POSITION DESCRIPTION

Position Title: Postdoctoral Research Fellow
Organisation Unit: School of Mathematics and Physics
Position Number: 3039599
Type of Employment: Fulltime, fixed term for up to 3 years
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 CWTS Leiden Ranking (32), the Performance Ranking of Scientific Papers for World Universities (43), the US News Best Global Universities Rankings (42), QS World University Rankings (48), Academic Ranking of World Universities (55), and the Times Higher Education World University Rankings (69). Excluding the award component, UQ is now ranked 45th in the world in the ARWU, and is one of the only two Australian universities to be included in the global top 50.

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 52,000-plus strong student community includes more than 16,400 postgraduate scholars and more than 15,400 international students from 135 countries, adding to its proud 250,000-plus alumni. The University has more than 6,600 academic and professional staff (full-time equivalent) and a $1.75 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

UQ Mathematics is located in the School of Mathematics and Physics in the Faculty of Science. The Discipline is internationally recognised for its research excellence. Mathematical Physics is one of five identified areas of research concentration in the Discipline of Mathematics Strategic Plan at UQ. It consists of six full-time academic staff members who are widely published internationally and have extensive research backgrounds.

The advertised position is in the research group of Associate Professor Yao-Zhong Zhang in Mathematical Physics of the mathematics discipline, which provides an excellent research environment with world experts in fields related to proposed research project. The partner investigator of the project, Professor Wen-Li Yang, has a very close connection with mathematical physics at UQ, having been employed there for the period 2005-2009. He is based at Institute of Modern Physics at Northwest University, widely considered one of the best research institutions in Mathematical Physics in China. Other mathematical physicists at UQ with whom we closely interact recently include Dr. Ian Marquette, A/Prof. Jon Links and Prof. Mark Gould.

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

Primary Purpose of Position

The successful appointee will carry out research aligned with the Australian Research Council Discovery Project “From superintegrability to quasi-exact solvability: theory and application” awarded to Associate Professor Yao-Zhong Zhang (Chief Investigator) and Professor Wen-Li Yang (international Partner Investigator). This will involve development of novel mathematical techniques for resolving key problems in superintegrable systems, spin chains, and spin-boson models. Applications of the theoretical frameworks will be made to a variety of areas, including development of proposals for quantum correlations and computations.
Duties
Duties and responsibilities include, but are not limited to:

Research
- Conduct research and develop research program in the field of integrability and (quasi-)exact solvability as proposed in the ARC funded project.
- Develop analytical and computational methods and apply them to analyse physical properties of integrable systems and solvable models.
- Develop theoretical frameworks for characterizing solvability of spin-boson models such as the Rabi model and its generalizations.
- Publish joint research papers with chief investigator and postgraduates in leading peer-reviewed journals.
- Present research results in seminars and at national and international meetings.
- Actively participate in the activities of the research group, and work effectively in a collaborative research environment.

Service and Engagement
- Perform a range of administrative functions in the School
- Contribute to the processes that enable the academic team to manage the work of the School, including participate in School decision-making and serve on School committees
- 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 Yao-Zhong Zhang.
SELECTION CRITERIA

- PhD or equivalent in the field of mathematical or theoretical physics.
- Track record in integrability and exact solutions or in related areas.
- Demonstrated capacity for research as evidenced by publications in internationally recognised journals.
- Demonstrated ability to work effectively, both independently and collaboratively as a member of a research group.
- Expertise in algebraic structures and analytical skills is highly desirable.
- High-level of verbal and written communication skills
- Ability to interact well with colleagues, staff, and students

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.

Accessibility requirements and/or adjustments can be directed to Talha Alam at science.hr@uq.edu.au