POSITION DESCRIPTION

Position Title: Research Fellow
Organisation Unit: ARC Centre of Excellence for Engineered Quantum Systems (EQUS)
Position Number: New
Type of Employment: 100% Fixed Term 1 July 2018 to 31 Dec 2019
Classification: Research 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 (65). 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 Australian Research Council Centre of Excellence for Engineered Quantum Systems (EQUS) is a major Australian national research centre established in 2011, bringing together researchers from The University of Queensland, The University of Sydney, Macquarie University, The University of Western Australia, and The Australian National University. The Centre also collaborates with international and national research institutes. There are a number of domestic and international partner institutions.

The ARC Centre of Excellence in Engineered Quantum Systems (EQUS) will develop quantum technologies for the future health, economy, environment and security of Australian society. We will move beyond the lab towards practical prototypes and commercial applications, including material simulators, diagnostics technologies and geosurvey tool. We will collaborate with Australia SMEs and leading tech companies, and train a new generation of STEM researchers with a culture of innovation and translation.

Information about the Centre may be accessed on the Centre’s website at www.equs.org

Information about the Faculty and the School may be accessed on web site at:
School of Mathematics & Physics - www.smp.uq.edu.au
Science Faculty - www.science.uq.edu.au/

Information for Prospective Staff

Information about life at UQ including staff benefits, relocation and UQ campuses is available at - http://www.uq.edu.au/current-staff/working-at-uq

The University of Queensland Enterprise Agreement outlines the position classification standards for Levels A to E.

DUTY STATEMENT

The purpose of this position is to conduct theoretical research in the area of quantum causal relations for qubit and continuous variable systems with an emphasis on thermodynamic constraints in practical implementations. The project is primarily directed at foundational research within EQUS but will apply the tools developed to characterise causal control in experimental implementations across the Centre.

Responsibilities include development of theoretical and computational tools and planning, assessing research outcomes, and co-supervision of Honours, Masters and PhD students.

Duties

Duties and responsibilities include, but are not limited to:
Research

- Design and conduct research within the overall project, with a particular focus on quantum causal relations using the process matrix formalism.
- Collaborate with other experimental groups in EQUS with an interest in characterising quantum causal relations in implementations.
- Publish original research, jointly and/or individually, across a range of publication outlets. Present results at conferences.
- Provide co-supervision of Honours, Masters and PhD students.
- Work with colleagues in the development of new joint research projects with the objective of attracting external funding.

Teaching and Learning

- Involvement in mentoring and supervision of research students at undergraduate and postgraduate level.

Service and Engagement

- Foster 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 EQUS Chief Investigator Professor Gerard Milburn.
SELECTION CRITERIA

Essential

- A PhD or equivalent in quantum foundations with an emphasis on quantum causal relations.
- Research experience with the quantum process matrix formalism.
- Knowledge of computational techniques for neural networks.
- Track record of publication of research findings in peer reviewed journals and conferences.
- Ability to collaborate with theoretical and experimental physicists.
- Ability to work effectively both independently and collaboratively with colleagues.

Qualification Verification

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.