

Research Associate in Air Quality and Air Flow Modelling

Requisition number: REQ250152

As part of the University's ongoing commitment to redeployment, please note that this vacancy may be withdrawn at any stage of the recruitment process if a suitable redeployee is identified.

About the School of Architecture Building and Civil Engineering

Research and teaching in the School of Architecture Building and Civil Engineering is driven by 80 academic staff, 34 technical and clerical support staff, 40 contract researchers and over 120 doctoral students. The School benefits by having academic staff from a wide variety of backgrounds, with a resulting rich diversity of perspectives. The undergraduate programmes include Architecture, Civil Engineering, Construction Engineering Management, Commercial Management and Quantity Surveying, Architectural Engineering and Design Management, Air Transport Management, and Transport and Business Management. In all courses, the academic content is directly aligned to the needs of the industry and there is a high level of sponsorship in our portfolio of programmes. Our record of graduate employment is second to none and we have been ranked 1st or 2nd in the National Student Survey for the last 6 years. Further information is available at: <http://www.lboro.ac.uk/departments/abce/>

The School of Architecture, Building and Civil Engineering delivers zero-carbon, resilient buildings, infrastructure and cities in a world under pressure from rising urban populations, ageing infrastructure, resource constraints and multiple hazards. In the 2021 Research Excellence Framework, Loughborough University ranked second place for Architecture, Built Environment and Planning and the research undertaken in the School was rated 'world-leading'.

The international standing of our research is exemplified by our growing portfolio of collaborations with other leading universities and research institutes worldwide. These include: the UNSW Sydney, University of California at Berkeley, MIT, Chongqing, Hong Kong, CEPT University India, RMIT and Penn State.

We are equally proud of our collaborations with industry such as Mace, Skanska, Aecom, Arup, Willmott Dixon, BRE, Anglia Water and many others, as well as influential organisations such as the Construction Leadership Council (CLC), Constructing Excellence, BSI and others. Built Environment research is increasingly informing government policy through, for example, the Department for Energy Security and Net Zero, and The Committee on Climate Change, and working with organisations such as the NHS, Network Rail and others.

For more on our research go to: <http://www.lboro.ac.uk/departments/abce/research/>

Project Description

The Covid-19 pandemic and other critical health conditions have put air quality firmly onto the agendas of government and professional bodies in the UK and worldwide. With it, the importance of ventilation and ventilation effectiveness have become a focus of attention.

The work undertaken by the Research Associate is not tied to a particular funding stream so the focus will be shaped by the skills and interests of the applicant, as well as the supervisors. It is expected that the successful candidate will use a combination of computational fluid dynamics, salt-bath modelling techniques and particle image velocimetry to work on several, linked projects, to investigate key aspects

of ventilation performance and indoor air quality.

Specific areas of interest to the team at Loughborough include: fresh air distribution, transmission of infectious diseases, health in schools and hospitals, and low energy ventilation techniques. The work will also involve investigation of fundamental fluid dynamics principles such as turbulence modelling, stratified flows, interaction of buoyant plumes, and droplet, particle and CO₂ transport.

The Research Associate will take a lead in defining each project and will be responsible for ensuring the successful delivery of outputs, including journal papers, conference presentations and technical papers for industry. The Associate will also be expected to contribute to future funding proposals, including externally funded fellowships.

Although based in the School of Architecture, Building and Civil Engineering, the work will be co-supervised by Dr Joshua Finneran in the Wolfson School of Mechanical, Electrical and Manufacturing Engineering offering the benefits of cross School and interdisciplinary collaboration.

Job Description

Job Grade: Specialist and Supporting Academic Grade 6

Job Purpose

To undertake numerical and experimental modelling work to investigate ventilation effectiveness and predict air quality for a range of energy efficient ventilation strategies in non-domestic buildings.

Job Duties

- To develop understanding of the ventilation effectiveness, air quality and advanced modelling techniques
- To establish experimental methods for evaluating low energy ventilation techniques.
- Write up regular progress reports and present outcomes to all Investigators and Collaborators.
- Prepare presentations both internally and to external stakeholders.
- To support the project team by enhancing relationships with existing collaborators and by assisting the establishment of relationships with new collaborators.
- To write research papers suitable for publication in high quality academic journals, plus industry guidance documentation.
- To attend and contribute to conferences.
- To contribute to project promotion and public engagement events.
- Contribute ideas for new research and enterprise directions.
- Maintain confidentiality at all times and ensure that intellectual property (IP) agreements are not violated.
- To assist the academic staff in the project team with the supervision of undergraduate MSc and PhD project work and day-to-day supervision and support of other researchers.
- Engage in training programmes in the University (or elsewhere) that are consistent with the needs and aspirations of the project and those of the Department.
- Undertake other duties as may be reasonably requested and that are commensurate with the nature and grade of the post.

Points To Note

The purpose of this job description is to indicate the general level of duties and responsibility of the post. The detailed duties may vary from time to time without changing the general character or level of responsibility entailed.

Special Conditions

All staff have a statutory responsibility to take reasonable care of themselves, others and the environment and to prevent harm by their acts or omissions. All staff are therefore required to adhere to the University's Health, Safety and Environmental Policy & Procedures.

All staff should hold a duty and commitment to observing the University's Equality & Diversity policy and procedures at all times. Duties must be carried out in accordance with relevant Equality & Diversity legislation and University policies/procedures.

Successful completion of probation will be dependent on attendance at the University's mandatory courses which include Respecting Diversity and, where appropriate, Recruitment and Selection.

Organisational Responsibility

Reports to Prof Malcolm Cook.

Person Specification

Your application will be reviewed with respect to meeting the essential and desirable criteria listed below. Your application will be reviewed against the essential and desirable criteria listed below. Applicants are strongly advised to explicitly state and evidence how they meet each of the essential (and desirable) criteria in their application. Stages of assessment are as follows:

- 1 – Application
- 2 – Test/Assessment Centre/Presentation
- 3 – Interview

Essential Criteria

Area	Criteria	Stage
Experience	Academic or Industrial Background in air flow modelling and analysis	1,3
	Authoring original work for academic journal papers, conference papers or technical reports	1,3
Skills and abilities	Ability to undertake the duties and responsibilities of the post	1,3
	Excellent written and oral communication skills	1,2
	Self-motivated with ability to meet deadlines	1,3
	Excellent interpersonal, and organisational skills	2,3
	Ability to write project reports and make technical presentations to industrial and academic research groups	1,2,3
Training	Willingness to undertake appropriate further training and to adopt new procedures as and when required	1,3
Qualifications	PhD (or near completion) in building physics or a relevant field	1
Other	Commitment to observing the University's Equal Opportunities policy at all times.	1,3

Desirable Criteria

Area	Criteria	Stage
Experience	Experimental or numerical modelling of buoyancy-driven natural ventilation	1,3
	Use of particle image velocimetry	1,3
	Developing proposals for funding from external agencies	1,3
	Working in a high-quality academic research environment	1,3
	Experience of teaching and / or supervision of students in relevant areas	1,3
	Design and operation of healthy buildings	1,3
Skills and abilities	Authoring original work, in the highest quality refereed academic journals	1
	A strong publication track record	1
Other	Travel / Able to travel Independently / Working patterns	1,3

Conditions of Service

The position is full-time and fixed term until July 2028. Salary will be on Specialist and Supporting Academic (Research) Grade 6 (£35,116 - £45,413) per annum, at a starting salary to be confirmed on offer of appointment.

The appointment will be subject to the University's Terms and Conditions of Employment for staff grade 6 and above, details of which can be found [here](#)-

The University is committed to enabling staff to maintain a healthy work-home balance and has a number of family friendly policies which can be found [here](#).

The University offers a wide range of employee benefits which can be found [here](#).

We also offer an on-campus nursery with subsidised places, subsidised places at local holiday clubs and a childcare voucher scheme (further details are available at: <http://www.lboro.ac.uk/services/hr/a-z/childcareinformation---page.html>)

In addition, the University is supportive, wherever possible, of flexible working arrangements. We also strive to create a culture that supports equity and celebrates diversity throughout the campus. The University holds a Bronze Athena SWAN award which recognises the importance of support for women at all stages of their academic career. For further information on Athena SWAN see <http://www.lboro.ac.uk/services/hr/athena-swan/>