



1. Advertisement

Post Title: Research Fellow in Quantum Technology

School/department: School of Mathematical Sciences/Dept of Physics and Astronomy

Hours: Full time or part time hours considered up to a maximum of 1.0 FTE

Requests for flexible working options will be considered (subject to business need).

Contract: fixed term for 2 years

Reference: 7473

Salary: starting at £34,304 to £40,927 per annum, pro rata if part time

Placed on: 20 April 2022

Closing date: 31 May 2022. Applications must be received by midnight of the closing date.

Expected start date: As soon as possible.

This advert was recently posted on 20 December 2021 and 3 March 2022 – Previous Applicants need not apply.

We are delighted to offer a full-time research fellowship with the [Ion Trap Cavity-QED and Molecular Physics](#) (ITCM) group at the University of Sussex, led by [Professor Matthias Keller](#). Join our team and you will be part of an Innovate UK-funded consortium working on quantum industrial projects. Our specific research project is [CIFS – Calcium Ion Frequency Standard](#), which aims to commercialise a portable atomic clock system being developed at the University of Sussex.

Our consortium brings together leading companies from the quantum technology, telecommunication and defense sectors, such as TMD, Chronos, Leonardo, Covision and BT. Our objective is to build a miniaturized portable optical atomic clock based on a single calcium ion, with an accuracy at the 10^{-15} level or better. The final system must be able to operate outside a laboratory environment and must be suitable for production by standard industrial processes.

At ITCM, we have developed a rugged and compact spectroscopy unit, based on an all-fibre-coupled ion trap, an ultra-compact laser module providing all the necessary lasers to run the ion trap and the electronic control boards governing the autonomous operation of the system, in addition to an ultra-stable clock laser unit. All subsystems are based on fibre-integrated designs to ensure robust and maintenance free operation, while retaining a compact size.

You will join the Portable Atomic Clock team in the ITCM group and lead on updating the current sub-systems to take full advantage of the latest advances in laser and fibre technology, then to integrate them into a fully functioning portable optical clock. Focus will be on the system's performance and manufacturability, as well as developing and optimising novel spectroscopy schemes to improve the clock's stability and accuracy.

This position offers an exciting opportunity to work closely with academic and industry partners at the forefront of quantum technology in the UK, pushing some of the latest scientific and engineering developments into real-world applications.

The role is based on our campus set in the South Downs National Park just outside the city of Brighton and Hove, close to the coast and less than an hour from London. Our university follows family-friendly and flexible working policies and our group is part of the [Sussex Centre for Quantum Technologies](#).

Please contact Matthias Keller m.k.keller@sussex.ac.uk for any informal enquiries.

The University is committed to equality and valuing diversity, and applications are particularly welcomed from women and black and minority ethnic candidates, who are under-represented in academic posts in Science, Technology, Engineering, Medicine and Mathematics (STEMM) at Sussex.

Please note that this position may be subject to [ATAS clearance](#) if you require visa sponsorship.

For full details and how to apply see our [vacancies page](#)

The University of Sussex values the diversity of its staff and students and we welcome applicants from all backgrounds.

2. The School / Division

Please find further information regarding the school/division at <http://www.sussex.ac.uk/mps/>

3. Job Description

Job Description for the post of:	Research Fellow in Quantum Technology
Department:	Physics and Astronomy
Section/Unit/School:	MPS
Location:	Pevensey 2 building
Grade:	Grade 7
Responsible to:	Prof Matthias Keller through to Head of School

PRINCIPAL ACCOUNTABILITIES

1. To engage in individual and/or collaborative research activity resulting in high-quality publications; and to develop research funding and knowledge exchange income individually or in collaboration with others, as appropriate, depending on the size and scope of the bid.
2. To contribute to School teaching activities.

KEY RESPONSIBILITIES

1. Research, Scholarship & Enterprise

- 1.1 Develop research objectives and proposals for own or joint research, at acceptable levels, with assistance if required.
- 1.2 Conduct research projects individually and in collaboration with others.
- 1.3 Analyse and interpret research findings and draw conclusions on the outcomes.
- 1.4 Produce high-quality research outputs for publication in monographs or recognised high-quality journals, or performance/exhibition, as appropriate, and contribute to the School's REF submission at acceptable levels of volume and academic excellence.
- 1.5 Contribute to the preparation of proposals and applications to external bodies, for example for funding purposes.
- 1.6 Individually or with colleagues, explore opportunities for enterprise activity, knowledge exchange income and/or consultancy, where permissible.
- 1.7 Build internal contacts and participate in internal networks and relevant external networks in order to form relationships and collaborations.
- 1.8 Continually update knowledge and understanding in field or specialism, and engage in continuous professional development.

2. Teaching & Student Support

- 2.1 Undertake teaching duties, if required.
- 2.2 Assist in the assessment of student knowledge and supervision of student projects if required.
- 2.3 Assist in the development of student research skills, for example as part of a postgraduate supervision team.

3. Contribution to School & University

- 3.1 Attend and contribute to relevant School and project meetings.
- 3.2 Undertake additional duties, as required by the Principal Investigator and/or Head of School.

4. Role-specific duties

- 4.1 Planning, simulating and conduction experimental procedures and technologies for a portable atomic clock system based on trapped ions.
- 4.1 Design, build and characterise sub-systems for a compact, portable optical atomic clock.
- 4.2 Use of an optical frequency comb to measure the absolute transition frequency of calcium ions.
- 4.3 Dissemination of research findings through conference presentations and articles in journals.

This Job Description sets out current duties of the post that may vary from time to time without changing the general character of the post or level of responsibility entailed.

INDICATIVE PERFORMANCE CRITERIA

1. A PhD or equivalent scholarly or relevant professional activity
2. Pursuing a line of independent research within a research group.
3. Publishing research (either from a recently completed PhD or new original research).
4. Other forms of externally recognised professional practice of creative output of a standing equivalent to regular publication of original research.
5. Initiating, developing or participating in links between the University and external bodies such as business and industry, the professions, community organisations and policy-makers.
6. Evidence of successful engagement in teaching or supervision.

PERSON SPECIFICATION

ESSENTIAL CRITERIA

1. Normally educated to doctoral level, or other equivalent qualification, or appropriate level of experience, as appropriate to the discipline (see role-specific criteria below).
2. Evidence of engagement in high-quality research activity.
3. Excellent presentation skills, with the ability to communicate effectively, both orally and in writing, with students, colleagues and external audiences.
4. Ability to work individually on own initiative and without close supervision, and as part of a team.
5. Ability to exercise a degree of innovation and creative problem-solving.
6. Excellent organisational and administrative skills.
7. Ability to prioritise and meet deadlines.
8. Excellent IT skills.

ESSENTIAL ROLE-SPECIFIC CRITERIA

1. PhD in experimental quantum optics, atomic clocks, laser- or atomic physics or electronics engineering.
2. An up to date working knowledge in the field of experimental quantum optics, laser- or atomic physics
3. Skills in working with optics and lasers or electronics
4. Competence in using data acquisition software (LabView) and data analysis software.
5. Good communication skills, written and oral.
6. Experience in experiments in atomic or ion physics.
7. Experience in handling of ultra-high vacuum equipment.

DESIRABLE CRITERIA

1. Emerging track record of high-quality publications in reputable journals and other appropriate media of similar standing.
2. Experience of generating research or knowledge exchange income.
3. Solid knowledge of quantum optics, atomic or ion physics.
4. Experience in laser-manipulation of neutral atoms or ions.

DESIRABLE ROLE-SPECIFIC CRITERIA

Experience in one or more of the specific: ion trapping, atomic clock research, precision spectroscopy.