# Position Details

## Technical Services- CSOF4

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| The following information is for applicants |
| Advertised Job Title | High Performance Computing Research Software Engineer  |
| Job Reference | 79141 |
| Tenure | Specified Term of 3 years  Full-time  |
| Salary Range | AU$87,068 to AU$98,504 pa (pro-rata for part-time) + up to 15.4% superannuation |
| Location(s) | Clayton VIC, Eveleigh NSW, Canberra ACT, Adelaide SA, Brisbane QLD, Perth WA |
| Relocation Assistance | Will be provided to the successful candidate if required |
| Applications are open to | Australian Citizens Only |
| Position reports to the | Scientific Computing Services Team Lead (one of three)  |
| Client Focus – Internal | 100%  |
| Client Focus – External | 0%  |
| Number of Direct Reports | 0 |
| Enquire about this job | Mr Maciej Golebiewskivia email: Maciej.Golebiewski@csiro.au*Please do not email your application directly to Mr Golebiewski. Applications received via this method may not be considered by the selection panel.* |
| 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. |

### Role Overview

The role of Technical Staff in CSIRO is to provide support for scientific research in a diverse range of laboratory and field situations across a range of different research projects. This support consists of the application of accepted technical practices and the development of new practices. The work is usually carried out as a member of a centralised service.

The Scientific Computing Program (SC) is a significant part of IMT, comprising of approximately 90 technical specialists, split across two groups – SC Platforms and SC Services. SC is focused on delivering access to CSIRO’s computing and data facilities, as well as the associated computational and information management expertise, for all science and research carried out within CSIRO.

The SC Platforms group manages over 30PB of research data at a compounded annual growth rate of ~75%, and a proportionate computational and network fabric including High Performance Computing clusters and data stores, internal research cloud services and a highly versatile and robust corporate hosting platform.

The SC Services group offers expertise and capabilities in areas such as:

* Data Visualisation – visualisation and visual analysis of large and complex datasets.
* Data Analytics – including the use of statistical methods, machine learning and deep learning techniques.
* Computational techniques – such as scientific modelling, algorithmic development and software performance, scalability and parallelisation.
* Software Engineering – user requirements, agile software development, testing and validation.
* Cloud – use of cloud services and platforms in computational and data intensive projects including considerations of security and information assurance.
* Data handling - improving the management of valuable scientific and research data sets through data handling, discovery, use, and reuse.
* Sustainability - assistance with a project’s computational and data management needs to maximise reusability, publication and reproducibility.
* Workflow tools – construction/implementation of applications and user interfaces in defined workflow managements systems, providing mechanisms for data capture and computational provenance, as well as software reuse and portability.

The Scientific Computing Services group is offering an exciting opportunity for early career HPC Research Software Engineer to gain valuable practical experience within CSIRO and become part of teams solving and addressing real-world problems. The successful candidate will work on projects within teams of researchers, scientists and fellow technical experts, and assist with improving their scientific applications running on a variety of High-Performance Computing (HPC) platforms and environments. Specific projects will depend on researcher demand being matched to available expertise. A variety of specialist skills are sought, and it is expected that successful candidates will cover a subset of desired skills as well as demonstrate good aptitude, and desire and ability to learn.

This is an opportunity to work in a professional and technically challenging environment, supporting a diverse range of applications, to further the use of computation in science discovery.

### Duties and Key Result Areas:

* Under the guidance of senior team members, the main duties will include contributing to SCS activities with a focus on two or more of the following:
* High performance computing
* Software engineering support
* Workflow orchestration
* Numerical and data modelling
* Software choice and provision
* Resource and service orchestration.
* Data manipulation, analysis and interpretation (including geospatial data)
* Liaise with clients to determine their needs and take personal responsibility for their satisfaction, correct problems promptly and in a constructive manner.
* Under general direction, undertake a wide variety of tasks or tasks that have a high degree of technical difficulty, documenting procedures, and training clients in systems and processes.
* Participate in the planning of projects and accept responsibility for carrying out major parts of the project and make contributions to the interpretation and communication of results.
* Develop original techniques, processes, or software, especially when encountering unfamiliar problems where methods are not defined, and initiative is required to seek new approaches for improving the service provided and meet client needs.
* Communicate openly, effectively, and respectfully with all staff, clients and suppliers in the interests of good business practice, collaboration, and enhancement of CSIRO’s reputation.
* Work collaboratively as part of a multi-disciplinary, often regionally dispersed research team, and business unit to carry out tasks in support of CSIRO scientific objectives.
* Adhere to the spirit and practice of CSIRO’s Code of Conduct, Health, Safety and Environment procedures and policy, Diversity initiatives, and Making Safety Personal goals.
* Work responsibly and appropriately with personal, sensitive, and commercial-in-confidence information.
* Other duties as directed.

## **Required 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**

#### Prerequisite

1. Education/Qualifications: Tertiary degree in science, engineering, computer science, information technology or relevant field.
2. Communication: Excellent communication skills, both written and oral, including the ability to anticipate the interests and knowledge level of an audience and present information and feedback accordingly.
3. Problem Solving: The ability to quickly identify and characterize problems and to investigate, develop, recommend, and test potential solutions.

## **Essential**

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

1. Experience in developing and supporting software for two or more of the following
2. High Performance Scientific Applications - algorithm and program optimisation, parallelisation, power optimisation for large scale computations and pipeline optimisations
3. Workflows and Pipelines - dependency-based methods, streaming (data ingest, robust pipelines), workflow tools and frameworks, and batch job management on our HPC clusters
4. Research Software Engineering - user requirements gathering, agile software development, software and system testing and validation
5. Simulation and Modelling - Computational Fluid Dynamics, Finite Element Analysis and Complex Systems
6. Domain Specific Algorithms and Software – astronomy, bioinformatics, remote sensing and image and signal processing
7. Science Data Management – provenance, lifecycle management and data formats and interchange
8. Solution Design – cloud and HPC based solutions, storage, governance frameworks and reporting
9. Demonstrated experience in C++, Python, MPI or OpenMP and libraries for numerical computing, modelling and analytics.

## **Desirable:**

1. Demonstrated experience in one or more of the following languages: Fortran, C, R, MATLAB.
2. Demonstrated experience in developing software for GPUs.
3. Demonstrated experience of applying modern software engineering practices and tools, such as version control systems, build systems, testing, Agile development, profiling/debugging tools, and technical documentation.
4. Expertise in the use and design of data centric workflows. This may include including scripting, use of HPC batch systems, cloud/container computing, web-based interfaces/portals and visualisation, use/provision of web services, databases, ‘big data’ technologies and workflow tools.
5. Demonstrated experience in a science domain relevant to CSIRO.
6. Demonstrated experience with containerisation, including container design/definition, container orchestration, container networking and security, and Continuous Integration and Delivery workflow

Special Requirements

Appointment to this role may be subject to conditions including provision of a national police check as well as other security/medical/character clearance requirements.

* + - The successful candidate will be asked to obtain and provide evidence of a National Police Check or equivalent. Please note that people with criminal records are not automatically deemed ineligible. Each application will be considered on its merits.
		- The successful candidate will be required to obtain and maintain a security clearance at the baseline level (this effectively requires Australian Citizenship).

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