# Postdoctoral Fellowship – CSOF4

Role summary for potential applicants

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| Advertised Job Title**:** | CSIRO Postdoctoral Fellowship in Direct Ammonia Fuel Cells |
| Reference Number**:** | 58728 |
| Classification**:** | CSOF4 |
| Salary Range: | AU $82k to AU $93k plus up to 15.4% superannuation |
| Location**:** | Clayton South, Melbourne, Victoria |
| Tenure: | Specified Term of up to 3 years (or part time equivalent) |
| Relocation assistance**:** | Will be provided to the successful candidate if required |
| Applications are open to: | Australian Citizens Only  Australian/New Zealand Citizens and Australian Permanent Residents Only   * All Candidates |
| Functional Area**:** | Research Scientist / Engineer - Postdoc |
| % Client Focus - Internal: | 100% |
| % Client Focus - External: | 0% |
| Reports to the: | Senior Research Scientist |
| Number of Direct Reports: | 1 |

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| **Role Overview:** |
| **Postdoctoral Fellowships** at CSIRO provide opportunities to scientists and engineers who have completed their doctorate and have less than three years relevant postdoctoral work experience. These fellowships will help launch their careers, provide experience that will enhance their career prospects, and facilitate the recruitment and development of potential leaders for CSIRO.  Postdoctoral Fellows **are appointed for up to three years or part time equivalent** and 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 and at conferences.  The aim of the Postdoctoral Fellowship is to develop electrode and associated materials for solid oxide electrolyte based Direct Ammonia Fuel Cells to convert renewable ammonia directly into electricity without external cracking, and thus boost overall system efficiency. A successful outcome would greatly enhance the prospective role of ammonia as a vector for renewable energy by allowing conversion of ammonia back to electricity at the point of utilisation.  The key focus areas of the Postdoctoral Fellow’s work are to:  1. Understand fundamental reaction mechanism of ammonia splitting and electrochemical oxidation of hydrogen and modelling empirical relations between reaction kinetic parameters and catalyst properties.  2. Design new catalyst-electrode hybrid structures based on the crystal and surface structure of the materials and other related theoretical considerations and  3. Construct and evaluate Direct Ammonia Fuel Cells using newly developed electrodes and electrode catalysts in the high temperature fuel cell test stations. |

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| **Duties and Key Result Areas:** |
| * Under the direction of senior research scientists, carry out innovative, impactful research of strategic importance to CSIRO that will, where possible, lead to novel and important scientific outcomes. * Conduct comprehensive studies on the fundamental reaction mechanism/s of electrochemical ammonia oxidation in solid oxide fuel cells (SOFCs). * Design and synthesize new electrodes and electrode-catalysts for SOFCs, fabricate partial and complete cells, and test the cells using state of the art electrochemical and analytical techniques. * Conduct microstructural characterisation and cell post-mortem analysis to understand the mechanism of degradation phenomenon to improve cell materials performance. * Undertake regular reviews of relevant literature and patents. * Produce high quality scientific and/or engineering 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. * Contribute to the development of innovative concepts and ideas for further research. * Make a contribution to the effective functioning of the research team and help deliver CSIRO’s organisational objectives and plans. * Work collaboratively with colleagues within your team, the business unit and across CSIRO. * Communicate effectively and respectfully with all staff, clients and suppliers in the interests of good business practice, collaboration and enhancement of CSIRO’s reputation. * Adhere to the spirit and practice of CSIRO’s Values, Health, Safety and Environment plans and policies, Diversity initiatives and Zero Harm goals. * Undertake an appropriate training and development program developed by CSIRO. * Other duties as directed.   **CSIRO’s postdoctoral training program**is developed between the Postdoctoral Fellow and a CSIRO scientist or engineer. 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> |

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| **Selection Criteria:** |
| *Under CSIRO policy only those who meet all essential criteria can be appointed*  ***Pre-Requisites:***   1. **Education/Qualifications:** A doctorate (or will shortly satisfy the requirements of a PhD) in a relevant discipline area, such as Materials Science and Engineering, Ceramic Engineering, Electrochemical Engineering.   ***Please note:*** *To be eligible for this role you must have* ***no more than 3 years (or part time equivalent)*** *of relevant postdoctoral experience.*   1. **Communication: High level written and oral communication skills with the ability to represent the research team effectively internally and externally, including at national and international conferences.** 2. **Publications: A record of publications in quality, peer reviewed journals.** 3. **Behaviours:** A history of professional and respectful behaviours and attitudes in a collaborative environment.   ***Essential Criteria:***   1. Experience with solid oxide fuel cell (SOFC) materials processing and cell testing using various electrochemical techniques such as impedance spectroscopy, current-voltage characterisation and steady-state polarisation techniques along with related instrumentation. 2. Hands on experience with ceramics or inorganic catalyst synthesis using different synthesis routes such as sol-gel , solid state synthesis, wet impregnation and co-precipitation 3. Fundamental understanding of inorganic materials phase assemblage and evolution, and materials characterisation techniques such as SEM, TPR, XRD, TEM and BET as applied to phase studies. 4. Good understanding of supported metal catalysis related to oxidation or cracking of ammonia. 5. **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.** 6. A record of science innovation and creativity, plus the ability & willingness to incorporate novel ideas and approaches into scientific investigations.   **Desirable Criteria:**   1. Experience with software related to XRD data refinement and electrochemical impedance modelling. 2. Experience with gas chromatography and ammonia measurement techniques. 3. At least 2 to 3 years of experience in electrochemistry, fuel cells and/or materials engineering in academia (postgraduate studies acceptable) or related industry.   **As Australia’s Innovation Catalyst, CSIRO has strategic actions underpinned by behaviours aligned to**:   1. Excellent science 2. Inclusion, trust & respect 3. Health, safety & environment 4. Delivery on commitments.   **In your application and at interview you will need to demonstrate alignment with these behaviours.**  To be appointed as a 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 (AU$82,450).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/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> |

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| **Other Information:** |
| **How to Apply**  Please apply for this position online at <https://jobs.csiro.au/> and enter requisition number **58728**. Internal applicants please apply via ‘Jobs Central’ in SAP (click ‘Recruitment’)  Please load your CV (Maximum 2MB). You may also be required to respond to some screening questions.  If you experience difficulties applying online call 1300 984 220 for assistance. Outside Australian business hours please email: [csiro-careers@csiro.au](mailto:csiro-careers@csiro.au).  **Referees**: Please provide contact details of two previous supervisor or academic/professional referees in your resume/CV. We will ask your permission before making contact.  **Contact:** If after reading the position details above you require more information please contact:  **Dr Ani Kulkarni**via email: aniruddha.kulkarni@csiro.au or phone: **+61 3 95452832**  Please do not email your application directly to Dr Kulkarni. Applications received via this method may not be considered by the selection panel.  **About CSIRO**  Australia is founding its future on science and innovation. Its national science agency, the Commonwealth Scientific and Industrial Research Organisation (CSIRO) is a powerhouse of ideas, technologies and skills for building prosperity, growth, health and sustainability. It serves governments, industries, business and communities across the nation.  Find out more! [www.csiro.au](http://www.csiro.au).  We work flexibly at CSIRO, offering a range of options for how, when and where you work. Talk to us about how this role could be flexible for you.  Find out more! [CSIRO Balance](https://www.csiro.au/en/careers/the-csiro-experience/balance)  **CSIRO Energy** is pioneering low-emission technologies that create value for industry and households and provide the knowledge which will help guide Australia towards a smart, secure energy future. |