



## 1 Advertisement

**Post Title:** Research Fellow in Photonics

**School/department** Mathematical and Physical Sciences/Physics & Astronomy

**Hours:** Full Time considered up to a maximum of 100% FTE

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

**Contract:** fixed term until 31 May 2023

**Reference:** 6295

**Salary:** starting at £33,797 to £40,322 per annum, pro rata if part time

**Placed on:** 26 July 2021

**Closing date:** 16 August 2021 Applications must be received by midnight of the closing date.

**Expected start date:** As soon as possible.

Applications are invited for a Postdoctoral Research Fellow in Photonics at the Emergent Photonics Lab <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 project TIMING funded the European Research Council (for a value of about 1.7 Million of GBP).

It involves novel approaches to imaging and a spectrum of nonlinear field-matter interactions, including processes that generate Terahertz waves.

The successful applicant should have a PhD in a field related to our research area e.g. nonlinear Photonics, Ultrafast Photonics, optical nonlinearity in condensed matter, with a relevant publication record.

Experimental and/or theoretical expertise in the in terahertz imaging, ultrafast imaging or single-pixel imaging is highly desirable, although researchers with other scientific and technical skill-sets relevant to the project will be considered.

Experience with photonic benches implementation will be also considered, along with basic knowledge of Terahertz photonics and a history of international involvement and a proficient dissemination strategy.

Evidence of potential leadership, independence and strong motivation are also essential.

Some of the typical tasks for this position include the operation of high-power lasers and optics, the design of optical benches and the analysis of the observed field-matter interactions.

The laboratory staff is currently formed by 6 PhD students, 4 Post-Docs and two faculty members. The lab has collaborations with universities and other research facilities around the world.

The successful candidate is expected as core activity 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. They are 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 Prof Marco Peccianti – [m.peccianti@sussex.ac.uk](mailto:m.peccianti@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

|                             |                                    |
|-----------------------------|------------------------------------|
| <b>Department:</b>          | <b>Physics and Astronomy</b>       |
| <b>Section/Unit/School:</b> | Mathematical and Physical Sciences |
| <b>Location:</b>            | Pevensey II, Falmer Campus         |
| <b>Grade:</b>               | Research Fellow I, Grade 7         |
| <b>Responsible to:</b>      | Prof. Marco Peccianti              |

**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. Analysis of terahertz imaging principles:**

The physical theoretical modelling of imaging principles involving field-matter (near-field) interaction of terahertz waves, including the propagation in complex media.

#### **2. Operation and construction ultrafast imaging systems:**

The candidate is expected (i) to independently investigate, understand linear and nonlinear interactions involved in the generation, propagation and detection of terahertz waves (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 top-ranked journals and other appropriate media of similar standing.
2. Experience in generating research or knowledge exchange income.

### **ROLE-SPECIFIC CRITERIA**

**SKILLS / ABILITIES**

|  | Essential | Desirable |
|--|-----------|-----------|
| Ability to carry out original research in experimental photonics research in terahertz imaging | ✓         |           |
| Abilities of theoretical modelling terahertz field-matter interaction in imaging systems       | ✓         |           |
| Competence in using data acquisition software (MATLAB - LABVIEW) and data analysis software    |           | ✓         |
| Excellent communication and dissemination skills, written and oral                             | ✓         |           |
| Electronics skills   |           | ✓         |
| Writing journal articles   | ✓         |           |
| Skills in working ultrafast photonics  |           | ✓         |

|   |   |  |
|---|---|--|
| Clear leadership potential in the specific research area  | ✓ |  |
| 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 range of audiences including the public and industry. | ✓ |  |
| Ability to continually update knowledge and develop skills  | ✓ |  |

**KNOWLEDGE**

|                       | Essential | Desirable |
|-----------------------|-----------|-----------|
| Ultrafast Photonics   | ✓         |           |
| Terahertz Photonics   |           | ✓         |
| Optical Complexity    |           | ✓         |
| Computational Imaging | ✓         |           |

**EXPERIENCE**

|   | Essential | Desirable |
|---|-----------|-----------|
| Experimental experience in optics and photonics                               | ✓         |           |
| Experimental experience in Terahertz Photonics                                |           | ✓         |
| Handling of ultrafast lasers  | ✓         |           |
| Theoretical experience with photonic imaging                                  |           | ✓         |
| Proven record of sustained scientific outputs and of writing journal articles | ✓         |           |
| Proven record of writing high profile journal articles                        |           | ✓         |

**QUALIFICATIONS**

|  | Essential | Desirable |
|--|-----------|-----------|
|--|-----------|-----------|

|  |   |  |
|--|---|--|
| PhD in experimental optics, photonics or equivalent level of scholarly achievement | ✓ |  |
| A proven track record of experience in photonics in overlap with the post field.   | ✓ |  |

**PERSONAL ATTRIBUTES AND CIRCUMSTANCES**      Essential      Desirable

|                                |   |  |
|--------------------------------|---|--|
| Ability to work independently  | ✓ |  |
| Active commitment to team work | ✓ |  |

|                                   |   |  |
|-----------------------------------|---|--|
| Demonstrated leadership abilities | ✓ |  |
|-----------------------------------|---|--|