



## 1 Advertisement

**Post Title:** Research Fellow in Experimental Particle Physics

**School/department:** School of Mathematical and Physical Sciences, Department of Physics & Astronomy

**Hours:** Full time. Requests for flexible working options will be considered (subject to business need).

**Contract:** fixed term until 30/09/2025

**Reference:** 20410

**Salary:** starting at £36,333 to £43,155 per annum

**Placed on:** 13 April 2023

**Closing date:** 12 May 2023 Applications must be received by midnight of the closing date.

**Expected Interview date:** to be confirmed

**Expected start date:** 01 June 2023, or as soon as possible thereafter.

Applications are invited for a Postdoctoral Research Fellowship in Experimental Particle Physics. You will join Sussex's vibrant research programme on opaque scintillator detector R&D (LiquidO) and the newly funded CLOUD reactor neutrino experiment that will exploit this novel technology.

The high-resolution imaging capabilities of opaque scintillator detectors in combination with machine learning for particle classification present a fascinating new area of research that you will have the opportunity to drive forwards. Experience with machine learning from any large physics experiment would be welcome.

The Sussex group's activities range from the development and construction of prototype opaque scintillator devices to the study of new types of fibres and new opaque scintillators, through DAQ systems to Geant4 simulation of the detectors, reconstruction and data analysis. You will have the opportunity to be involved in any of these areas, including on the CLOUD experiment that will record around 10,000 neutrinos a day with unprecedented signal to background.

Informal enquiries may be addressed to Prof. Jeff Hartnell ([j.j.hartnell@sussex.ac.uk](mailto:j.j.hartnell@sussex.ac.uk)) or Dr. Clark Griffith ([w.c.griffith@sussex.ac.uk](mailto:w.c.griffith@sussex.ac.uk)).

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.

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/physics/research/>

## **3. Job Description**

Job Description for the post of: Research Fellow in Experimental Particle Physics

**Department:** Physics and Astronomy

**Section/Unit/School:** School of Mathematical and Physical Sciences

**Location:** Physics and Astronomy, Falmer Campus, Brighton

**Grade:** Research Fellow I, Grade 7

**Responsible to:** Jeff Hartnell, Professor of Physics

**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**

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.

## **4. Person Specification**

### **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 Carry out research relating to the CLOUD neutrino experiment.
- 4.2 Carry out R&D on opaque scintillator detectors.
- 4.3 Present/discuss the group's activities at working group and collaboration meetings.
- 4.4 Publish papers on the work you are involved in.

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**

- A PhD or equivalent scholarly or relevant professional activity.

- Pursuing a line of independent research within a research group.
- Publishing research (either from a recently completed PhD or new original research).
- 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 organisations and policy-makers.
- Evidence of successful engagement in teaching or supervision.

## **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. Expertise with complex computing systems for particle physics experiments or similar.
2. Ability to efficiently process and analyse large-scale experimental data.
3. Experience in the analysis of data from a particle physics experiment or similar.
4. Excellent C++/other language programming and IT skills
5. Commitment to learning new software skills when required, possibly by attending appropriate training.
6. High level of numerical and analytical skills.
7. Demonstrated initiative and creativity in developing an existing experimental programme.
8. Willing and able to travel to and spend time abroad and to other locations in the UK and abroad, including for extended periods of time, as required.

9. Flexibility to work outside normal hours if required.
10. Willing and able to carry out work underground and in radiation protected zones if necessary.

## **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. Evidence of successful engagement in teaching and/or the supervision of students.
4. Experience with DAQ and/or trigger systems from a particle physics experiment or similar.
5. Detailed knowledge of scintillator detectors and wavelength-shifting fibres.
6. Detailed knowledge of neutrino physics and low-background techniques.
7. Detailed knowledge of machine learning techniques applied to physics experiments.