1 Advertisement

Post Title: Research Fellow in Experimental Photonics
School/department: Mathematical and Physical Sciences /Physics and Astronomy
Hours: full time or part time hours considered up to a maximum of 1.0FTE
Requests for flexible working options will be considered (subject to business need).
Contract: fixed term initially for 1 year with the possibility of extension for another 2 years
Reference: 6557
Salary: starting at £34,304 to £40,927 per annum, pro rata if part time
Placed on: 8 November 2021
Closing date: 6 December 2021. Applications must be received by midnight of the closing date.
Expected start date: as soon as possible

This advert was recently posted on 03 August 2021 – Previous Applicants need not apply.

Applications are invited for a Postdoctoral Research Fellow in Experimental Photonics at the Emergent Photonics Lab [http://www.sussex.ac.uk/physics/epic](http://www.sussex.ac.uk/physics/epic) in the Department of Physics & Astronomy at the University of Sussex.

The duration of the position is originally for 1 year with the possibility of an extension for a further 2 years based on research requirements. **The position is part of the ERC funded project TELSCOMBE-Temporal Laser Cavity-Solitons for Microcombs** (for a value of about £1,200,000) – led by Dr Alessia Paquazi.

It involves the development of novel approaches towards the realisation of compact optical frequency combs in microresonators. Key to the project success are elements directly inherited from nonlinear photonics, fibre photonics, mode-locked lasers and optical frequency combs. This project transversely intersects the kernel of our research interests. The outcomes are likely to have a key impact in several domains, from quantum technologies to environmental sensing, metrology, manufacturing, and others.

The successful applicant should have a PhD in a field related to our research areas, nonlinear photonics, ultrafast photonics, nonlinear wave propagation, and background preferably intersecting soliton theory and optical complexity with a good publication record.

Previous experimental experience with photonic benches implementation would be desirable, along with basic knowledge of ultrafast laser operation and a history of international involvement and aggressive publication strategy.

Evidence of potential leadership, independence and a strong motivation are also essential. Some of the typical tasks for this position include the operation of ultrafast fibre-lasers and optical frequency combs, the design of optical benches, the acquisition of data using fast electronics and their analysis.

The Emergent Photonics Laboratory directed by Alessia Pasquazi and Marco Peccianti, has been established at the University of Sussex with an investment exceeding £6M in equipment and a number research-supporting fellowships and personal grants. Our research aims to develop new photonic technologies, spanning from integrated ultrafast optical devices to optical clocks and THz technology.
The laboratory staff is currently formed by six PhD students, four Post-Docs and two faculty members. Lab activities involve a variable number (four to six) of MPhys and MSc students and internship students.

The successful candidate is expected to actively engage in our research plans, to provide guidance to undergraduate and postgraduate students, to participate in the strategic planning of the group and to contribute to drafting successful research bids.

It is expected to travel among our network of collaborators. The salary offered will be appropriate to the qualifications, standing and experience of the successful candidate.

Please contact Dr Alessia Pasquazi (a.pasquazi@sussex.ac.uk) for 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 https://www.sussex.ac.uk/study/subjects/physics-and-astronomy

3. Job Description

Job Description for the post of: Research Fellow in Photonics

Department: Physics and Astronomy

Section/Unit/School: Mathematical and Physical Sciences

Location: Pevensey II, Falmer Campus

Grade: Research Fellow I, Grade 7

Responsible to: Dr Alessia Pasquazi

Role description: Research Fellow I is an early career-grade research position. Post-holders will be expected to contribute to the work of the research team and also to develop their research skills with support from more experienced members of staff.
PRINCIPAL ACCOUNTABILITIES

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. 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 international 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**

1. Operation and construction ultrafast nonlinear optics diagnostic benches
2. Design, implementation and testing of nonlinear imaging systems based on ultrashort optical pulses and optical propagation in complex media.
3. Assistance in the supervision of undergraduate and doctoral students.
4. Dissemination of research findings.
5. Prepare proposals and reports to external bodies, e.g. for funding and contractual purposes.
6. Participate in shaping research directions and leadership, making use of detailed expertise in the research area
7. Very active participation in the general research endeavour of the research group,

**Specific Duties (they also contributes to composing the essential person specifications)**

1. **Operation and construction ultrafast nonlinear optics diagnostic benches**
   
   This involves work with a state-of-the-ultrafast lasers source, and understanding of the principle of the nonlinear field matter interaction.

2. **Design, implementation and testing of nonlinear systems based on micro-cavities and fibre lasers**
   
   The central part of the project is the exploitation of nonlinear optical phenomena and complex light propagation within novel concepts for the generation of optical frequency combs within micro-resonators. The candidate is expected (i) to independently investigate, understand and model the nonlinear interactions (ii) to experimentally and theoretically contribute to the enlargement of the backgrounds established within the Emergent Photonics Laboratory and (iii) to contribute to the creation of novel foreground towards the project objectives. Details will be discussed at the interview stage.

3. **Assistance in the supervision of undergraduate and postgraduate students**
   
   Helping in the supervision of the undergraduate and postgraduate students in the group.

4. **Dissemination of research findings**
   
   Ability to lead independently the dissemination on different routes is considered critical, e.g. conference presentations writing articles for very selective scientific outlets, preparing outreach material.

5. **Prepare funding proposals and reports to external bodies, e.g. for funding and contractual purposes.**
   
   Participate and lead in the preparation of research applications to external bodies.

6. **Participate in shaping research directions and leadership, making use of detailed expertise in the research area**
   
   Building on solid knowledge in the research area, you take a prominent role in shaping research directions of the group.
7. **Very active participation in the general research endeavour of the research group**, Interaction with peers and students is paramount in the development of our research plans. Hence, interaction and networking abilities are critical.

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

**INDICATIVE PERFORMANCE CRITERIA**

- A PhD or equivalent scholarly or relevant professional activity
- Pursuing a line of independent research within a research group.
- Effective dissemination strategy with high-quality outputs.
- Other forms of externally recognised professional practice of creative output of a standing equivalent to regular publication of original research.
- Initiating, developing or participating in links between the University and external bodies such as business and industry, the professions, community organizations and policy-makers.
- Evidence of successful engagement in teaching and/or supervision.
- Evidence of contribution to the research endeavour of the research group, within the roles and activities, as required by the group development.

4. **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, with partial or total leadership.
3. Excellent presentation skills, with the ability to communicate effectively, both orally and in writing, with students, colleagues and external audiences.
4. Evidence of work within international networks.
5. Ability to work individually on own initiative and without close supervision, and as part of a team.
6. Ability to consolidate and managing a critical core of researchers around a specific research endeavour.
7. Strong Motivation for drafting research proposals and seeking for research funding.
8. Ability to exercise a degree of innovation and creative problem-solving.
9. Excellent organisational and administrative skills.
10. Ability to prioritise and meet deadlines.
11. Excellent IT skills.
12. Report at project meetings and present results at other sites as required.
13. Coordinate meetings with staff and collaborators.
14. Carry out routine administrative tasks associated with a specified research project, for example risk assessment of research tasks, organisation of project meetings and documentation. This will entail planning own day-to-day research activity within the framework of the agreed programme, dealing with problems that may affect the achievement of research objectives and deadlines and implementing procedures required to ensure accurate and timely delivery.

DESIRABLE CRITERIA
1. Emerging track record of high-quality publications in selective publication outlets and other appropriate media of similar standing.
2. Experience in generating research or knowledge exchange income.

ROLE-SPECIFIC CRITERIA

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<tr>
<th>SKILLS / ABILITIES</th>
<th>Essential</th>
<th>Desirable</th>
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<tbody>
<tr>
<td>Ability to carry out original research in experimental photonics research within the project subject</td>
<td>✓</td>
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<td>Abilities in modelling experimental observation in ultrafast photonics within the project subject</td>
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<td>Competence in using data acquisition software (MATLAB - LABVIEW) and data analysis software</td>
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<td>✓</td>
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<td>Excellent communication and dissemination skills, written and oral</td>
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<td>Electronics skills</td>
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<td>Writing journal articles</td>
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<td>Skills in working ultrafast photonics</td>
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<td>Clear leadership potential in the specific research area</td>
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<td>Ability to give oral and written reports on project progress and outcomes. Ability to report at both a technical low-level and conceptual high-level to a</td>
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range of audiences including the public and industry.

Ability to continually update knowledge and develop skills ✓

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<th>KNOWLEDGE</th>
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<th>Desirable</th>
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<tr>
<td>Photonic materials and technologies</td>
<td>✓</td>
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<td>Nonlinear Optics</td>
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<td>Fibre Optics</td>
<td>✓</td>
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<tr>
<td>Laser Optics</td>
<td>✓</td>
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<th>EXPERIENCE</th>
<th>Essential</th>
<th>Desirable</th>
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<tr>
<td>Experimental experience in optics and photonics</td>
<td>✓</td>
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<tr>
<td>Experimental experience in nonlinear optics</td>
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<tr>
<td>Handling of ultrafast lasers</td>
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<td>✓</td>
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<tr>
<td>Theoretical experience with nonlinear propagation</td>
<td>✓</td>
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<td>Proven record of writing journal articles</td>
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<tr>
<td>Proven record of output in very selective research outlets</td>
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<th>QUALIFICATIONS</th>
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<tr>
<td>PhD in experimental optics, photonics or equivalent level of scholarly achievement</td>
<td>✓</td>
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<td>A proven track record of experience in photonics in overlap with the post field.</td>
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<th>PERSONAL ATTRIBUTES AND CIRCUMSTANCES</th>
<th>Essential</th>
<th>Desirable</th>
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<tr>
<td>Ability to work independently</td>
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<td>Active commitment to team work</td>
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<td>Demonstrated leadership abilities</td>
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