

**Job Description: Research Software Engineer**

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| **College/School:** | **Science** |
| **Department/Subject:** | **Mathematics** |
| **Salary:** | **£39,105–£45,163 per annum together with USS pension benefits** |
| **Hours of work:** | **35** |
| **Contract:** | **This is initially a fixed term position until 30/09/2026, with the possibility of extension subject to availability of funding** |
| **Location:** | **This position will be based at the Bay Campus** |

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| **Introduction** | The Swansea Academy of Advanced Computing (SA2C) supports scientific research computing across Swansea University. Formed in 2017, it hosts the SUNBIRD and AccelerateAI computational facilities. Projects supported by the team include the ExCALIBUR-funded EXALAT and ExaTEPP initiatives, which are preparing the Lattice Field Theory and Particle Physics Experiments communities in the UK for the availability of Exascale computing resources; the work of the Swansea University Medical School on modelling and responding to the COVID-19 pandemic in Wales; and the Supercomputing Wales programme, Wales’s national research facility. SA2C is looking to recruit a Research Software Engineer to join this team, initially to support the technical work enabling the formation of a Collaborative Computational Project in Theoretical and Experimental Particle Physics, and to support the work of Dr Ed Bennett’s Research Software Engineering Fellowship. |
| **Background information**  | The project to form a Collaborative Computational Project in Theoretical and Experimental Particle Physics (CCP-TEPP) has been funded by CoSeC to:* Develop a five-year roadmap for the software supporting particle physics research in the UK
* Begin implementation of parts of this roadmap, in coordination with CoSeC
* Update the roadmap based on the outcome of the implementation phase

The STFC Research Software Engineering Fellowship on *Reproducible analysis frameworks in Lattice Field Theory and STFC-enabled computational research in Wales* is held by Dr Ed Bennett at the Swansea Academy of Advanced Computing, Swansea University. The aims of this fellowship are:* To formulate a set of best practices for reproducibility of analyses in lattice field theory (LFT)
* To develop a set of common tools that makes these practices simple enough to follow that it is harder to not do so
* To integrate these tools into the research workflows of LFT researchers at Swansea University and elsewhere
* To support researchers and RSEs in the Solar System Physics group at Aberystwyth University in moving their software from the Interactive Data Language (IDL) to Python
* To support researchers working with the LIGO scientific collaboration at the Gravity Exploration Institute at Cardiff University in improving the performance of their analyses
* To train researchers at Swansea University on reproducible data analysis and related research software techniques
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| **Main Purpose of Post:**  | The successful applicant will support the Research Software Engineering efforts at SA2C and within the Faculty of Science and Engineering. In the first instance this will support both the project to form CCP-TEPP and the Fellowship project of Dr Ed Bennett. This will include:1. Performing technical interventions on software used for lattice quantum field theory research in the UK
2. Developing and/or deploying computational infrastructure to support the reproducibility efforts of the TELOS collaboration
3. Supporting the development and dissemination of best practices in reproducibility and openness for lattice quantum field theory research

It is anticipated that they will also have the opportunity to work on other funded projects supported by SA2C, contributing to the long-term sustainability of the team and the post. |
| **General Duties** | 1. Pro-actively contribute to and conduct the development of research software, exhibiting a degree of independence in terms of specifying the exact methodology to be applied, while following good research software engineering principles and practices.
2. Support other members of the RSE team in doing the same, including through code reviews, offering advice, and sharing best practices.
3. Be self-motivated, apply and use initiative, aiming to determine suitable ways to tackle challenges and seeking guidance when needed, and adapting in response to feedback when it is received.
4. Interact positively and professionally with other collaborators and partners within the College, elsewhere in the University and beyond both in industry/commerce and academia.
5. Participate in broader SA2C activities, including events for knowledge exchange and outreach.
6. Support and contribute to the preparation of reports, funding applications, journal and conference papers, and other academic outputs.
7. Contribute to SA2C organisational matters in order to help it run smoothly and to help raise its external profile.
8. Keep informed of developments in research software engineering, including both practices and techniques directly applicable to current projects, and developments in the field as a whole.
9. When requested act as a representative or member of committees, using the opportunity to extend own professional experience.
10. Demonstrate and evidence own professional development, identifying development needs with reference to the Vitae Researcher Development Framework and other relevant professional development frameworks, particularly with regard to probation, performance reviews, and participation in training events.
11. Maintain and enhance links with the professional institutions and other related bodies.
12. To promote equality and diversity in working practices and maintain positive working relationships.
13. To conduct the job role and all activities in accordance with safety, health and sustainability policies and management systems, in order to reduce risks and impacts arising from the work activity.
14. To ensure that risk management is an integral part of any decision making process, by ensuring compliance with the University's Risk Management Policy
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| **Person Specification** | **Essential criteria:** 1. A PhD in lattice quantum field theory, or equivalent experience in contributing to research in this area
2. Experience of software development in C or C++, and in Python
3. Experience of running software on high-performance computing systems
4. Familiarity with good practice in research software engineering (e.g. unit testing, continuous integration)
5. Experience of one or more of the areas:
	* Contributing to open source community software
	* Making use of workflow management frameworks (e.g. Apache Airflow, Luigi)
	* Publishing FAIR research data and software
6. Willingness to travel to a range of events (adjustments in line with DDA will be considered where appropriate).
7. A commitment to continuous professional development.

**Desirable Criteria**1. Experience of designing or developing libraries or frameworks used by others
2. Experience of parallel programming, e.g., using MPI, OpenMP, CUDA, or SYCL
3. Experience of providing training on computational techniques (e.g. Software Carpentry)
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| **Additional Information** | Informal enquiries: Dr Ed Bennett (e.j.bennett@swansea.ac.uk) Shortlisting Date: Interview Date |

  