1 Advertisement

Post Title: Research Fellow in Theoretical Particle Physics

School/department: School of Mathematical Sciences

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

Contract: fixed term for 36 months

Reference: 2816

Salary: starting at £33,797 and rising to £40,322 per annum

Start date: 01 October 2020

Placed on: 06 December 2019

Closing date: 06 January 2020. Applications must be received by midnight of the closing date. Late applications may be considered until the post has been filled.

Expected Interview date: early January 2020

Expected start date: 01 October 2020

A postdoctoral research associate is sought to join the South-Eastern Particle Theory Alliance (SEPTA), a consortium composed of Royal Holloway, University of London, University College London and the University of Sussex. The successful applicant will join a research group working on a wide range of topics covering quantum field theory and quantum gravity, particle physics, phenomenology, particle astrophysics and cosmology.

This position is devoted to research in the areas of quantum field theory, quantum gravity, and model building, and will be based at the University of Sussex. We are genuinely interested in applicants with experience in any of the following fields: quantum gravity, UV completions of the standard model, matter-gauge theories, and formal advances/techniques in quantum field theory (e.g. renormalisation group, large N equivalences, dualities, supersymmetry). Applicants with an interest in the asymptotic safety conjecture for particle physics and gravity are particularly encouraged to apply.

Applicants will also benefit from close links to the Experimental Particle Physics groups at Sussex and RHUL, to the Sussex Astronomy Centre, and from membership of the NExT Institute, a regional particle physics alliance in the South-East of England including both Sussex and RHUL, as well as the Rutherford Appleton Laboratory, the University of Southampton, and Queen Mary, University of London.

The following materials should be sent by email to mpsrecruitment@sussex.ac.uk and D.Litim@sussex.ac.uk, quoting the job reference number above.

- Official Sussex application form (available via the University website www.sussex.ac.uk/jobs)
- CV, list of publications, covering letter which details your experience and strengths, and a statement of research interests in a single pdf document
- Three recommendation letters.

Candidates are encouraged to make informal contact with Daniel Litim (D.Litim@sussex.ac.uk).

The application deadline is 6th January 2020. Late applications may be considered until the post has been filled.

Sussex Particle Theory web site: http://www.sussex.ac.uk/tpp
NExT Institute: http://next-institute.ac.uk
Sussex jobs web site: http://www.sussex.ac.uk/jobs

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

2. **The School / Division**

**The School of Mathematical & Physical Sciences**

The School of Mathematical and Physical Sciences was created in 2009 as part of a University wide restructuring. It brings together two outstanding and progressive departments – Mathematics, and Physics & Astronomy. The School aims to capitalise on the synergy between these subjects to deliver new and challenging opportunities for faculty and students.

The School of Mathematical and Physical Sciences combines pioneering research and stimulating teaching in an interdisciplinary academic setting. The faculty work at the frontiers of their fields, as is reflected in the recent growth of both subjects. Each department has a number of thriving research groups and links with outside agencies.

The Head of School is Professor Philip Harris. He is supported in his role by an Executive Committee consisting of the Heads of Department, the Director of Teaching and Learning, Director of Student Experience, Director of Recruitment and Admissions, Director of Research and Knowledge Exchange, Director of Doctoral Studies, School Administrator, Technical Services Manager, Director of Diversity and Equality, and a student representative.

**The Department of Mathematics**

The Department of Mathematics currently has 24 faculty divided into six research areas: Analysis and PDEs, Geometry and Topology, Mathematics Applied to Biology, Mathematical Physics, Numerical Analysis and Scientific Computing, and Probability and Statistics.

In the 2014 research excellence framework (REF), 81 per cent of the research outputs in Mathematics at Sussex were rated as world-leading (4*) or internationally excellent (3*). Mathematics at Sussex was ranked 21st in the UK in a recent league tables [Guardian 2017]. It also repeatedly scores well in the UK National Student Survey.

The Department has more than 370 undergraduate students, 99 MSc students, more than 50 PhD students and 2 research fellows.
Research groups in Mathematics

Analysis and PDEs
http://www.sussex.ac.uk/apde/

Mathematics Applied to Biology
http://www.sussex.ac.uk/mab/

Mathematical Physics
http://www.sussex.ac.uk/maths/research/ms

Numerical Analysis and Scientific Computing
http://www.sussex.ac.uk/nasc/

Geometry and Topology
http://www.sussex.ac.uk/maths/research/geotop

Probability and Statistics
http://www.sussex.ac.uk/maths/research/pas

The Department of Physics and Astronomy

The Physics & Astronomy Department currently has 42 faculty divided into five research groups: Astronomy; Theoretical Particle Physics; Experimental Particle Physics; Materials Physics; and Atomic, Molecular & Optical Physics, carrying out internationally leading research in all these areas.

We are part of the South East Physics Network (SEPNet) – a consortium of the nine physics departments of the University of Sussex, University of Kent, Queen Mary University of London, Royal Holloway University of London, Southampton University, University of Surrey, University of Portsmouth, University of Hertfordshire, and the Open University. This was established with substantial government funding to support vital UK science research, teaching and development.

The Department is ranked 15th in the UK according to the Guardian University Guide (2018) including being ranked 1st for graduate prospects. We score very well on the National Student Survey including 100% for overall satisfaction in 2013.

The Department has approximately 350 undergraduate students, 30 MSc students, over 110 PhD students and 40 postdoctoral fellows.

Research groups in Physics & Astronomy

The Astronomy Centre
http://www.sussex.ac.uk/astronomy/
JOB DESCRIPTION

CORE JOB DESCRIPTION

Job Title: Research Fellow in Theoretical Particle Physics
Grade: Research Fellow I, Grade 7
School: MPS
Location: Pevensey II
Responsible to: Principal Investigator through to Head of School
Direct reports: n/a
Key contacts: Members of research group, members of faculty within the School and University.

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.

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 To carry out original research in the area of theoretical particle physics, within a sub-area relating to the topics funded by our STFC rolling grant (fixe points of quantum field theory).

4.2 Participate in the host group’s regular meetings and seminars, assisting with their organisation if required.

4.3 Seek and exploit collaborations within the SEPTA research consortium.

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 policymakers.
- 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.
ESSENTIAL ROLE-SPECIFIC CRITERIA

1. High level of knowledge and skill in theoretical particle physics.
2. Established publication record in the areas of quantum gravity, quantum field theory, or asymptotic safety conjecture, broadly defined.
3. Willingness and ability to travel to collaborative meetings and conferences as required.

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. Excellent IT skills.

DESIRABLE ROLE-SPECIFIC CRITERIA

Experience in and complementing one or more of the specific fields of the quantum field theory research area: quantum field theory and quantum gravity, renormalization group methods, asymptotic safety conjecture in particle physics and gravity, formal aspects of field theory such as equivalences, dualities and critical points, exact methods from supersymmetry, Beyond-Standard-Model model building.

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.