

POSITION DESCRIPTION

Position Title: Computational Geoscientist
Organisation Unit: School of Earth and Environmental Sciences
Position Number:
Type of Employment: Full time, Fixed Term until 30 June 2018 (with possible extension pending funding)
Classification: Academic Level A

THE UNIVERSITY OF QUEENSLAND

The University of Queensland (UQ) contributes positively to society by engaging in the creation, preservation, transfer and application of knowledge. UQ helps shape the future by bringing together and developing leaders in their fields to inspire the next generation and to advance ideas that benefit the world. UQ strives for the personal and professional success of its students, staff and alumni. For more than a century, we have educated and worked with outstanding people to deliver knowledge leadership for a better world.

UQ ranks in the world’s top universities, as measured by several key independent ranking, including the Performance Ranking of Scientific Papers for World Universities (43), the US News Best Global Universities Rankings (52), QS World University Rankings (47), Academic Ranking of World Universities (55), and the Times Higher Education World University Rankings (60). UQ again topped the nation in the prestigious Nature Index and our Life Sciences subject field ranking in the Academic Ranking of World Universities was the highest in Australia at 20.

UQ has an outstanding reputation for the quality of its teachers, its educational programs and employment outcomes for its students. Our students remain at the heart of what we do. The UQ experience – the UQ Advantage – is distinguished by a research enriched curriculum, international collaborations, industry engagement and opportunities that nurture and develop future leaders. UQ has a strong focus on teaching excellence, winning more national teaching excellence awards than any other in the country and attracting the majority of Queensland’s highest academic achievers, as well as top interstate and overseas students.

UQ is one of Australia’s Group of Eight, a charter member of edX and a founding member of Universitas 21, an international consortium of leading research-intensive universities.

Our 50,000-plus strong student community includes more than 13,000 postgraduate scholars and more than 12,000 international students from 144 countries, adding to its proud 240,000-plus alumni. The University has about 7,000 academic and professional staff and a $1.8 billion annual operating budget. Its major campuses are at St Lucia, Gatton and Herston, in addition to teaching and research sites around Queensland and Brisbane city. The University has six Faculties and four University-level Institutes. The Institutes, funded by government and industry grants, philanthropy and commercialisation activities, have built
scale and focus in research areas in neuroscience, biomolecular and biomedical sciences, sustainable minerals, bioengineering and nanotechnology, as well as social science research.

UQ has an outstanding track-record in commercialisation of our innovation with major technologies employed across the globe and integral to gross product sales of $11billion+ (see http://uniquest.com.au/our-track-record).

UQ has a rapidly growing record of attracting philanthropic support for its activities and this will be a strategic focus going forward.

Organisational Environment

The School of Earth and Environmental Sciences is a vibrant, multidisciplinary School with extensive teaching and research programs covering the fields of Geology, Geography, Environmental Management, Occupational Health and Safety Sciences and Planning. The School offers a wide range of undergraduate programs including Bachelor's degrees in Arts (Geography) and Science (Geological and Geographical Science), a Bachelor of Environmental Management and Environmental Science, Occupational Health and Safety Science and a Bachelor of Regional and Town Planning. Honours in Geology, Geography, Geophysics, and Computational Earth Sciences. Coursework masters degrees are offered in Mineral Resources, Environmental Management, Geographic Information Science, Occupational Health and Safety Science and Urban and Regional Planning and the School also contributes to the multi-school Master of Development Practice. The School offers postgraduate training in research via the Master of Philosophy and Doctor of Philosophy and currently has over 150 students enrolled in these degrees. The School has a strong research profile and enjoys an excellent success rate in nationally competitive grants and has a strong record of high quality publications.

Staff and Resources

The School of Earth and Environmental Sciences is part of the Faculty of Science and is located on the St Lucia campus (Brisbane) of the University. The School has 104 academic staff, and 23 administrative and technical staff. There is a large contingent of research appointments and the School has been active in establishing a range of adjunct positions in order to promote engagement with leaders in government and the professions.

The School hosts world-class facilities which include a state-of-art planning studio, GIS computer laboratories and extensive analytical infrastructure. Our facilities include high-end sample preparation facilities and a laboratory complex that includes radiogenic and stable isotopes, major and trace element geochemistry, noble gas geochemistry and geochronology, coal petrology and organic geochemistry, geomicrobiology and fluid inclusion facilities. Its Centre for Geoscience Computing conducts research on the mechanics and physics of solid earth processes, on all scales, using supercomputer simulation. Advanced computational technologies and simulation software development are applied to a wide range of industrial and environmental fields and provide a driver for innovation in the general area of simulation-assisted design, specifically in the sustainable energy, earth resources, mass mining and geotechnical sectors. Further information and details of the research interests of academic staff may be accessed on the School’s web site at http://www.sees.uq.edu.au/.
DUTY STATEMENT

Primary Purpose of Position

The primary role of the selected candidate will be to engage as a Computational Geoscientist within the School of Earth and Environmental Sciences to enhance and support software infrastructure for large-scale geophysical data inversion within the NCRIS Simulation Analysis and Modeling Infrastructure Project for Australian Earth and Geospatial Science, see http://www.auscope.org.au/.

Objectives of the project includes:

- Development of scalable solution methods for large-scale, three-dimensional, geophysical inversion problems using parallel supercomputers,
- Efficient implementation of numerical schemes to solve relevant partial differential equations using parallel computers provided as part of Australia's high-performance supercomputer infrastructure,
- Delivery of state-of-the-art software components for large-scale inversion and numerical simulations to the geoscience community in Australia and overseas.

Duties

Duties and responsibilities include, but are not limited to:

Research

- Develop scalable solution methods for large-scale geophysical inversion in 3D.
- Apply geophysical inversion to field data in collaboration with scientists in Australia and overseas.
- Prepare scientific papers and project reports.
- Make presentations to team members and the research community.
- Develop research proposals for emerging grant opportunities.
- Develop effective timelines and milestones based on goals of the project.
- Communicate efficiently with other team members, students, and your supervisor.
- Attend School based meetings and Seminars.

Service and Engagement

- Foster the School's relations with industry, government departments, professional bodies and the wider community.
- Any other duties as reasonably directed by your supervisor

Other

Ensure you are aware of and comply with legislation and University policy relevant to the duties undertaken, including but not exclusive to:

- the University's Code of Conduct
• requirements of the Queensland occupational health and safety (OH&S) legislation and related OH&S responsibilities and procedures developed by the University or Institute/School
• the adoption of sustainable practices in all work activities and compliance with associated legislation and related University sustainability responsibilities and procedures
• requirements of the Education Services for Overseas Students Act 2000, the National Code 2007 and associated legislation, and related responsibilities and procedures developed by the University

Organisational Relationships

The position reports to Associate Professor Lutz Gross.

SELECTION CRITERIA

Essential

• PhD in the area of geophysics, applied mathematics or scientific computing.
• Theoretic and applied research experiences in geophysical data inversion.
• Track record of publications in the field of geophysical data inversion.
• Demonstrated knowledge in numerical methods for scientific computing.
• Demonstrated experience in programming in python.
• Demonstrated ability to work collaboratively in a multi-disciplinary research team.

Desirable

• Demonstrated experience in programming in C++, OpenMP and MPI.
• Demonstrated experience in agile software development
• Comprehensive knowledge of using parallel computers to solve complex computational science problems
• Track record of developing research proposals in the area of geophysics

An appointment to this position is subject to the verification of the highest academic qualification from the conferring institution

The University of Queensland values diversity and inclusion and actively encourages applications from those who bring diversity to the University. Please refer to the University’s Diversity and Inclusion webpage (http://www.uq.edu.au/equity) for further information and points of contact if you require additional support.

This role is a full-time position; however flexible working arrangements may be negotiated.

Accessibility requirements and/or adjustments can be directed to the contact person listed in the job advertisement.