CANDIDATE BRIEF

Research Assistant or Fellow in Thermal Hydraulic Simulation of Departure from Nucleate Boiling, Faculty of Engineering and Physical Sciences

Salary: Grade 6 (£27,025 – £32,236p.a.) or Grade 7 (£33,199 – £39,609 p.a.) Due to funding restrictions an appointment will not be made above £33,199p.a.

Reference: ENGPE1171

Closing date: 27th August 2019

Fixed-term for up to 24 months

We will consider flexible working arrangements

Research Assistant or Fellow in Thermal Hydraulic Simulation of Departure from Nucleate Boiling
School of Chemical and Process Engineering

Are you an experienced and ambitious researcher looking for your next challenge? Do you have a background in the computational modelling of boiling flows? Do you want to further your career in one of the UK's leading research intensive Universities?

We are looking for a Research Assistant or Fellow to join our project, working on the development of heat flux partitioning models of boiling water and their incorporation within Reynolds-averaged; Navier-Stokes (RANS); Eulerian-Eulerian; two-fluid computational fluid dynamic models (CFD) of boiling flows for nuclear reactor applications. Extension of the boiling model will be carried to allow it to better handle departure from nucleate boiling (DNB), with the complete CFD model validated against measurements of DNB on a single rod and in rod bundles and against data on the passive cooling of the external surfaces of reactor vessels (external reactor vessel cooling). Allied predictions based on large eddy simulation (for Grade 7) will also be used to underpin further development of the RANS approach.

The work is funded by the EPSRC through a grant entitled 'Development and Validation of Thermal-Hydraulic Prediction Methods for Licensing, Fault Conditions and Severe Accidents in BWRs and PWRs' under Phase IV of the UK-India Civil Nuclear Collaboration. The project is in collaboration with colleagues at Imperial College London and the Bhabha Atomic Research Centre (BARC) in Mumbai. Overall, the project as a whole will acquire quality benchmark data and, through modelling improvements, increase our understanding of and ability to predict departures from nucleate boiling and boiling heat transfer, as needed in support of the development of advanced nuclear reactors and in the evaluation of passive reactor systems.

What does the role entail?

As a Research Assistant your main duties will include:
- Using data from BARC, and micro-scale modelling results from Imperial College London, to extend an existing macroscopic boiling model, based on heat flux partitioning, to cover departure from nucleate boiling prediction;

- Testing the derived model against available data, and embedding it in a RANS, Eulerian-Eulerian, two-fluid computational fluid dynamic model;
- Assessing the accuracy of the CFD model by comparison of its predictions with data on single tube and rod bundle boiling measurements;
- Further assessing the accuracy of the CFD model by comparison of its predictions with data on passive cooling of the external surfaces of reactor vessels;
- Making a significant contribution to the dissemination of research results by publication in leading peer-reviewed journals, and by presentation at international conferences;
- Working independently and as part of a larger team of researchers, both internally and externally, to develop new research links and collaborations and engaging in knowledge transfer activities where appropriate;

Additionally as Research Fellow your main duties will include:

- Incorporating the developed boiling model in a large eddy simulation code and using idealised flow predictions to underpin development of the RANS model;
- Contributing to the supervision of less experienced researchers and PhD students and acting as a mentor to less experienced colleagues;
- Contributing to the writing of innovative research grant proposals.

These duties provide a framework for the role and should not be regarded as a definitive list. Other reasonable duties may be required consistent with the grade of the post.

What will you bring to the role?

As a Research Assistant you will have:
- A 1st or upper second class degree in a relevant engineering or physical science subject;
- Experience in the development and use of in-house and/or commercial CFD codes, with advanced computing and programming skills;
- An understanding of, and ability to code, advanced modelling and simulation techniques for turbulent flows;
- An understanding of, and ability to code, advanced engineering models of two-phase flows, including boiling;

- Good interpersonal, communication, team working and time management skills, and an independent work ethic;

Additionally as Research Fellow you will have**:**

- A PhD (or close to completion) in a relevant field of science or engineering;
- A good knowledge of CFD, RANS and LES techniques, as well as two-phase flow, heat transfer and boiling flows;
- Evidence of having developed independent research skills, including some experience of project leadership;
- A publication record in high impact factor journals and international conferences;
- A track record in writing innovative research grant proposals.

At both grades you may also have:
- A willingness to work flexibly, where necessary, to fulfil the needs of the research work, including travel within the UK and internationally;
- A willingness to promote and contribute to a positive and nurturing environment for younger researchers within the School.

How to apply

You can apply for this role online; more guidance can be found on our How to Apply information page. Applications should be submitted by **23.59** (UK time) on the advertised closing date.

Contact information

To explore the post further or for any queries you may have, please contact:

Professor Michael Fairweather, Professor of Thermofluids and Combustion
Tel: 0113 343 2419
Email: m.fairweather@leeds.ac.uk

Additional information

Faculty and School Information

Further information is available on the research and teaching activities of the [School of Chemical and Process Engineering](#)

A diverse workforce

The Schools in the Faculty of Engineering & Physical Sciences are proud to have been awarded the Athena SWAN [Bronze](#) or [Silver](#) Award from the Equality Challenge Unit, the national body that promotes equality in the higher education sector. Our [equality and inclusion webpage](#) provides more information.

Working at Leeds

Find out more about the benefits of working at the University and what it's like to live and work in the Leeds area on our [Working at Leeds](#) information page.

Candidates with disabilities

Information for candidates with disabilities, impairments or health conditions, including requesting alternative formats, can be found on our [Accessibility](#) information page or by getting in touch with us at [disclosure@leeds.ac.uk.](#)

Criminal record information

Rehabilitation of Offenders Act 1974

A criminal record check is not required for this position. However, all applicants will be required to declare if they have any 'unspent' criminal offences, including those pending.

Any offer of appointment will be in accordance with our Criminal Records policy. You can find out more about required checks and declarations in our [Criminal Records](#) information page