# Postdoctoral Fellowship - CSOF4

Role summary for potential applicants

|  |  |
| --- | --- |
| Advertised Job Title**:** | CSIRO Postdoctoral Fellowship in AI-driven Materials Discovery |
| Reference Number**:** | 46267 |
| Classification**:** | CSOF4 |
| Salary Range: | AU $80K to AU $91K plus up to 15.4% superannuation |
| Location**:** | Docklands, VIC |
| Tenure: | Specified Term of 3 years |
| Relocation assistance**:** | Will be provided to the successful candidate if required. |
| Applications are open to: | Australian Citizens Only  Australian Citizens and Permanent Residents Only   * All Candidates |
| Functional Area**:** | Research Scientist / Engineer - Postdoc |
| % Client Focus - Internal: | 90% |
| % Client Focus - External: | 10% |
| Reports to the: | Project Leader |
| Number of Direct Reports: | 0 |

|  |
| --- |
| **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** 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.  In this position you will develop new high-throughput simulation methods based on artificial intelligence to streamline the generation and curation of materials data; employ materials informatics (machine and deep learning) to explore complex molecular/materials structure/property relationships; use advanced visualisation methods to map functional properties to structure with sub-atomic resolution in real time, and collaborate with experimentalists and our industry partner. |

|  |
| --- |
| **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. * Develop and implement active learning and/or heuristic optimization algorithms in conjunction with commercial molecular and materials simulations software on high performance computers to automate and optimise computational materials design workflows. * Develop and/or use multivariate data analytics methods, such as machine and deep learning to predict structure/property relationships in the presence of structural polydispersivity and statistical uncertainty. * Design and implement real-time data monitoring and visualisation tools, drawing on state-of-the-art technologies such as virtual reality (VR). * Engage with the experimental collaborator to focus test cases toward industrially relevant outcomes. * 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. 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> |

|  |
| --- |
| **Selection Criteria:** |
| *Under CSIRO policy only those who meet all essential criteria can be appointed*  ***Pre-Requisites:***   * **Education/Qualifications:** A doctorate (attained or submitted for examination) in a relevant discipline area such as computer science, statistics, mathematics.   ***Please note:*** *To be eligible for this role you must have* ***no more than 3 years*** *of relevant postdoctoral experience.*   * **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.** * **Publications: A strong track record of publications in quality, peer reviewed journals.** * **Behaviours:** A history of professional and respectful behaviours and attitudes in a collaborative environment.   ***Essential Criteria:***   1. Extensive and detailed knowledge of, and demonstrated proficiency in, machine learning, deep learning and/or active learning. 2. Demonstrated proficiency in writing and maintaining user-friendly software, tools and scripts including scientific programming using Python. 3. Demonstrated experience in the use of high performance supercomputing environments, and the use of molecular and/or materials modelling software packages. 4. Demonstrated experience outputting scientific data to virtual reality devices. 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 and willingness to incorporate novel ideas and approaches into scientific investigations.   **Desirable Criteria:**   1. Experience molecular or materials modelling using commercial software packages. 2. Experience in cloud computing.   ***Other 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>  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 ($78,479).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.  ***CSIRO Values:***  As Australia’s Innovation Catalyst, CSIRO has strategic actions underpinned by behaviours aligned to Excellent science, Inclusion, trust & respect, Health, safety & environment and Deliver on commitments.  In your application and at interview you will need to demonstrate alignment with these behaviours.  ***Data61 Values:***  **Great Impact**: We focus our valuable resources on areas where we can lead globally and have large impact for Australia, to aid our future prosperity and independence.  **Mastery**: We are fearless, curious and we improve every day. We strive to excel in research, technology and business, and to work with the best in the world.  **Co-Creation of Value**: Everything we do involves co-creation with our network: team, customers and partners. Generously empowering their success is central to our success.  **Ownership of Results**: We jointly hold ourselves accountable for our actions. We do this via trust and commitment.  **People and their Differences**: We embrace the creativity that comes from the diversity of our people.  **Agility and Flexibility**: We view the changing world as an opportunity. This requires agility and flexibility in everything we do; everything changes, except our constant desire to adapt.  **Tell it Straight, with Respect:**We say what we mean, mean what we say, and do not mislead, obfuscate or spin. We're direct and always respectful. |

|  |
| --- |
| **Other Information:** |
| **How to Apply**  Please apply for this position online at [www.csiro.au/careers](http://www.csiro.au/careers).  **IMPORTANT:** When submitting your application you will to provide your CV and cover letter as one combined document. Your Cover Letter should outline your **motivation for applying**, and provide specific addresses to the **essential selection criteria 1, 2, 3 and 4** as outlined in this document. Any additional information relevant to the selection criteria will strengthen your application. The selection panel recommend that, where possible you should site references, repositories (eg. GIT Hub) and list methods and equipment that you have used.  Applicants who do not provide the requested information may not be considered.  Please **do not** upload academic transcripts or copies of your qualifications. Your application should not exceed 10 pages.  If you experience difficulties applying online call 1300 984 220 and someone will be able to assist you. Outside business hours please email: [csiro-careers@csiro.au](mailto:csiro-careers@csiro.au).  **Referees**: Please provide the names and contact details of two previous supervisors or academic/ professional referees in your resume/CV. We will ask your permission prior to contacting them.  **Contact:** If after reading the selection documentation you require further information please contact:  Dr Amanda Barnardvia email: [amanda.barnard@data61.csiro.au](mailto:amanda.barnard@data61.csiro.au)  Please do not email your application directly to Dr Barnard. Applications received via this method will not be considered.  **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).  **CSIRO Data61** In today’s data-focused world, there’s no doubt that numbers count. [**Data61**](http://www.data61.csiro.au/) are the largest data innovation group in Australia, a connector that brings together technology innovators, businesses and universities to transform Australian industry and to help solve our greatest challenges. A CSIRO business, we are creating our data-driven future.  **Our commitment to you** 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. We emphasise an individual’s growth and development which is supported by interacting and learning from world leading scientists and engineers, who provide the opportunity to challenge, transform and innovate new ideas.  CSIRO’s Data61 is committed to sourcing the brightest and best talent to become part of the Data61 family, which contributes to creating Australia’s data driven future.  **The Molecular & Materials Modelling laboratory** at Data61 is a unique environment. Populated by physicists, quantum chemists, data scientists and software programmers, it is place where new scientific ideas and discoveries can be implemented in user-friendly code that impact research around the world. Among the team is the highly awarded Dr Amanda Barnard, winner of the 2014 Feynman Prize (Theory), and the Physical Scientist of the Year from the Prime Minister of Australia in 2009 (among many other awards). The lab is located in downtown, the central business district of Melbourne, Australia’s second largest city. Melbourne is the cultural capital of Australia, boasting numerous festivals, international sporting events, a thriving nightlife and world class dining. This position offers the perfect combination of challenging science, a path to get your technology out into the global innovation system, and the life style options to achieve your ideal work/life balance. |