Research Associate in Quantum Information Theory

Tue, 2019-08-27 10:50 - Georgia Mortzou [1] **At:** University of York, York, United Kingdom
Deadline: 21 September, 2019

Location

University of York University of York
YORK YO10 5DD United Kingdom
See map: Google Maps [2]

A Postdoctoral Research Associate (PDRA) position is available in the area of quantum technologies, supported by EPSRC's Quantum Communications Hub. The Hub, led by Professor Tim Spiller at the University of York, is a major collaboration between several universities and industrial partners and funding has just been announced for five more years. The role of the Hub is to develop new quantum communications technologies as part of the UK National Quantum Technologies Programme.

The importance of quantum random number generators (QRNGs) is widely acknowledged, as component level devices to be incorporated into small systems such as mobile phones; for authentication purposes e.g. in IoT; and as essential components in quantum communication systems. An outstanding issue for RNGs is authoritative accreditation of the output. Current tests are based on numerical analysis of the output sequence, which are useful to identify errors but cannot provide a confident bound on the degree of randomness. Stronger certification is possible for QRNGs, since the physical process used to create the output sequence can be theoretically analysed and physically tested.

In order to provide assurance for a candidate quantum random number generator it is necessary to model it as precisely as possible. The current project will involve developing appropriate models for random number generators based on commercial or near-commercial implementations. From these we will compute the amount of quantum randomness that can be generated in terms of measurable parameters and use randomness extractors to extract it. We will also investigate new protocols for QRNGs that make it easier for them to be tested and certified.

This is a theoretical project, based in the Department of Mathematics at the University of York working with Dr Roger Colbeck. It will require interfacing with an experimental team based at the National Physical Laboratory in order that the ideas developed are directly put into practice. This is a full-time position with a fixed term of three years. The start
date is 1st December 2019 or as soon as possible thereafter.

For more details and to apply, please see the full advert at
https://jobs.york.ac.uk/wd/plsql/wd_portal.show_job?p_web_site_id=3885&p_web_page_id=394451

The Application deadline is 21st September 2019

- Postdoc [3]

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