineligible. Each application will be considered on its merits.
* The successful candidate will 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.

**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/career-opportunities/Postdoctoral-fellowships).

## **About CSIRO**

We solve the greatest challenges through innovative science and technology. Visit [CSIRO Online](http://www.csiro.au/) and CSIRO [Energy](https://www.csiro.au/en/Research/EF) 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