School of Mathematical and Physical Sciences  
Department of Physics & Astronomy  
Research Fellow in Experimental Particle Physics (Full time, fixed term until 30 September 2019)  
Salary range: starting at £32,004 and rising to £38,183 per annum  
Expected interview date: May 2017  
Expected start date: 1 June 2017, or as soon as possible thereafter.

The Sussex Experimental Particle Physics (EPP) group invites applications to a postdoctoral Research Fellow position focused on the analysis of data collected by the ATLAS experiment at the Large Hadron Collider. The post is funded on the group’s Consolidated Grant, awarded by the Science and Technology Facilities Council (STFC). The post is funded initially until 30 September 2019, with possibility of renewal thereafter subject to the availability of funding.

The Sussex ATLAS team, led by Prof Antonella De Santo, currently counts five full-time academics, four full-time postdoctoral researchers (in addition to this post), nine PhD students, and several Masters-level students. The team has a leading role in several areas of the ATLAS physics programme, with strong focus on supersymmetry and other new physics searches, as well as flavour physics, top physics, Higgs boson physics and jet substructure. Sussex also plays a significant role on the ATLAS Trigger system, including in view of future upgrades, and on experimental operations.

The postholder, who will work closely with Prof De Santo, is expected to drive Sussex’s effort on the search for electroweak production of supersymmetric particles at ATLAS. This is a crucial area where Sussex seeks to maintain its long-standing leadership and expertise. The postholder will also contribute to the delivery of Sussex’s technical responsibilities on the ATLAS experiment.

Candidates will hold a doctorate in experimental particle physics, or an equivalent degree, and have a strong track record of internationally recognised research at large-scale collider physics experiments.

Sussex EPP (http://www.sussex.ac.uk/epp/) is one of five research groups within the Department of Physics and Astronomy (http://www.sussex.ac.uk/physics/). In addition to its involvement in ATLAS, the group is renowned for its leadership on high-precision experimental tests of physics beyond the Standard Model, with strong focus on neutrino and neutron physics.

Informal enquiries may be addressed to Prof De Santo (a.de-santo@sussex.ac.uk).

Closing date for applications: 4 May 2017

Interviews for this post are currently planned for the second half of May 2017.

The University of Sussex is committed to equality of opportunity.

For full details and how to apply see our vacancies page.
2. Senior leadership and management

The Vice-Chancellor is the senior academic officer and, as Chief Executive, is responsible to the University Council for management of the University. He is supported by an executive group which includes a team of Pro-Vice-Chancellors, the Registrar and Secretary, the Director of Finance and the Director of Human Resources. The Heads of the Schools of Studies at Sussex report to the Pro-Vice-Chancellors.

3. The School

The School of Mathematical and Physical Sciences

The School of Mathematical and Physical Sciences brings together two outstanding and progressive departments – Mathematics, and Physics and Astronomy. The School combines pioneering research and stimulating teaching in an interdisciplinary academic setting. Both departments count a number of thriving research groups and links with outside agencies.

The Department of Physics and Astronomy

The Department of Physics and Astronomy currently has 40 faculty who are active in five research groups: Astronomy; Theoretical Particle Physics; Experimental Particle Physics; Atomic, Molecular & Optical Physics; and Condensed Matter Physics.

Sussex is part of the South East Physics Network (SEPNet, http://www.sepnet.ac.uk) - a consortium of 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.

The Department has approximately 350 undergraduate students, 30 MSc students, 100 PhD students and 40 postdoctoral fellows.

The Experimental Particle Physics (EPP) Group

The Sussex EPP group (http://www.sussex.ac.uk/epp) counts ten permanent faculty members, nine postdoctoral level researchers, nineteen PhD students, and four engineer/technician posts directly involved in EPP research.

The group’s main source of funding is the Science and Technology Facilities Council (STFC), with additional support from the European Research Council (ERC) and the Royal Society.

Antonella De Santo, who is also the EPP Group Leader, leads a substantial team working on the ATLAS experiment at the CERN Large Hadron Collider (LHC). The other ATLAS faculty members are Lily Asquith, Alessandro Cerri, Fabrizio Salvatore and Iacopo Vivarelli. The group has a long-standing leadership in the search for supersymmetry at ATLAS, and also leads in the areas of jet physics, Higgs physics, flavour physics, and top physics. Sussex also holds key responsibilities in the ATLAS High-Level Trigger (HLT) system,
including in view of future LHC and ATLAS upgrades. It also has a major role in the proposed Level-1 tracking trigger project, for use by ATLAS at the High-Luminosity LHC.

Sussex EPP also boasts a vibrant programme of neutrino physics. Sussex is one of the leading UK institutes involved in the SNO+ experiment, which seeks to determine whether the neutrino is its own antiparticle by searching for neutrino-less double-beta decays, and has strong involvement in the long-baseline neutrino programme (NOvA, DUNE). Simon Peeters leads the SNO+ effort and Jeff Hartnell the long-baseline neutrino programme. Other faculty members working on neutrino experiments are Lisa Falk and Clark Griffith.

Historically, the Sussex EPP is world-renowned for its high-precision measurement of the neutron electric dipole moment (EDM). The EDM is uniquely sensitive to physics beyond the Standard Model, and the group is currently involved in the neutron EDM experiment at the PSI. Philip Harris leads this effort at Sussex together with Clark Griffith and Visiting Researcher Mike Hardiman.

Sussex EPP have access to a number of well-equipped laboratories and enjoy good access to the University’s technical facilities, including shared technicians. Sussex EPP researchers have uncontended access to a dedicated Grid Tier-3 cluster, and Sussex is a member of the SouthGrid Tier-2 grouping of Grid-enabled research institutions in the South of England.

Sussex EPP has close links with colleagues in the Sussex Theoretical Particle Physics group (http://www.sussex.ac.uk/tpp/) and with other partners in the SEPnet consortium.
4. Job Description

CORE JOB DESCRIPTION

Job Title: Research Fellow, Experimental Particle Physics
Grade: Research Fellow I, Grade 7
School: MPS
Location: Physics & Astronomy
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. Postholders 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, if required.
3. To support and pursue the development of physics analyses within the Sussex Experimental Particle Physics (EPP) Group.
4. To assume a leading role on the searches for supersymmetry both within the EPP at Sussex and within the ATLAS collaboration at CERN.
5. To work in close contact with PhD students and give them guidance whenever appropriate.
6. To train or arrange the training of research staff and students.
7. To liaise with the technical staff within the University and externally, as and when required.
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. **Contribution to School & University**

   2.1 Attend and contribute to relevant School and project meetings.
   
   2.2 Undertake additional duties, as required by the Principal Investigator and/or Head of School.

3. **Teaching & Student Support**

   3.1 Undertake teaching duties, if required.
   
   3.2 Assist in the development of student research skills, for example as part of a postgraduate supervision team.
   
   3.3 Assist in the assessment of student knowledge and supervision of student projects if required.

4. **Role-specific duties**

   4.1 To assume a leading role in the data analysis activities of the Sussex ATLAS team, with particular emphasis on Supersymmetry searches at ATLAS.
   
   4.2 To coordinate and guide Sussex PhD students working on ATLAS.
   
   4.3 Provision of periodic progress reports as appropriate.
5. **Person Specification**

### SKILLS / ABILITIES

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<thead>
<tr>
<th>Essential</th>
<th>Desirable</th>
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<tbody>
<tr>
<td>PhD in Experimental Particle Physics or equivalent degree</td>
<td>X</td>
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<tr>
<td>Commitment to learning software skills when required, possibly by attending appropriate training</td>
<td>X</td>
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<tr>
<td>Excellent organisational and administrative skills</td>
<td>X</td>
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<tr>
<td>Excellent communication skills, both spoken and written</td>
<td>X</td>
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<td>High level of numerical and literary skills</td>
<td>X</td>
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<td>Ability to prioritise and meet deadlines</td>
<td>X</td>
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<tr>
<td>Ability to collaborate openly and to work in international multi-disciplinary research teams</td>
<td>X</td>
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<tr>
<td>Experience in the analysis of data from a large-scale particle physics experiment</td>
<td>X</td>
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<td>Experience in the development of analyses for supersymmetry searches at colliders</td>
<td>X</td>
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<tr>
<td>Demonstrated initiative and creativity in developing an existing experimental programme</td>
<td>X</td>
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<tr>
<td>Evidence of successful engagement in teaching and/or the supervision of students</td>
<td>X</td>
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<tr>
<td>Experience of generating research or knowledge exchange income</td>
<td>X</td>
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### KNOWLEDGE

<table>
<thead>
<tr>
<th>Essential</th>
<th>Desirable</th>
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<tbody>
<tr>
<td>Excellent programming knowledge: C++, Python, Linux</td>
<td>X</td>
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<tr>
<td>Knowledge of the most common analysis tools used in LHC experiment (ROOT, RooFit)</td>
<td>X</td>
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<tr>
<td>Excellent knowledge of the most common supersymmetric models</td>
<td>X</td>
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</table>
Previous significant contributions to physics analysis at colliders | X |
---|---|
Grid experience | X |
Detailed knowledge of the ATLAS software framework | X |
Detailed knowledge of LHC physics | X |

**PERSONAL ATTRIBUTES AND CIRCUMSTANCES**

<table>
<thead>
<tr>
<th>Essential</th>
<th>Desirable</th>
</tr>
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<tbody>
<tr>
<td>Willing and able to travel to CERN and to other locations in the UK and abroad, including for extended periods of time, as required</td>
<td>X</td>
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<tr>
<td>Willing and able to carry out a limited amount of work in radiation protected zones if necessary</td>
<td>X</td>
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<tr>
<td>Willing to relocate in an area within 20 miles distance from the university (unless temporarily based at CERN)</td>
<td>X</td>
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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.