Australian National University

Position Description

College/Division:	Research and Innovation
Department/Unit:	ACCESS National Research Infrastructure (NRI)
Position Title:	Senior Research Software Engineer
Classification:	ANU Officer Grade 8 (Specialist)
Position No:	TBC
Responsible to:	Team Leader
Number of positions that report to this role:	N/A
Delegation(s) Assigned:	N/A

PURPOSE STATEMENT:

ACCESS – The Australian Community Climate and Earth System Simulator – is a collaborative venture between Government and the Australian research community to support development, maintenance and access to climate and weather models and data. ACCESS is being transformed into a national research infrastructure capability accessible by a broader community of users, enabled by Australian Government investment through the National Collaborative Research Infrastructure Strategy (NCRIS). Hosted at ANU, ACCESS-NRI (ACCESS National Research Infrastructure) is established as a multi-party collaborative venture responding to the current and future needs of Australia's scientific, Government and stakeholder community.

The Senior Research Software Engineer will provide technical expertise to support ACCESS-NRI's computational and scientific software development within a team of software developers. The successful candidate will contribute and/or lead development, optimisation, and deployment of software and workflows that enable climate and Earth system modelling, utilising high-performance computing, visualisation and big-data approaches for the benefit of the Australian research community.

KEY ACCOUNTABILITY AREAS:

Position Dimension & Relationships:

ACCESS-NRI is led by a Director, who will play a national and international role in promotion of the ACCESS modelling capability, contribute to the wider development of climate, Earth system and weather modelling in Australia and provide technical and strategic leadership. There are two Associate Directors within the ACCESS-NRI facility (Associate Director, Model Development and Associate Director, Release Management) and 9 Team Leaders in Atmosphere, Ocean, Land, Ice Sheet, Coastal, Model Evaluation and Diagnostics, User Training, Software Transformation and Release Management.

The Senior Research Software Engineer will operate in one of these ACCESS-NRI teams, reporting to their team lead. The Senior Research Software Engineer will be expected to work collegially, leading by example to develop and maintain effective, productive and beneficial workplace relationships with colleagues, as well as with industry stakeholders.

Role Statement:

Under broad direction, working with a degree of autonomy, the Senior Research Software Engineer focuses on requirements analysis, development and evaluation of climate and Earth system modelling software and data, while considering the operational, cost and schedule, performance, training and support constraints.

The Senior Research Software Engineer will:

- Manage software development projects in climate and Earth system modelling from concept through to implementation and be responsible for the subsequent evaluation and testing.
- Develop and assess software system requirements, interfaces and specifications.
- Manage the design, development and technical processes of code repositories hosted by ACCESS-NRI.

- Manage the performance optimisation and evaluation of ACCESS-NRI software.
- Provide advice and technical support through the investigation, resolution and tracking of software.
- Contribute to the development of plans and schedules for assigned project tasks, ensuring technical requirements are met and risks are mitigated whilst ensuring that systems are delivered on schedule.
- Contribute to new project proposals, applying software engineering knowledge to develop work plans.
- Train and mentor other members of the team, research students and staff across the ACCESS community in numerical and computational techniques.
- Maintain a working knowledge both of best-practice procedures in the context of software development, and an awareness of relevant state-of-the-art technologies that might be applied to climate and Earth system modelling.
- Create and maintain technical documentation of software development by ACCESS-NRI and contribute to the preparation of articles for publication.
- Comply with, maintain an awareness of and help promote all ANU policies and procedures and in particular those relating to work health and safety and equal opportunity, including a demonstrated high level of understanding of equal opportunity best practice and a commitment to their application in a university context.
- Perform other duties as requested, consistent with the classification level of the position.

SELECTION CRITERIA:

1. Progress towards postgraduate qualifications in Computer Science, Climate Science or related disciplines, and/or significant experience in scientific software.
2. Demonstrated experience working with scientific programming languages, scripting languages and knowledge of common data formats.
3. Experience in weather, climate or Earth system modelling, or other relevant scientific modelling, including high performance/parallel computing and code management.
4. Demonstrated effective communication and liaison skills, with demonstrated experience in gathering requirements and building software to meet user needs.
5. Demonstrated ability to provide high-level technical advice and support to researchers and industrial stakeholders.
6. Demonstrated experience in working independently with minimal supervision, with an ability to understand code written by others quickly and self-sufficiently.
7. Demonstrated ability to work effectively and harmoniously as part of a team as well as excellent interpersonal and communication skills to relate effectively and provide guidance to a wide range of people.
8. A demonstrated understanding of equal opportunity principles and policies and a commitment to their application in a university context.

The ANU conducts background checks on potential employees, and employment in this position is conditional on satisfactory results in accordance with the Background Checking Procedure which sets out the types of checks required by each type of position.

Supervisor/Delegate Name:	Andy Hogg	**Date:**	April 2024

References:
General Staff Classification Descriptors
Academic Minimum Standards

Australian National University

Position Description

College/Division:	Research and Innovation
Department/Unit:	ACCESS National Research Infrastructure (NRI)
Position Title:	Principal Research Software Engineer
Classification:	Senior Manager 1 (Specialist)
Responsible to:	Team Leader
Number of positions that report to this role:	Nil
Delegation(s) Assigned:	Nil

PURPOSE STATEMENT:

ACCESS – The Australian Community Climate and Earth-Systems Simulator – is a collaborative venture between Government agencies and the Australian research community to support development, maintenance and access to climate and weather models. ACCESS is being transformed into a national research infrastructure capability accessible by a broader community of users, enabled by Australian Government investment through the National Collaborative Research Infrastructure Strategy (NCRIS). Hosted at ANU, ACCESS-NRI (ACCESS National Research Infrastructure) is being established as a multi-party collaborative venture responding to the current and future needs of Australia's scientific, Government and stakeholder community.

The Principal Research Software Engineer will provide advanced technical expertise to support ACCESS-NRI's computation and scientific software development within a team of software developers. The successful candidate will lead development, optimisation, and deployment of software and workflows that enable climate and Earth system modelling, utilising high-performance computing, visualisation and big-data approaches for the benefit of the Australian research community.

This position provides a rare opportunity to work in a massively parallel high-performance scientific computing and big-data environment, applied to addressing some of the biggest challenges the world will face in the near future. The appointee will both contribute to and benefit from the expertise and support of the ACCESS community. ACCESS-NRI provides a supportive and enriching workplace for its staff and students through its strong commitment to equity, diversity and inclusion and wellbeing initiatives. Candidates that will add to the diversity of the ACCESS community are especially encouraged to apply.

KEY ACCOUNTABILITY AREAS:

Position Dimension & Relationships:

ACCESS-NRI is led by a Director, who plays a national and international role in promotion of the ACCESS modelling capability, contributes to the wider development of climate, Earth system and weather modelling in Australia, and provides technical and strategic leadership. There are two Associate Directors within the ACCESS- NRI facility, Associate Director Model Development and Associate Director, Release Management.

The position of Principal Research Software Engineer will operate in one of the ACCESS-NRI teamsand lead the development, optimisation and deployment of ACCESS software and data. In undertaking their work, the incumbent will work/liaise with other members of the NRI facility and report to their Team Leader.

Role Statement:

Under the broad direction of theirTeam Leader, the Principal Research Software Engineer will: Be involved in transdisciplinary projects relevant to the Co-Lab partnership, providing a human information bridge between stakeholders and different projects.

1. Take a leadership role in providing a high-quality research infrastructure facility for the users of ACCESS-NRI's climate, Earth system and weather modelling, including engaging with the other modelling groups within the NRI.
2. Lead the activities for the technical development of ACCESS model software, including development of new techniques, computer architecture and algorithms, relevant documentation on these techniques as both user material and specialised training.
3. Develop, optimise and maintain ACCESS model code publishing and repositories that are integrated with national and relevant international computing environments. This includes metadata management, code

and data formats, version control, unique identifiers, access controls through authorisation policies, license management, and model and data management plans.
4. Liaise with the National Computational Infrastructure (NCI) to maintain and enhance the availability and usability of ACCESS model infrastructure.
5. Manage the development of user communication for the ACCESS-NRI Software Development and new techniques, including web, other electronic forums, workshops and training.
6. Lead development of new software, analysis and programming techniques that increase the ACCESS modelling capability on emerging high-performance computing environments.
7. Contribute to leadership within the ACCESS Model Development and Release Management portfolios through direct engagement with stakeholder organisations and supervision, mentoring and guidance of staff within the team.
8. Maintain currency with advances in relevant Earth systems model technology, data, tools and new software techniques, through literature, conferences, international working groups, and other means.
9. Perform other duties, appropriate to this classification, as directed.
10. Comply with all ANU policies and procedures, and in particular those relating to work health and safety and equal opportunity.

SELECTION CRITERIA:

1. Completion or progress towards postgraduate qualifications in a relevant field of science or software engineering with experience in a software or data specialist role.
2. Extensive experience working with scientific programming languages, scripting languages and knowledge of common data formats, including new scientific software techniques, such as machine learning, cloud-based computing or GPU-based methods, and how they can be applied to a wide spectrum of multi-disciplinary science.
3. Advanced knowledge of tools and techniques for working with large multidimensional climate and/or geoscience data in HPC and cloud environments.
4. Demonstrated capability in model architecture and software, including code development, code repository management, porting and compiling models, and optimising code on parallel high-performance computing systems.
5. Demonstrated experience in supporting a high-quality service to users, including analysing problems and resolving problems related to scientific requirements, monitoring the status of services, proactively seeking service improvements to meet emerging areas of need.
6. Proven experience in working effectively and harmoniously to achieve high quality outcomes, and excellent interpersonal and communication skills to relate effectively and provide guidance to a wide range of people.
7. A demonstrated high-level understanding of equal opportunity principles and a commitment to the application of EO policies in a university context.

The ANU conducts background checks on potential employees, and employment in this position is conditional on satisfactory results in accordance with the Background Checking Procedure which sets out the types of checks required by each type of position.

Supervisor/Delegate Signature:		**Date:**	
Printed Name:		**Uni ID:**	

References:

Professional Staff Classification Descriptors

Australian National University

Pre-Employment Work Environment Report

Position Details

College/Div/Centre	RII	**Dept/School/Section**	ACCESS-NRI
Position Title	Principal Research Software Engineer	**Classification**	ANU SM1
Position No.		**Reference No.**	

In accordance with the Work Health and Safety Act 2011 (Cth) the University has a primary duty of care, so far as reasonably practicable, to ensure the health and safety of all staff while they are at work in the University.

- This form must be completed by the supervisor of the advertised position and appended to the back of the Position Description.
- This form is used to advise potential applicants of work environment and health and safety hazards prior to application.
- Once an applicant has been selected for the position they must familiarise themselves with the University WHS Management System via Handbook guidance https://services.anu.edu.au/human-resources/health-safety/whs-management-system-handbook
- The hazards identified below are of generic nature in relation to the position. It is not correlated directly to training required for the specific staff to be engaged. Identification of individual WHS training needs must be in accordance with WHS Local Training Plan and through the WHS induction programs and Performance Development Review Process.
- 'Regular' hazards identified below must be listed as 'Essential' in the Selection Criteria - see ' Employment Medical Procedures' at http://info.anu.edu.au/Policies/_DHR/Procedures/Employment_Medical_Procedures.asp

Potential Hazards

- Please indicate whether the duties associated with appointment will result in exposure to any of the following potential hazards, either as a **regular** or **occasional** part of the duties.

TASK	regular	occasional	TASK	regular	occasional
key boarding	☒	☐	laboratory work	☐	☐
lifting, manual handling	☐	☐	work at heights	☐	☐
repetitive manual tasks	☐	☐	work in confined spaces	☐	☐
Organizing events	☐	☐	noise / vibration	☐	☐
fieldwork & travel	☐	☐	electricity	☐	☐
driving a vehicle	☐	☐			
NON-IONIZING RADIATION			**IONIZING RADIATION**		
solar	☐	☐	gamma, x-rays	☐	☐
ultraviolet	☐	☐	beta particles	☐	☐
infra red	☐	☐	nuclear particles	☐	☐
laser	☐	☐			
radio frequency	☐	☐			
CHEMICALS			**BIOLOGICAL MATERIALS**		
hazardous substances	☐	☐	microbiological materials	☐	☐
allergens	☐	☐	potential biological allergens	☐	☐
cytotoxics	☐	☐	laboratory animals or insects	☐	☐
mutagens/teratogens/ carcinogens	☐	☐	clinical specimens, including blood	☐	☐
pesticides / herbicides	☐	☐	genetically-manipulated specimens	☐	☐
			immunisations	☐	☐

OTHER POTENTIAL HAZARDS (please specify):

Supervisor/Delegate Name:	*Andy Hogg*	**Date:**	***29/0824***