# Position Description

## CSIRO Early Research Career (CERC) Postdoctoral Fellowship– CSOF4

The following information is for applicants

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| Advertised job title**:** | CSIRO Postdoctoral Fellowship in Geochemistry and Spectral Imaging – Red Sea and Mars |
| Job reference: | 61608 |
| Relocation assistance**:** | Will be provided to the successful candidate if required. |
| Applications are open to: | All Candidates |
| Percentage of client focus - internal: | 100% |
| Percentage of client focus - external: | 0% |
| Reports to the: | Sedimentary Basin Team Leader, Discovery Program |
| Number of direct reports: | 0 |
| How to apply: | Please apply online at [jobs.csiro.au](https://jobs.csiro.au/) and enter the requisition number**.** Internal applicants please apply via ‘Jobs Central’ through the ‘People Hub’ icon |
| Contact details to discuss this position: | Dr Anais Pages  Email : [Anais.pages@csiro.au](mailto:Anais.pages@csiro.au) |
| If you have difficulty applying please contact: | Call 1300 984 220 or email [csiro.online@csiro.au](mailto:careers.online@csiro.au) between 8.30 am and 5 pm Australian east coast time.  Please do not email your application directly to Anais Pages.   Applications received via this method will not be considered by the selection panel. |

## 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 or part time equivalent.**

**Project Overview:**

Despite an increasing demand in “green” metals such as Co and Mn that are crucial for the transition of the fossil fuel based energy sector to a sustainable, renewable energy future, robust exploration models for such commodities are yet to be developed. Improved understanding of the role of organic matter in metal transport and accumulation, in particular Zn, Co, Cu and Mn, will allow the development of novel mineral exploration models leading to more effective exploration.

The Red Sea, located at the spreading centre between two tectonic plates, the African Plate and the Arabian Plate, provides a unique opportunity to study metal-rich ores caught in the act of formation. At 2000 m depth in the Red Sea, the Atlantis II Deep is recognised as the largest modern-day ore-forming environment on Earth. It forms a 60-km long depression where hot metalliferous brines cause deposition of a thick Cu-Mn-Zn-Ag-rich sediment composed of a mixture of biologically- and hydrothermally-derived material. Although this style of mineralisation has been widely studied to inform genetic models for ancient ore deposits, the Red Sea is the only modern example of such mineralisation. The Red Sea also has important implications for planetary exploration and astrobiology.

Through this project, the Postdoctoral Fellow will develop an innovative interdisciplinary approach combining geochemistry, hyperspectral imaging and mineralogy to provide insight into ore formation processes of the Atlantis II Deep and refine current genetic models of ancient ore deposits. A highly detailed comparison of mineral properties from the Red Sea samples and the surface of Mars will also be conducted to gain further understanding of hydrothermal activity on Mars.

The project will be conducted in close collaboration with NASA Headquarters, the University of Honk Kong and the Australian Centre for Astrobiology at UNSW.

## Duties and Key Result Areas:

Under the direction of senior research scientists and engineers, CERC Postdoctoral Fellows:

* Carry out innovative, impactful research of strategic importance to CSIRO that will, where possible, lead to novel and important scientific outcomes.
* With support from the research team, lead the research project and maintain open communication with all stakeholders.
* Conduct a detailed geochemical and mineralogical characterisation of Red Sea sediments.
* Provide a spectral database of Red Sea samples.
* Review hyperspectral datasets from Mars and conduct comparison with newly produced datasets.
* Undertake regular reviews of relevant literature and patents.
* Produce high quality scientific papers suitable for publication in quality journals, for client reports and granting of patents.
* Prepare appropriate conference papers and present those at conferences as agreed with your supervisor.
  + 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.
  + 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 plans and policies, Diversity initiatives and Zero Harm goals.
* Other duties as directed.

**The CERC Postdoctoral Fellow learning and development program**is developed between the CERC Postdoctoral Fellow and their CSIRO supervisor. 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

<http://www.csiro.au/en/Careers/Student-and-graduate-programs/Postdoctoral-fellowships>

## CSIRO Competencies:

1. **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.**
2. **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.**
3. **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.**
4. **Judgement and Problem Solving:** Investigates underlying issues of complex and ill-defined problems and develops appropriate response by adapting/creating and testing alternative solutions.
5. **Independence: Recognise and makes immediate changes to improve performance (faster, better, lower cost, more efficiently, better quality, improved client satisfaction).**
6. **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:

*Under CSIRO policy only those who meet all selection criteria can be appointed.*

1. A doctorate (or will shortly satisfy the requirements of a PhD) in a relevant discipline area, such as Geochemistry (Organic, Isotopic and/or Inorganic), Mineralogy, Remote Sensing

***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. Demonstrated experience in geochemistry and mineralogy
2. Familiarity with at least three of the following techniques: state-of-the-art 2D and 3D imaging techniques (SEM, TEM, XRF mapping, computed micro-tomography) and spectral analysis (Raman Spectroscopy, Infrared (IR) microscopy)
3. Ability to interpret datasets obtained from remote and proximal sensing
4. **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**
5. **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.**
6. **A sound history of publication in peer reviewed journals and/or authorship of scientific papers, reports, grant applications or patents.**
7. A record of science innovation and creativity, including the ability & willingness to incorporate novel ideas and approaches into scientific investigations

## Desirable Criteria:

1. Experience working on the characterisation of clay minerals
2. Knowledge in ore deposit geology
3. Experience in organic geochemistry and/or organic matter-metal interactions
4. Knowledge and strong interest in planetary sciences and Astrobiology
5. Remain productive, positive and resilient in complex, ambiguous and/or uncertain environments.
6. **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.**

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*.* 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 security/national police/medical/character clearance requirements. Applicants who are not Australian Citizens or Permanent Residents 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 Postdoc 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.

CSIRO Early Research Career (CERC) Postdoctoral Fellow Experience Employee Value Proposition (EVP). Find out more! <https://www.csiro.au/en/careers/postdoctoral-fellowships>

## About CSIRO:

At CSIRO we solve the greatest challenges through innovative science and technology. See more [online](http://www.csiro.au/)!

Find out more about CSIRO [Mineral Resources](https://www.csiro.au/en/Research/MRF)