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PhD Studentships, Department of Physics & Astronomy, University of Sussex, UK

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PhD Studentship: Inertial sensors and lattices for Quantum Technology

A 3.5 year PhD position is available in the Atomic, Molecular and Optical Physics Group with Prof. Barry Garraway in the Department of Physics & Astronomy at the University of Sussex.



University of Sussex

The position consists of current fees and a yearly stipend of £14296 which can be supplemented by tutoring. The position also includes an annual travel allowance. You should have a physics, electrical engineering or related degree.

The physics of ultra-cold atoms provides fantastic opportunities for the development of new ideas with applications such as new and more precise sensors in quantum technology. This theory project is expected to co-operate with experimental work: the PhD student will take a leading role in the development of techniques for the control of ultra-cold atoms. The work aims to make theoretical studies of quantum systems in topologies such as atoms in elongated traps, rings, lattices, shells and toroids. The work may have applications to interferometry, rotation sensing, accelerometers and quantum information processing.

The project will build on recent proposals to make microwave loop traps [1] and lattices [2] for ultra-cold atoms that may be used for model condensed matter simulations and quantum information processing on a grid. For a recent review of related work see [3]. The project is mostly theoretical, but there may be an opportunity for experimental work, too. The project will be connected to work in the UK Quantum Technology hub in sensors and metrology as the work in this project is highly relevant, as underpinning science, to the development of quantum technologies.

The University of Sussex is located a short distance from the city of Brighton and Hove. It is a vibrant seaside location, boasting beautiful views and a huge range of activities and attractions. The city has great transport links, and the area is surrounded by unique villages and the South Downs National Park.

References: [1] Radio-frequency dressed lattices for ultracold alkali atoms, G.A. Sinuco-León and B.M. Garraway, *New J. Phys.* 17, 053037 (2015); Addressed qubit manipulation in radio-frequency dressed lattices, G.A. Sinuco-León and B.M. Garraway, *New J. Phys.* 18, 035009 (2016).

[2] Inductively guided circuits for ultracold dressed atoms, G. Sinuco-León, K. Burrows, A.S. Arnold, and B.M. Garraway, *Nat. Commun.* 5, 5289 (2014).

[3] Recent developments in trapping and manipulation of atoms with adiabatic potentials, B.M. Garraway and H. Perrin, *J. Phys. B* 49,

172001 (2016).

Type of award

Postgraduate Research

Award amount

£14296 (2016-17) per annum tax-free bursary and waiver of fees each year for 3.5 years. Full-time study

Eligibility

First class degree in Physics or similar; or a 2.1 degree with a Masters or equivalent non-UK qualifications.

Non-UK students must have English at IELTS 6.0 or equivalent, and Overseas students requiring a visa must have an English certificate.

High calibre International student applications are greatly encouraged.

Application procedure

Please apply online at <http://www.sussex.ac.uk/study/phd/apply> and say that you are applying for the PhD Studentship: Inertial sensors and lattices for Quantum Technology in the finance section.

Timetable

Early application is advised. The studentship will be allocated as soon as a suitable candidate is found.

Further information

This is a full-time studentship. With agreement of the supervisor the student may take on a limited amount of teaching, for which additional payment will be made.

The award includes an additional training grant of £1250 p.a. for short courses, books, travel, conferences etc.

Contact details

The project will be supervised by [Professor Barry Garraway](#)

Enquiries about your eligibility, the progress of your application and admission to Sussex, should be sent to [Rebecca Foster](#)

Application deadline: **1 October 2018**

For more information, please visit: www.sussex.ac.uk.

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