Role profile

Job title: Research Associate/Fellow in Quantum Sensing and Optical Magnetometry

Job family and level: Research and Teaching Level 4 (Appointment will be Level 4 Career training grade where an appointment is made before PhD has been completed)

School/Department: Physics & Astronomy

Location: University Park Campus

Purpose of role

The person appointed to this role will carry out experimental research and technological development of quantum sensors. More specifically, the person will develop optically pumped magnetometers (based on cesium atomic vapor) and investigate possible applications, for instance within medicine (brain imaging, cardiology, etc.). The project is funded by the UK National Quantum Technology Hub in Sensing and Timing.

Preparation of scientific publications, assistance in the supervision of younger colleagues, and project reporting are also part of the responsibilities. As part of a research team, the post holder will be expected to plan and conduct laboratory based work using appropriate approaches, methodologies and techniques. Further responsibilities include the daily supervision of younger colleagues, reporting and writing of scientific publications, and contribution to the project organisation and development of further opportunities. The role holder will have the opportunity to use their initiative and creativity to identify areas for research, develop research methods and extend their research portfolio.

Main responsibilities

(Primary accountabilities and responsibilities expected to fulfil the role)

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<th>% time per year</th>
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<td>60 %</td>
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1. **Experimental research**
   - Plan and manage own research activity and resolve problems, if required, in meeting own/team research objectives and deadlines in collaboration with others
   - Analyse and illuminate data, interpret reports, evaluate and criticise texts and bring new insights to research area
   - Write up research work for publication and/or contribute to the dissemination at national/international conferences, resulting in successful research outputs

2. **Supervision**
   - Provide support, guidance and supervision to other staff, where appropriate in own area of expertise
   - Supervise undergraduate and/or postgraduate students’ projects, fieldwork and placements, as appropriate. To participate in the assessment of student knowledge and co-supervise projects at Masters level
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<th>Project management</th>
<th>Collaboration and further opportunities</th>
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| 3 | - Co-ordinate the operational aspect of research networks, for example, arranging meetings and updating websites etc. and contribute to collaborative decision making with colleagues in area of research  
   - Utilise and contribute to organising research resources and facilities, laboratories and workshops as appropriate | - Collaborate with academic colleagues and/or external partners on joint research projects  
   - Identify opportunities and assist in writing bids for research grant applications. Prepare proposals and applications to both external and/or internal bodies for funding, contractual or accreditation purposes  
   - Build relationships with both internal and external contacts in order to exchange information, to form relationships for future collaborations and identify potential sources of funds and/or opportunities for collaboration |
|   | 10 %               | 10 %                                     |
## Person specification

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<th>Essential</th>
<th>Desirable</th>
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| **Skills**           | ▪ Excellent oral and written communication skills, including the ability to communicate with clarity on complex information.  
                         ▪ High analytical ability to analyse and illuminate data, interprets reports, evaluate and criticise texts and bring new insights.  
                         ▪ Ability to creatively apply relevant research approaches, models, techniques and methods.  
                         ▪ Ability to assess and organise resource requirements and deploy effectively.  
                         ▪ Ability to build relationships and collaborate with others, both internally and externally. | ▪ Ability to foster a research culture and commitment to learn in others.  
                         ▪ Practical knowledge of lasers, optics, electronics, 3D printing, and/or programming/experimental control.  
                         ▪ Skills in manufacturing/fabricating and/or testing vapor cells. |
| **Knowledge and experience** | ▪ Robust background in experimental physics.  
                         ▪ Practical experience of applying the specialist skills and approaches and techniques required for the role.  
                         ▪ Experience in use of research methodologies and techniques to work within area. | ▪ Experience in both experimental and theoretical research.  
                         ▪ Experience in experimental quantum physics/optics/technology or related experimental areas.  
                         ▪ Expertise in optically pumped magnetometers.  
                         ▪ Previous success in gaining support for externally funded research projects.  
                         ▪ Experience of developing new approaches, models, techniques or methods in research area. |
| **Qualifications, certification and training (relevant to role)** | ▪ PhD, or be near completion, in physics or a related discipline or the equivalent in professional qualifications and experience in research area. |  |
Expectations and behaviours

The University has developed a clear set of core expectations and behaviours that our people should be demonstrating in their work, and as ambassadors of the University’s strategy, vision and values. The following are essential to the role:

**Valuing people**
Is always equitable and fair and works with integrity. Proactively looks for ways to develop the team and is comfortable providing clarity by explaining the rationale behind decisions.

**Taking ownership**
Is highly self-aware, looking for ways to improve, both taking on board and offering constructive feedback. Inspires others to take accountability for their own areas.

**Forward thinking**
Driven to question the status quo and explore new ideas, supporting the team to “lead the way” in terms of know-how and learning.

**Professional pride**
Sets the bar high with quality systems and control measures in place. Demands high standards of others identifying and addressing any gaps to enhance the overall performance.

**Always inclusive**
Ensures accessibility to the wider community, actively encouraging inclusion and seeking to involve others. Ensures others always consider the wider context when sharing information making full use of networks and connections.

Key relationships with others
Decision making

Taken independently by the role holder

- Planning the implementation of the specific research programme.
- Making individual/team decisions about design and conduct of particular research methods experiments.
- Daily support to research students and other team members.
- Maintenance and repair of equipment and apparatus.
- Advice on consumable and small scale purchasing.

Taken in collaboration with others

- Planning the direction of the specific research programme.
- Strategy for medium term research programme.
- Collaborative research applications.
- Direction of students/collaborators research.
- Decisions about alterations to or new apparatus/equipment for the group.
- Publication decisions, papers, conference abstracts etc.

Referred to the appropriate line manager (please name) by the role holder

- Wider research strategy of our research group
- Purchase decisions >£300 where the role holder is not the principal investigator