

Post Details		Last Updated: 19/09/2019	
<b>Faculty/Administrative/Service Department</b>	Faculty of Engineering & Physical Sciences (FEPS) Department of Physics		
<b>Job Title</b>	Research Software Developer (Experimental Officer)		
<b>Job Family</b>	Technical and Experimental	<b>Job Level</b>	4
<b>Responsible to</b>	Professor in Physics		
<b>Responsible for (Staff)</b>	n/a		
<b><u>Job Purpose Statement</u></b>			
<p>The role provides technical software support to all computational and data science groups within the Physics Department. This is a vital role for our world leading computational physics research in astrophysics, nuclear physics, soft matter and photonics/quantum sciences. It allows us to develop world leading software, making better use of in-house resources, and leveraging access to the largest computational facilities in the UK, Europe and worldwide. The post also drives research impact through the use of open source software, and through the delivery of key projects with industry partners.</p> <p>The post holder undertakes the development of research software frameworks, components, and demonstrators in connection with our physics research programme. This includes code development and optimisation for parallel and GPU architectures, the development of exciting new algorithms to drive and grow research capacity, and the delivery of novel software solutions to outstanding research problems. The role will also assist and advise postdoctoral students, research fellows and staff with research software development.</p>			
<b><u>Key Responsibilities</u></b>			
<ol style="list-style-type: none"> <li>1. Design, develop and release extensible research software and data frameworks to support our Physics research goals.</li> <li>2. Design, develop and release technology demonstrators in collaboration with industry partners.</li> <li>3. Assist, advise and support postdoctoral students, research fellows and staff with aspects of their research projects related to software and data.</li> <li>4. Assist research groups and individual researchers with publishing and presenting research in high-quality international journals and conferences.</li> <li>5. Promote the research and activities of the physics Department in national and international forums.</li> </ol> <p><b>N.B. The above list is not exhaustive.</b></p>			
<b>All staff are expected to:</b>			
<ul style="list-style-type: none"> <li>• Positively support equality of opportunity and equity of treatment to colleagues and students in accordance with the University of Surrey Equal Opportunities Policy.</li> <li>• Work to achieve the aims of our Environmental Policy and promote awareness to colleagues and students.</li> <li>• Follow University/departmental policies and working practices in ensuring that no breaches of information security result from their actions.</li> <li>• Ensure they are aware of and abide by all relevant University Regulations and Policies relevant to the role.</li> <li>• Undertake such other duties within the scope of the post as may be requested by your Manager.</li> <li>• Work supportively with colleagues, operating in a collegiate manner at all times.</li> </ul>			
<b>Help maintain a safe working environment by:</b>			
<ul style="list-style-type: none"> <li>• Attending training in Health and Safety requirements as necessary, both on appointment and as changes in duties and techniques demand.</li> <li>• Following local codes of safe working practices and the University of Surrey Health and Safety Policy.</li> </ul>			
<b><u>Elements of the Role</u></b>			
<b><u>Planning and Organising</u></b>			
<ul style="list-style-type: none"> <li>• The post holder will be primarily a technical expert but will be required to demonstrate good project management skills within a technical environment.</li> <li>• The post holder will plan and organise the technical software development to ensure alignment with evolving research and development requirements.</li> </ul>			

### **Problem Solving and Decision Making**

Resolving potential conflicts in individual software projects to maintain alignment with overall strategy to research new signal processing methods. This will potentially require resolution of significant technical issues whilst recognising and being sensitive to other project pressures.

- The post holder is expected to operate with a degree of autonomy within their defined project area, with minimum referral to Principle Investigators.
- The ability to resolve internal resource and technical issues whilst maintaining positive external relationships is a part of the role.
- The post holder may work on original research tasks with colleagues in other institutions.

### **Continuous Improvement**

- The post holder will carry out the development of research software frameworks, and the work associated with the relevant software, to maintain quality of outputs, and to provide a basis for the project to deliver the project requirements for the University and its partners.

### **Accountability**

- The post holder will provide advice and solutions for routine day-to-day problems in their specialist technical area in which they are familiar. The appropriate course of action will usually be a matter of choice, influenced by the application of established procedures and precedents and their previous experience/exposure to similar problems.
- The post holder is required to identify and address the majority of these problems/issues with minimal guidance from their line manager; however, more complex problems should be referred up, either for advice/guidance or for resolution.
- The post holder does not have any budgetary or supervisory responsibility.

### **Dimensions of the role**

The post holder is expected to develop open-source research software and data tools and frameworks, including existing state-of-the-art methods, and incorporating the outcomes from project research outputs as the project develops. These frameworks will enable large-scale research in key areas of our physics research programme, including but not limited to: astrophysics, nuclear physics, soft matter and photonics and quantum sciences. Unless restricted by key project partners, all software will be made available to the wider community to encourage and support other UK and international researchers and to ensure “reproducible research”. The post holder may also be expected to develop “technology demonstrators” to showcase potential applications.

The post holder will work alongside academic staff to assist with the running and development of computationally intensive student research projects.

## **Person Specification**

### **Qualifications and Professional Memberships**

A Masters degree in Electronic Engineering, Computer Science or equivalent professional experience in a relevant discipline, with required skills based on a number of years experience in relevant fields.

E

**Technical Competencies (Experience and Knowledge)** This section contains the level of competency required to carry out the role (please refer to the Competency Framework for clarification where needed and the Job Matching Guidance).

**Essential/  
Desirable**

**Level  
1-3**

Demonstrable experience in software development relevant to high performance computational physics.

E

3

Experience in software development in one or more of the following topics: computational fluid dynamics, N-body methods, density functional methods, lattice QCD, Monte-Carlo methods, machine learning, optimisation, large scale data mining.

E

2

Skills and experience in developing new algorithms

E

3

Direct research experience in computational astrophysics, nuclear physics, fluid dynamics or quantum physics.

D

n/a

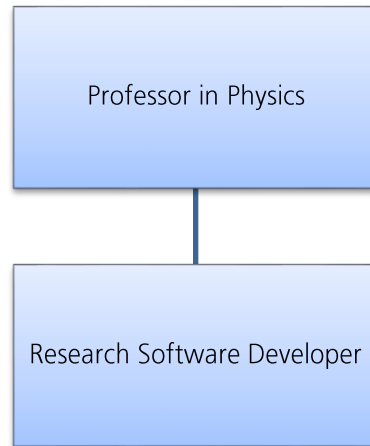
Significant software development experience (Python, C/C++, Fortran) is desirable.

D

n/a

Strong technical writing skills across different levels of technical audience.	D	n/a
<b>Core Competencies</b> This section contains the level of competency required to carry out this role. (Please refer to the competency framework for clarification where needed). n/a (not applicable) should be placed, where the competency is not a requirement of the grade.		<b>Level 1-3</b>
Communication		3
Adaptability / Flexibility		2
Customer/Client service and support		3
Planning and Organising		2
Continuous Improvement		2
Problem Solving and Decision Making Skills		3
Managing and Developing Performance		n/a
Creative and Analytical Thinking		3
Influencing, Persuasion and Negotiation Skills		2
Strategic Thinking & Leadership		1
<p>This Job Purpose reflects the core activities of the post. As the Department/Faculty and the post holder develop, there will inevitably be some changes to the duties for which the post is responsible, and possibly to the emphasis of the post itself. The University expects that the post holder will recognise this and will adopt a flexible approach to work. This could include undertaking relevant training where necessary.</p> <p>Should significant changes to the Job Purpose become necessary, the post holder will be consulted and the changes reflected in a revised Job Purpose.</p>		
<b>Organisational/Departmental Information &amp; Key Relationships</b>		
<p><b>Background Information</b></p> <p>The Department of Physics hosts several groups working at the cutting edge of computational physics. The astrophysics group develop novel methods to simulate gravitational systems and to mine and model "big data" from large surveys (e.g. Gaia, WEAVE, LSST and SKA). The photonics group develop methods to model novel photonic materials, with applications ranging from quantum computing to secure data transmission. The nuclear physics group model the structure of heavy elements and isotopes to understand the nature of the strong force. And the soft matter group model complex fluids and how they interact with porous media.</p>		

### **Department Structure Chart**



### **Relationships**

It is key that the post holder has the ability to design, develop and test software systems and to facilitate the undertaking and communication of research.

#### **Internal**

- The post holder will have direct responsibility to the Principal Investigator or Academic Supervisor. They may be asked to serve on a relevant Faculty committee.
- The post impacts on the project team (Principal Investigator, Co-Investigators, and postdoctoral research fellows) in the Physics Department.
- The post holder will communicate with undergraduate, taught and research-postgraduate students and staff from a wide range of disciplines. They may also be a co-author on conference and/or journal publications from the project, and may give presentations or tutorials at national or international conferences and workshops.

#### **External**

- The post holder may be expected to work with external academic and industry partners.
- There may be additional reporting and liaison responsibilities to external funding bodies or sponsors.