# Position Details

## Research Projects – CSOF6

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| The following information is for applicants | |
| Advertised Job Title | Senior Controls Software Engineer – SKA-Low Telescope |
| Job Reference | 87792 |
| Tenure | Indefinite  Full-time, Part-time, or Job-share |
| Salary Range | AU$117k - AU$138k pa (pro-rata for part-time) + up to 15.4% superannuation |
| Location(s) | Perth, Western Australia |
| Relocation Assistance | Will be provided to the successful candidate if required |
| Applications are open to | All Candidates  Visa sponsorship may not be available for part-time appointments |
| Position reports to the | SKA-Low Head of Computing & Software |
| Number of Direct Reports | 3 |
| Enquire about this job | Juan Carlos Guzman, [jc.guzman@skao.int](mailto:jc.guzman@skao.int) |
| 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).

**The CSIRO Experience**

As an employee of CSIRO, you will be eligible for the many benefits of working at Australia’s National Science Agency. You can read more here:

1. [Life at CSIRO](https://www.csiro.au/en/careers/life-at-csiro)
2. [Personal Development & Learning](https://www.csiro.au/en/careers/life-at-csiro/Career-development)
3. [Generous Leave & Conditions](https://www.csiro.au/en/careers/life-at-csiro/Generous-leave-conditions)
4. [Work / Life Balance](https://www.csiro.au/en/careers/life-at-csiro/Balance)

**Background**

The SKA Observatory (SKAO) is coordinating a global effort to build the largest science facility on the planet. This next-generation radio-astronomy observatory will transform our understanding of the Universe and deliver benefits to society through global collaboration and innovation.

SKAO is one observatory with two telescopes: SKA-Low in Western Australia and SKA-Mid in South Africa, with the global headquarters at Jodrell Bank, UK. The SKAO is an intergovernmental organisation composed of member states from four continents, with organisations from 16 countries in total currently participating in the project.

The SKAO’s science goals are broad and ambitious. Its telescopes will investigate the history of the Universe as far back as the Cosmic Dawn, when the very first stars and galaxies formed, to seek answers to some of the biggest questions in astronomy. The SKAO will use cutting-edge technology to enable transformational science, revolutionising our understanding of the Universe and delivering a major impact on society, in science and beyond.

In Australia, SKAO is collaborating with CSIRO to operate the SKA-Low Telescope, which will be built at CSIRO’s Murchison Radio-astronomy Observatory (MRO), on Wajarri Yamatji country. SKA-Low teams will operate out of our Engineering Operations Centre in Geraldton and Science Operations Centre in Perth.

The first phase of the SKA will consist of two telescopes:

* Australia will host the SKA’s low-frequency telescope (SKA1-Low). SKA-Low will comprise up to 131,072 antennas in clusters along spiral arms spanning 65 km at CSIRO’s Murchison Radio-astronomy Observatory (MRO) in Western Australia.
* South Africa will host the mid-frequency telescope (SKA-Mid). SKA-Mid will comprise up to 197 dishes spread along spiral arms spanning 150 km.

Further Reading: [SKA Phase 1 Key Documents.](https://www.skatelescope.org/key-documents/)

**Flexible Working (Balance)**

We value and respect difference and are committed to building an inclusive culture. We believe that you do your best at work when you have a work/life balance and create an environment where you can balance a successful career with your commitments and interests outside of work. Supporting flexibility is important to us: let us know in your application if you have any flexible working requests.

**Innovation through Diversity**

We believe that innovation thrives on the diversity of thought, ideas, and lived experiences being brought to the table by all to solve Australia’s greatest challenges. We are an Equal Opportunity employer working hard to recruit world-class talent that represents the diversity across our society, empowering staff to bring their whole selves to work and supporting everyone to enable their ideas to flourish. We recognise that a candidate's capability to perform a role can be demonstrated in a variety of ways and encourage candidates to address the role criteria with this in mind.

**Role Overview**

The Computing and Software team delivers novel computing and technology solutions to meet the requirements of the SKA Project (read more [here](https://www.skatelescope.org/software-and-computing/)). The SKA Observatory is driven by software and the systems include:

* An integrated control system that controls and monitors over 2 million process variables.
* Data processing systems that process the vast quantities of data produced by the SKA Low, which will require a high-performance supercomputer capable of more than 100 petaflops and will result in hundreds of Petabytes of data archived per year.
* Science management systems to manage the interaction with scientists from around the world and ensure the huge amounts of data are made available to the appropriate people in a timely manner.
* Networks that move the data at rates exceeding Tbits/second across hundreds of km within the telescope and then shipping it to the scientific community using a world-wide 100 Gbit network.

The Senior Controls Software Engineer – SKA-Low, provides technical leadership to the team supporting the development and operations of the control software of the SKA-Low telescope.  The position works alongside the SKAO’s Controls Architect, and the teams around the world developing the control and monitoring software in the telescope’s construction phase. The construction adheres to large scale agile principles, using an SKA tailored version of the Scaled Agile Framework (SAFe), and the new role will work within this framework as it evolves from construction to operations. The SKA Telescope monitoring and control systems are based on the Tango Control System Framework (<https://www.tango-controls.org/>) and the candidate will be expected to acquire a deep knowledge of this Framework and provide technical leadership as to its use in the SKA Low telescope.

Due to the locations involved in the SKA Project, in particular South Africa and the United Kingdom, this role will require some work outside normal hours. It will involve domestic travel to the Murchison Radio-astronomy Observatory and Geraldton and occasional international travel. CSIRO offers a range of flexible options for how, when and where you work including a blend of work from home and from the office, noting this role is based in Perth, Western Australia.

**Duties and Key Result Areas**

* Work with stakeholders to continually refine control system requirements for the SKA telescopes to ensure they meet the system requirements in an appropriate and cost-effective manner.
* Take part in the activities of the Observation Monitoring and Control Agile Release Train (OMC ART) as required by the SKA Project SAFe implementation and its evolution through construction and operations.
* Support the software development, deployment, maintenance and operations activities of the telescope and observatory control systems with particular attention to DevOps practices. Initially, this may involve working on, and/or supporting, one of the Construction development teams.
* Be an integral member of an international software team.
* Be a technical leader for the local controls engineering team.
* Communicate openly, effectively, and respectfully with all staff, clients and suppliers in the interests of good business practice, collaboration and enhancement of SKAO and CSIRO’s reputation.
* Adhere to the spirit and practice of both SKAO and CSIRO’s Values as well as the Code of Conduct, Health, Safety and Environment procedures and policy, Diversity initiatives and Zero Harm goals.
* Other duties as directed.

**Selection Criteria**

#### Essential

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

1. Have excellent skills in C++ and/or Python software development in a GNU/Linux environment. The candidate is encouraged to provide evidence in the form of publicly available code where possible.
2. Demonstrate technical expertise in at least one of the following control software systems:
   * The Tango Control system, or
   * A comparable system that can be demonstrated to have similar characteristics.
3. Understand the software development life cycle, based on common code versioning tools like Git, with particular attention to quality aspects, testing and configuration management.
4. Have excellent communication and influencing skills with distributed, highly specialised project teams and stakeholders, across international and diverse cultural backgrounds.
5. Experience in technical and/or team leader positions, or evidence of potential to fulfil such leadership positions, promoting diversity and developing an inclusive, high-performing culture.

**Desirable**

1. Demonstrate understanding and willingness to work based on lean/agile principles adopting DevOps practices.
2. Have a working knowledge of virtualisation and containerisation technologies.
3. Have experience in contributing to large open-source projects.
4. Demonstrate interest in astronomy and understanding of the challenges of controlling telescopes similar to SKA.

**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 team as well as industry colleagues.
* **Influence and Communication:** Identifies critical stakeholders and influences them via an influential third party, for example through an established network, to gain support for sometimes contentious, proposals / ideas.
* **Resource Management/Leadership:** Sets up and maintains effective and efficient work teams and manages performance and resources, to achieve objectives. Chooses appropriate management strategies and communication styles to maintain high levels of motivation and productivity. Gives feedback for development purposes and provides support and direction for improvement.
* **Judgement and Problem Solving:** Anticipates and manages problems in ambiguous situations. Develops and selects an appropriate course of action and provides for contingencies. Evaluates, interprets and integrates complex bodies of information and draws logical conclusions, synthesises proposals and defends options with reasoned arguments.
* **Independence:** Assesses the risk and opportunity of identified strategies, options and actions. Overcomes problems and setbacks in achieving goals. Invariably includes consideration of value-added future impact on bottom line when determining the optimal and efficient use of resources.
* **Adaptability:**Demonstrates flexibility in thinking and adapts to and manages the increasing rate of organisational change by adjusting strategies, goals and priorities.

**About CSIRO and SKAO Values**

Visit [CSIRO Online](http://www.csiro.au/) and [Space and Astronomy](https://www.csiro.au/en/Research/Astronomy) and [SKAO online](https://www.skaobservatory.org/) and [SKAO Location](https://research.csiro.au/ska/location/) for more information.  In your application and at interview you will need to demonstrate behaviours aligned to our values of:

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| **CSIRO** | **SKA Observatory** |
| * People First * Further Together * Making it Real * Trusted | * Diversity and Inclusion * Excellence * Collaboration * Creativity and Innovation * Sustainability |

**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 Clearance or equivalent. 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/)