 

**Research Assistant / Post-Doctorate Researcher**

**– Quantum Computing Theory**

**School of Mathematics, Statistics and Applied Mathematics**

**NUI Galway**

**Ref. No. NUIG-041-19**

Applications are invited from suitably qualified candidates for a full-time, fixed term position as a **Research Assistant** or **Post-Doctorate Researcher** with the School of Mathematics, Statistics and Applied Mathematics at the National University of Ireland, Galway. This position is funded by a Royal Society-Science Foundation Ireland Research Fellows Enhancement Award and has a maximum duration of 2 years, from 01 April 2019 to 31 March 2021.

The goal of this project is a theoretical investigation of Noisy Intermediate-Scale Quantum (NISQ) Computers (<https://doi.org/10.22331/q-2018-08-06-79>). The holder of the post will work in the group of Dr. Mark Howard, a newly-appointed SFI-Royal Society University Research Fellow working in the School of Maths at NUI Galway.

**Job Description:**

Quantum Computing has seen significant recent commercial investment by Google, IBM, Intel, Microsoft, Alibaba and Baidu, as well as long-term national and international funding support. Aided by this recent financial backing, experimentalists have mastered the simultaneous control of about 10-50 quantum bits (“qubits”) in a variety of different physical systems. Prototype quantum computers currently under construction will only be able to run short sequences of instructions before noise due to imperfections drowns out the useful data. Consequently, understanding and optimizing the behaviour of these NISQ computers is a crucial milestone on the journey toward large-scale "Universal" quantum computers.

The successful candidate will, depending on the strengths and preferences of the applicant, contribute to some, or all, of the duties below.

**Duties:**

* Developing theoretical techniques for simulation of quantum circuits using, for example, stabilizer-based simulators or tensor-network based simulators.
* Writing a high-performance software implementation (e.g. in Python) of simulation, compilation and/or optimization techniques.
* Designing and implementing/simulating error-correction, fault-tolerance and compilation schemes that incorporate information about real-world devices viz. connectivity and noise types/rates.
* Contribute to research outputs of the group (publications, software)

**Qualifications/Skills required:**

Applicants for Post-Doctorate Researcher must have a Ph.D. or equivalent experience (min. 4+ yrs.) in Physics, Mathematics or Computer science or a related discipline.

Applicants for Research Assistant must have completed an undergraduate degree in Physics, Mathematics or Computer science or a related discipline.

**Essential Requirements:**

* Excellent writing skills and evidence of capacity for research publication
* Excellent mathematical and/or advanced computational skills appropriate to the task
* Familiarity with the field of quantum computing and open source software therein (<https://doi.org/10.1371/journal.pone.0208561>)

**Desirable Requirements:**

* Excellent interpersonal and communication skills
* Strong record of research outputs (publications, software)
* Demonstrated experience of designing and implementing complex algorithms.
* Evidence of experience writing substantial technical reports/theses to a high quality.
* Experience with at least one of the following is highly desirable:
  + Python
  + Matlab
  + Mathematica
* Previous experience in quantum information theory or fault tolerant quantum computing

**Research Assistant: Employment permit restrictions apply for this category of post**

**Salary**: €23,310 to €39,530 per annum (pro rata for shorter contracts)

**Research Assistant**: Up to point 15 on the RA scale, €34,612 per annum. Level depends on experience.

**Post-Doctorate Researcher**: Point 1 on the Post-Doctorate Researcher Scale €39,530

**Start date**: Position is available from 01 April 2019 or as soon as possible thereafter.

A budget for travel and for purchase of a laptop will be provided.

**Continuing Professional Development/Training**:

Researchers at NUI Galway are encouraged to avail of a range of training and development opportunities designed to support their personal career development plans.

Further information on research and working at NUI Galway is available on [Research at NUI Galway](http://www.nuigalway.ie/our-research/)

For information on moving to Ireland please see [www.euraxess.ie](http://www.euraxess.ie)

Further information about the School of Mathematics, Statistics and Applied Mathematics is available at <https://www.nuigalway.ie/science/school-of-maths/>

Informal enquiries concerning the post may be made to Dr. Mark Howard: [mark.howard@nuigalway.ie](mailto:mark.howard@nuigalway.ie)

**To Apply:**

Applications to include a covering letter, CV, and the contact details of three referees should be sent, via e-mail (in word or PDF only) to Dr. Mark Howard: [mark.howard@nuigalway.ie](mailto:mark.howard@nuigalway.ie)

Please put reference number **NUIG-041-19** in subject line of e-mail application.

**Closing date for receipt of applications is 5.00 pm, Monday 18th March 2019**

All positions are recruited in line with Open, Transparent, Merit (OTM) and Competency based recruitment

National University of Ireland, Galway is an equal opportunities employer.

