NQCC Doctoral Studentship: Good Concatenated Quantum Codes

Start Date: 1st October 2026
Application Deadline: 27th February 2026
Interview Date: March 2026

Royal Holloway, University of London and the National Quantum Computing Centre are excited to announce a call for applicants for a fully funded doctoral studentship from October 2026, under EPSRC's Industrial Doctoral Landscape Awards.

The student will contribute to the theory of error correction for quantum computers and will be supervised by Dr. Alastair Kay (RHUL) and Dr. Theodoros Kapourniotis (NQCC) . Primarily based at RHUL, the student will spend some time at NQCC as well as becoming part of the wider cohort of NQCC funded students across the UK.

We encourage the widest range of potential students to study for this studentship and are committed to welcoming students from different backgrounds and non-standard pathways. Students should have a Master's Degree in a relevant subject or be able to demonstrate equivalent experience in a professional setting.

Project Overview

Massive strides towards building useful quantum computers have been made in recent years, garnering much publicity as excitement builds over the prospect of using these amazing devices. Nevertheless, significant challenges and bottlenecks remain before we can realise their transformative potential. Perhaps the greatest challenge for us as theorists is correcting the errors that inevitably accumulate before they affect the output of the computation. We know that this *can* work, and indeed have several different possible approaches with no clear winner; each has their own unique benefits and drawbacks, aligned with different experimental implementations.

This project will be at the forefront of tackling the challenge of quantum error correction. We will study "good" quantum error correcting codes - those for which the amount of quantum data and the number of correctable errors are optimal in the limit of large codes - using a blend of mathematical analysis and computational simulation. These will allow us to evaluate noise thresholds and perform a comparison of our approach to other existing methods in the broad computational context.

Details of Award

This position is a collaborative studentship between Royal Holloway, University of London and the National Quantum Computing Centre. The position will be registered and hosted at the university, within the group of Dr. Kay. The student will also have a co-supervisor at the NQCC who is an expert in the field. Over the course of the studentship, students will be offered a minimum of three months to work at the NQCC with relevant research teams.

The studentship will fund a full-time post for 4 years (48 months), including time spent at NQCC. The award covers full-time tuition fees, and full maintenance for home students . This stipend is at an enhanced rate of £4000/year over the National Minimum Doctoral Stipend, plus London weighting. There is also provision to support engagement with the NQCC and academic travel.

This position is part of a wider cohort of 6 collaborative studentships within the NQCC's Doctoral Studentship Scheme, where projects have been co-developed by the NQCC and different academic institutes across the UK. The scheme will include cohort-based training and activities, enabling students to gain wider skills and develop valuable personal and professional networks.

Eligibility

- The studentship is open to home students only. To be treated as a home student, candidates must meet one of these criteria:
    - Be a UK national (meeting residency requirements), or
    - Have settled status , or
    - Have pre-settled status (meeting residency requirements), or
    - Have indefinite leave to remain or enter.
- Applicants should have or expect to receive a relevant Master's-level qualification (e.g. in Mathematics, Physics or a related field) by the time of taking up the appointment, or be able to demonstrate equivalent experience in a professional setting.
- An ability to communicate effectively – both verbally and in writing – is essential.
- Applicants should have some knowledge of the field of Quantum Information/Computation and would ideally be familiar with the concepts of Quantum Error Correction.
- It is desirable that candidates have some experience of coding, e.g. using python or Mathematica.

How to Apply

Please include in your application:

- Your CV.
- A brief outline (max 1 side of A4) about your motivations for undertaking this research and what you would bring to the project.
- A sample of technical writing (ideally this should be between 2,000 and 5,000 words, but this is flexible), such as an MSci project or MSc dissertation.
- Candidates invited to interview will be asked to supply a transcript of their university-level grades.
- The successful applicant will then be expected to apply formally through Royal Holloway's Applicant Portal.
- Please send your application documents to Dr. Alastair Kay (Alastair.kay@rhul.ac.uk) by the deadline of 27th February 2026.

Further Information

- For informal enquiries about the project, please contact Dr. Kay (Alastair.kay@rhul.ac.uk).