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Research Associate

Department/Division/Faculty:	Faculty of Engineering, Department of Earth Science and Engineering
Campus/Location:	South Kensington
Job Family/Level:	Research Job Family, Research Associate* (Research salary scale)
Responsible to:	Prof. Christopher Pain
Line management for:	
Key working Relationships (Internal):	Prof Christopher Pain and other members of the project team and Research Group
Key Working Relationships (External):	Project Sponsor
Contract type:	Up to 36 months, depending on salary, (with possibility of 1 year extension)

Purpose of the Post

We have a number of positions available in the Applied Computation and Modelling Group (AMCG) which Prof Pain leads.

Successful candidates will carry out research focussed on the application of reactor physics, neutronics and fuel cycle modelling methodologies to the design and optimisation of a novel thorium reactor. The posts are funded by industry to develop an integrated digital engineering platform for the design, validation, manufacture and operation of compact nuclear reactor systems. They will bring reactor physics, scientific computing and AI expertise to a multidisciplinary team developing next-generation nuclear technology, applying neutronics, fuel cycle and burnup/depletion modelling to help design and optimise the reactor of tomorrow.

These methods may also be applied to a project developing an agentic digital ecosystem ranging from discretised physics-based approaches to data-driven methods that will support the entire nuclear system lifecycle, supported by UKRI funding. Within this framework, critical decisions (from reactor core design and regulatory approval, through safe and reliable operation, to decommissioning and waste management) will be assessed rapidly using explainable, physics-based models with quantified uncertainty. The programme of work has a particular emphasis on next-generation High-Temperature Gas-Cooled Reactors (HTGRs).

Up to five positions are available, and we encourage applicants across a wide range of fields including reactor physics, applied mathematical modelling, computational mathematics and AI methods to consider applying.

The Research Associate will be expected to submit publications to refereed journals and to attract external research funding.

Key Responsibilities

Research Duties:

- To undertake internationally leading research into the development of advanced reactor physics and fuel cycle modelling techniques for novel reactor designs.
- To plan and carry out research in accordance with the project aims and under instruction from the project investigators
- To take initiatives in the planning of research
- To direct the work of small research teams
- To identify and develop suitable techniques, and apparatus, for the collection and analysis of data
- To conduct data analysis
- To ensure the validity and reliability of data at all times
- To maintain accurate and complete records of all findings
- To write reports for submission to research sponsors
- To present findings to colleagues and at conferences
- To submit publications to refereed journals
- To provide guidance to staff and students
- To attend relevant workshops and conferences as necessary
- To develop contacts and research collaborations within the College and the wider community
- To promote the reputation of the Group, the Department and the College
- To provide guidance to PhD Students
- Contribute to bids for research grants
- To conduct and plan own scientific work with appropriate supervision.
- To maintain highly organised and accurate record of numerical/computational work
- To actively participate in the research programme of the Group
- To publish in high quality journals and to present data at national and international meetings
- To participate in Group research meetings and internal seminars
- To collaborate with other allied scientists within Imperial College and elsewhere in London and abroad, as appropriate
- To contribute to the smooth running of the Group's laboratories and, facilities with other scientists, clinicians, technicians and students within the laboratories
- Assist in the supervision of undergraduate and postgraduate research students and research assistants as required
- To comply with the College, Division, and Unit safety practices and to attend courses on safety when appropriate

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- Any other duties as may be deemed reasonable by Head of group as well as Head of Division/Department/Section

Other Duties:

- To undertake any necessary training and/or development
- To undertake appropriate administration tasks
- To attend relevant meetings

Where Imperial or funder conditions necessitate, you will be required to complete timesheets for your work on projects in a timely manner.

Person Specification

Requirements	Essential (E)/ Desirable (D)
Candidates/post holders will be expected to demonstrate the following:	
Education	
Hold a PhD in Nuclear Engineering, Physics, Applied Mathematics or a closely related computational discipline or equivalent research, industrial or commercial experience	E
<i>*Candidates who have not yet been officially awarded their PhD will be appointed as Research Assistant.</i>	
Experience	
Practical experience within a research environment and / or publication in relevant and refereed journals	E
Experience of dealing with industry partners and project sponsors	E
Experience developing software which implements discretisation methods such as FEM/FV	E
Experience producing reduced order models from physics data with AI techniques, such as neural networks	D
Practical experience in a broad range of techniques including reactor physics/neutronics codes (e.g. WIMS, OpenMC, Serpent, MCNP, CASMO/SIMULATE, SCALE or PANTHER), fuel cycle and burnup/depletion calculations	D
Experience producing condensed or homogenised cross-sections for reactor-physics problems	D
Experience modelling breeding/fission by-products (e.g., with FISPIN)	D
Scientific programming in Fortran, C/C++ or Python	E
Experience developing and deploying scientific codes to HPC environments, including multi-GPU clusters	D

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Experience applying optimisation methods to reactor design or fuel cycles problems	D
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Knowledge

Knowledge of reactor physics and nuclear fuel cycles	D
Knowledge of research methods and statistical procedures	E
Knowledge of advanced/Generation IV reactor concepts (e.g. thorium, molten salt, fast or high-temperature gas-cooled reactors)	D

Skills & Abilities

Ability to conduct a detailed review of recent literature	E
Ability to develop and apply new concepts	E
Creative approach to problem-solving	E
Excellent verbal communication skills and the ability to deal with a wide range of people	E
Excellent written communication skills and the ability to write clearly and succinctly for publication	E
Ability to organise own work with minimal supervision	E
Willingness to work as part of a team and to be open-minded and cooperative	E
Ability to prioritise own work in response to deadlines	E
Ability to direct the work of a small research team and motivate others to produce a high standard of work	E
Flexible attitude towards work	E
Discipline and regard for confidentiality and security at all times	E
Willingness to undertake any necessary training for the role	E
Willingness to travel both within the United Kingdom and abroad to conduct research and attend conferences	E
Willingness to work out of normal working hours (including weekends) should the requirements of the project occasionally demand this	E

Further Information

Please note that job descriptions cannot be exhaustive, and the post-holder may be required to undertake other duties, which are broadly in line with the above key responsibilities.

[Our values](#) are at the root of everything we do and everyone in our community is expected to demonstrate Imperial:

- Respect

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- Collaboration
- Excellence
- Integrity
- Innovation

Employees are also required to comply with all Imperial policies and regulations.

We are committed to equality of opportunity, to eliminating discrimination and to creating an inclusive working environment for all. We encourage candidates to apply irrespective of age, disability, marriage or civil partnership status, pregnancy or maternity, race, religion and belief, gender reassignment, sex, or sexual orientation. You can read more about our commitment [on our webpages](#).

Imperial is a proud signatory to the San-Francisco Declaration on Research Assessment (DORA), which means that in hiring and promotion decisions, we evaluate applicants on the quality of their work, not the journal impact factor where it is published. For more information, see <https://www.imperial.ac.uk/research-and-innovation/about-imperial-research/research-evaluation/>

Imperial believes that the use of animals in research is vital to improve human and animal health and welfare. Animals may only be used in research programmes which are ultimately aimed towards finding new treatments and making scientific and medical advances, and where there are no satisfactory or reasonably practical alternatives to their use. Imperial is committed to ensuring that, in cases where this research is deemed essential, all animals in our care are treated with full respect, and that all staff involved with this work show due consideration at every level. [Find out more about animal research at Imperial](#).

September 2026