# 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 Green Steel |
| Job Reference | 97164 |
| Tenure | Specified Term of 3 years  Full-time |
| Salary Range | AU$96,329 to AU$105,517 pa (pro-rata for part-time)  plus up to 15.4% superannuation |
| Location(s) | Clayton, VIC |
| 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 | 50% |
| Client Focus – External | 50% |
| Number of Direct Reports | 0 |
| Enquire about this job | Contact Chunlin Chen via email at [Chunlin.chen@csiro.au](mailto:Chunlin.chen@csiro.au) or phone +61 4 9545 8530 |
| 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).

**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 conduct research in developing green Ironmaking routes for Australian iron ores. They are expected to take an active role in developing green processing routes for iron production. The project aims at developing understanding of how Australian iron ores (particularly, Pilbara Iron ores but not excluding other ores) perform using different green ironmaking routes; notably, Hydrogen Shaft Direct Reduced Iron (DRI) (pellet based), Hydrogen Fluidized Bed DRI (fines based) and Hydrogen Flash Reduction DRI (fine based). The project will focus on fundamental aspects of these processes, such as the reducibility of the ores, the behaviour of gangue materials during processing and deportment of phosphorous into different phases. The project will also examine how these different DRI products would perform in subsequent electric melting furnaces, in terms of melting behaviour and slag generation. These studies will feed into related studies looking at the techno-economic repercussions of feeding these ores into different processing routes. The proposed project will design, develop and demonstrate sub-pilot scale testing facilities (capable of producing greater 10kg of products) to test basic concepts and allow assessment of fundamental aspects of the process.The project, in particular, will:

1. Design, develop and commission a sub-pilot scale fluidized bed reactor.
2. Commission a sub-pilot scale Electric Smelting Furnace suitable for testing different DRI products (either produced internally or obtained externally)
3. Test different input materials (ores) and conditions in the sub-pilot sale reactors.
4. Work with other organisations that are generating new DRI products for testing in the facilities developed.
5. Collaborate with other researchers internally within CSIRO and University partners working on related problems.
6. Critically evaluate the different options for processing Australian ores and feed detailed information to other project developing models and techno-economic assessments of these issues.

This project and position will be carried out under the new Swinburne University of Technology / CSIRO joint program on Sustainable Mineral Processing and Green Steel. This partnership was established to tackle global decarbonization with innovative green steel and critical metals research and development. The collaboration will build national research capability across the Australian innovation system to help industry investigate low-emission technologies to guide future demonstrations and industry development. There are great opportunities to initiate individual research projects based on the CERC Fellow’s interests. The CERC Fellow will be working at both the CSIRO site (Clayton, Melbourne, Australia) and Swinburne University of Technology labs (Hawthorn, Melbourne, Australia), with most of the sub-pilot plant work being at CSIRO. The successful applicant may need to travel to present research finding to the funding body, at conferences, or visit industry collaborators.

### Duties and Key Result Areas

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

* Carry out research in the project according to its research plan.
* Plan and execute relevant research work and data analyses, including modelling, survey and experimental study relevant to the project.
* Work towards broader project objectives; ensuring close liaison with supervisors
* Contribute to broader research activities and output of the Group with support and guidance, both individually and as a member of a team.
* Maintain a high-quality record of regular and original research publications of high international standing including peer reviewed journal papers.
* Present and demonstrate research results at project workshops, seminars and conferences.
* Coordinate projects, including the development of project plans, project completion and the implementation of project outcomes.
* Assist in the identification, negotiation and management of project resource requirements.
* Undertake research, analysis, report writing and publishing.
* Provide support, advice and co-supervision to postgraduate students, honours students and/or visiting students in the appointee's area of expertise.
  + Other duties as directed.

## **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/Engineering, Chemical Engineering, Metallurgical Engineering or related areas.
2. Ability to design and conduct independent research projects within a broader overall team environment, to identify complementary expertise and initiate appropriate collaborations, and to analyse the status of areas of technology from publications and patents.
3. A thorough knowledge of thermodynamic/kinetics modelling and hands-on experience in high temperature experimentations (kinetics and equilibrium).
4. Demonstrated high standard of interpersonal and communication skills including the ability to work both independently and collaboratively in a multi-disciplinary environment.
5. Proficient interpersonal and communication skills, including the ability to work within a diverse team.
6. High level of 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.
7. A sound history of publication in peer reviewed journals and/or authorship of scientific papers, reports, grant applications or patents.
8. A record of science innovation and creativity, including the ability & willingness to incorporate novel ideas and approaches into scientific investigations.

## **Desirable**

1. Hands-on experience with thermodynamic / thermochemical packages.
2. Hands on experience in using material characterization techniques such as XRD, SEM and other techniques.
3. Experience in furnace design and scale up of process.
4. Demonstrated capacity to supervise research postgraduate students.
5. Industrial experience in a process/metals industry.

## **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 as a CERC Fellow within CSIRO, candidates are 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 ($93,267). 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.
* 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/postdoctoral-fellowships).

## **About CSIRO**

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