

## Candidate Information

<b>Position:</b>	Research Fellow
<b>School/Department:</b>	School of Mathematics and Physics
<b>Reference:</b>	22/110211
<b>Closing Date:</b>	Monday 3 October 2022
<b>Salary:</b>	£35,333 - £36,386 per annum
<b>Anticipated Interview Date:</b>	Week commencing 17 October 2022
<b>Duration:</b>	Fixed term until 30 September 2024

### JOB PURPOSE:

To be an active member of the research team working on quantum technologies at Queen's University, undertaking theoretical research towards the exploration of quantum control in levitated optomechanical systems and the study of the interplay between quantum mechanics and gravity in a parameter range accessible for a high-efficiency table-top quantum gravity sensor. The appointee will contribute to the development of theoretical techniques of experimental viability to control the quantum motion of mesoscopic levitated systems, and thus study and assess the quantum-to-classical transition induced by the interplay of such systems with gravity.

### MAJOR DUTIES:

1. Develop and plan an area of personal research and expertise, and/or undertake research under supervision within a specific research project or as a member of a research team.
2. Design, develop and refine experimental apparatus, field research or experiments in order to obtain reliable data.
3. Carry out analyses, critical evaluations, and interpretations using methodologies and other techniques appropriate to area of research.
4. Present regular progress reports on research to members of the research group or to external audiences to disseminate and publicise research findings.
5. Prepare, often in consultation with supervisor, material for publication in national and international journals and presentations at international conferences.
6. Carry out occasional undergraduate supervision, demonstrating or lecturing duties within the post holder's area of expertise and under the direct guidance of a member of academic staff.
7. Read academic papers, journals and textbooks to keep abreast of developments in own specialism and related disciplines.

### ESSENTIAL CRITERIA:

1. Normally have or be about to obtain a relevant PhD.
2. At least 3 years relevant research experience in theoretical physics, including at the postgraduate level.
3. Ability to contribute to broader management and administrative processes.
4. Contribute to the School's outreach programme by links with industry, community groups etc.
5. Sufficient breadth and depth of specialist knowledge in the discipline and of research methods and techniques to work within established research programmes.
6. Ability to communicate complex information clearly.
7. Ability to build contacts and participate in internal and external networks.
8. Demonstrable intellectual ability.
9. Ability to assess and organise resources.

### DESIRABLE CRITERIA:

1. PhD in Theoretical Quantum Optics, Quantum Information Processing, Open Quantum System Dynamics.

2. Provable research experience in one or more of the following areas:
  - Open system dynamics
  - Stochastic quantum processes
  - Quantum Information Science
  - Quantum control.
3. A substantial number of high-quality publications in international peer-reviewed journals (commensurate with the research experience).
4. Some experience in grant writing; willingness to support and complement the outreach activities of the group.
5. Numerical analysis/simulation skills (quantum unravelling, open quantum systems, collisional models, non-equilibrium quantum tools).
6. Provide evidence of independence and the ability to manage a personal network of collaborations.
7. Proven ability to work in a group as well as ability/willingness to conduct/carry on a research activity with a relevant/some/certain degree of independence; some experience with research student supervision or willingness to co-supervise a research student.
8. Enthusiasm and willingness to establish new connections/collaborations.