

## Research Associate in Quantum Reservoir Computing

Job Ref: REQ240146

As part of the University's ongoing commitment to redeployment, please note that this vacancy may be withdrawn at any stage of the recruitment process if a suitable redeployee is identified.

Physics Dept./School of Science

### Job Description

Job Grade: 6

**Job Purpose:** Participation in the international Quantum Reservoir Computing project (QRC-4-ESP) reporting to the Principal Investigator, Dr Alexandre Zagoskin

### Job Duties

- Build theoretical and numerical models of realistic small-to-medium scale quantum reservoirs based on superconducting qubit arrays or groups of defect-based qubits in SiC
- Investigate the behaviour of these structures in the presence of decoherence, noise and external input signals
- Design experimental protocols for testing their performance
- Analyse the results of experiments and provide advice to the experimentalists
- Develop and protect the intellectual property obtained in the course of the project
- Be responsible for conducting the day to day running of the project.
- To feed back to the project team on progress, to make recommendations for next steps.
- Write up regular progress reports and present outcomes to all Investigators and Collaborators.
- Travel to attend meetings and make presentations both within the project partners working group and to external stakeholders.
- To support the project team by enhancing relationships with existing collaborators and by assisting the establishment of relationships with new collaborators.
- To author and co-author research papers suitable for publication in high quality academic journals.
- To attend and contribute to conferences and workshops.
- To contribute to project promotion and public engagement events.
- Contribute ideas for new research and enterprise directions.
- Maintain confidentiality at all times and ensure that intellectual property (IPR) agreements are not violated.

- Engage in training programmes in the University (or elsewhere) that are consistent with the needs and aspirations of the project and those of the Department.
- Undertake other duties as may be reasonably requested and that are commensurate with the nature and grade of the post

### **Points To Note**

The purpose of this job description is to indicate the general level of duties and responsibility of the post. The detailed duties may vary from time to time without changing the general character or level of responsibility entailed.

### **Special Conditions**

All staff have a statutory responsibility to take reasonable care of themselves, others and the environment and to prevent harm by their acts or omissions. All staff are therefore required to adhere to the University's Health, Safety and Environmental Policy & Procedures.

All staff should hold a duty and commitment to observing the University's Equality & Diversity policy and procedures at all times. Duties must be carried out in accordance with relevant Equality & Diversity legislation and University policies/procedures.

Successful completion of probation will be dependent on attendance at the University's mandatory courses which include Respecting Diversity and, where appropriate, Recruitment and Selection.

### **Organisational Responsibility**

Reports to the Principal Investigator of the project.

## Person Specification

Your application will be reviewed against the essential and desirable criteria listed below. Applicants are strongly advised to explicitly state and evidence how they meet each of the essential (and desirable) criteria in their application. Stages of assessment are as follows:

- 1 – Application
- 2 – Test/Assessment Centre/Presentation
- 3 – Interview

### Essential Criteria

Area	Criteria	Stage
Experience	Experience in the field of theoretical quantum physics, quantum optics, quantum electronics, condensed matter theory or related areas	1,3
	Experience in developing theoretical models of realistic physical systems and using them in analysing experimental data	1,3
	<u>Authoring original work for academic journal papers, conference papers or reports</u>	
Skills and abilities	Fluency in analytical and numerical methods of theoretical quantum physics, quantum optics, quantum electronics, condensed matter theory and/or related fields	1,3
	Ability to work independently and as a part of a team	1,3
	Ability and willingness to closely collaborate with experimentalists	1,3
	Good <u>written and oral</u> communication skills	1,3
	<u>Self-motivated with ability to meet deadlines</u>	
	<u>Excellent interpersonal and organisational skills</u>	
Training	Willingness to undertake appropriate further training and to adopt new procedures and methods as and when required.	1,3
Qualifications	PhD in physics or another relevant STEM discipline	1
Other	<u>Commitment to observing the University's Equity and Diversity policy at all times</u>	

### Desirable Criteria

Area	Criteria	Stage
Experience	Experience in developing and protecting intellectual property	1,3

	Post-PhD experience in the field of theoretical quantum physics, quantum optics, quantum electronics, condensed matter theory or related areas	1,3
	Acquaintance with neural networks, machine learning or related topics	1,3
Skills and abilities	Ability to work with and co-supervise PhD and Masters' students	1,3
	Excellent communication skills	3
Qualifications		

## Conditions of Service

The position is FULL TIME and FIXED TERM. Salary will be on RTE Grade 6, sp34 per annum, at a starting salary to be confirmed on offer of appointment.

The appointment will be subject to the University's Terms and Conditions of Employment for STAFF GRADES 6 AND ABOVE, details of which can be found [here](#).

The University is committed to enabling staff to maintain a healthy work-home balance and has a number of family-friendly policies which can be found [here](#).

The University offers a wide range of employee benefits which can be found [here](#).

We also offer an on-campus nursery with subsidised places, subsidised places at local holiday clubs and a childcare voucher scheme (further details are available at: <http://www.lboro.ac.uk/services/hr/a-z/childcare-information---page.html>)

In addition, the University is supportive, wherever possible, of flexible working arrangements. We also strive to create a culture that supports equality and celebrates diversity throughout the campus. The University holds a Bronze Athena SWAN award which recognises the importance of support for women at all stages of their academic career. For further information on Athena SWAN see <http://www.lboro.ac.uk/services/hr/athena-swan/>

## Applications

The closing date for receipt of applications is **7<sup>th</sup> March 2024**