



**Australian
National
University**

Position Description

College/Division:	ANU College of Science
Faculty/School/Centre:	Research School of Earth Sciences
Department/Unit:	Seismology & Mathematical Geophysics
Position Title:	Scientific Programmer
Classification:	ANU Officer Grade 7 (Research)
Position No:	
Responsible to:	Prof. Malcolm Sambridge
Number of positions that report to this role:	
Delegation(s) Assigned:	

PURPOSE STATEMENT:

The ANU College of Science (CoS) comprises: the Research School of Astronomy and Astrophysics, the Research School of Biology, the Research School of Chemistry, the Research School of Earth Science, the Fenner School of Environment and Society, the Mathematical Sciences Institute, the Research School of Physics, and the Centre for the Public Awareness of Science. Staff and students within the ANU College of Science conduct research and deliver a research-led education program that encompasses the entire breadth of the sciences, supported by extensive international networks and by world-class facilities. The College has a strong tradition of research excellence that has fostered distinguished Nobel Laureates and Kyoto Prize winners and that trains scientific leaders in disciplines in which the ANU is consistently ranked in the top twenty in the world.

The Research School of Earth Sciences is a leading centre of geoscience research in Australia, and its Seismology and Mathematical Geophysics group is world-renowned. The group comprises around a dozen members of academic staff, 20 PhD students, and numerous technical specialists, and is exceptionally well-resourced. We run an extensive seismological field programme, with regular deployments throughout the Australian continent, operate the Australian Seismometers in Schools network (AuSIS), and manage the Warramunga seismic array on behalf of the Australian Government and CTBTO. We also have access to excellent computational facilities including our own cluster, TerraWulf III, and the Australian national supercomputer, Gadi, which is located on the ANU campus. The group has long-standing links with leading research institutes across Australia and worldwide, including active partnerships with Geoscience Australia and CSIRO.

Position Dimension & Relationships:

In collaboration with Prof. Malcolm Sambridge, the Scientific Programmer will lead the technical development of CoFI, the Common Framework for Inference. This will include liaison with a range of stakeholders in academia and industry to understand potential use-cases and requirements, development and documentation of the API specification itself, and creation of a reference implementation encompassing a variety of standard inference algorithms and problems. Depending on the appointee's interests and expertise, there may also be opportunities to participate in educational and outreach activities (e.g. workshops with potential end-users) and to contribute directly to our ongoing research programmes.

Role Statement:

Under broad direction the Scientific Programmer will:

1. Provide technical support for computationally oriented research
2. Develop software and workflows to assist staff and students from RSES to efficiently build, validate, run and analyse computational models
3. Lead the technical development of the Common Framework for Inference (CoFI), including develop, support and document an appropriate specification for the API together with integration into existing codes.
4. Liaise with a range of stakeholders in academia and industry to understand end-user requirements and support CoFI.
5. Assist in training researchers and research students in numerical and computational approaches

6. Perform other duties as requested, consistent with the classification level of the position and in line with the principle of multi-skilling.
7. Comply with all ANU policies and procedures, in particular those relating to work health and safety and equal opportunity

SELECTION CRITERIA:

1. Degree with relevant experience in physics, mathematics, computer science, engineering, Earth sciences or a related area or extensive experience, at least four years, in software development in a scientific environment or an equivalent combination of relevant experience and education/training.
2. Demonstrated experience working with at least two scientific programming languages (e.g. Fortran, C, Python), code optimisation, documentation, scripting, advanced visualisation techniques, high performance computing environments (e.g. Tensorflow, PyTorch), distributed software development (github) and parallel programming (MPI) or GPU.
3. An understanding of the physical basis of solid Earth models and demonstrated ability to solve physical problems using numerical algorithms
4. Ability to work under broad direction within established deadlines and as part of a team
5. Strong oral presentation and interpersonal communication skills, which are required to interface with diverse and heterogeneous teams of scientists
6. A demonstrated understanding of equal opportunity principles and policies and a commitment to their application in a university context.

Background Checking:

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:	6 May 2021
Printed Name:	Professor Malcolm Sambridge	Uni ID:	U8414462

References:

[General Staff Classification Descriptors](#)



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Pre-Employment Work Environment Report

Position Details

College/Div/Centre	College of Science	Dept/School/Section	RSES / Seismology & Mathematical Geophysics
Position Title	Scientific Programmer	Classification	ANU Officer 7 (Research)
Position No.		Reference No.	

In accordance with the Occupational Health and Safety Act 1991 the University has a duty of care to provide a safe workplace for all staff.

- This form must be completed by the supervisor of the advertised position and forwarded with the job requisition to Appointments and Promotions Branch, Human Resources Division. Without this form jobs cannot be advertised.
- This form is used to advise potential applicants of work environment issues prior to application.
- Once an applicant has been selected for the position consideration should be given to their inclusion on the University's Health Surveillance Program where appropriate – see . http://info.anu.edu.au/hr/OHS/_Health_Surveillance_Program/index.asp
Enrolment on relevant OHS training courses should also be arranged – see http://info.anu.edu.au/hr/Training_and_Development/OHS_Training/index.asp
- '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	☐	☐
catering / food preparation	☐	☐	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's Signature:		Print Name:	Malcolm Sambridge	Date:	6 May 2021
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