Scalar Dispersion in Turbulent Flows for Air Pollution Applications

Type of award	PhD Research Studentship
Department	Aerospace Engineering Fluids and Aerodynamics Research Group
Scholarship Details	£17,668 p.a. in 2022/23 subject to eligibility and confirmation of award
Duration	3.5 years
Eligibility	Home / EU / International
Start Date	From September 2023

PhD Topic Background/Description

Air pollution is the biggest environmental risk to public health. The WHO estimates 7 million premature deaths worldwide due to air pollution annually, and in the UK, it is costing the economy £20bn with over 25,000 deaths annually. An improved understanding on scalar dispersion and turbulent mixing has far-reaching impact and can contribute to building ventilation designs, public health policies, city planning, legislation, etc. Apart from air pollution, turbulent mixing has a wide range of other engineering applications which include sediment transport in rivers, oil spill containment, urban heat island effect, film cooling of turbine blades, etc.

This is an experimental study that will focus on developing and utilising state-of-the-art experimental techniques to study the flow physics of turbulence and mass transport. More specifically, the student will make use of advanced optical-based diagnostics such as particle-image velocimetry and in-house particle tracer tracking techniques to measure the flow properties. This will offer valuable insights into the scalar fluxes and turbulent diffusivity of air pollutants in atmospheric and indoor flow applications. The outcome of the research is expected to benefit the wind engineering industry, government agencies such as PHE and city councils, as well as the wider academic community.

The student will work in the Hele-Shaw Boundary Layer Wind Tunnel which is a new national wind tunnel facility that has a 2m x 1m x 18m test section and is among the largest in the UK. The facility is well-equipped with state-of-the-art features and measurement suites which enables a range of research activities from applied aeroacoustics to wind engineering research. The student will integrate into the Fluid and Aerodynamics Research Group and work alongside Marie-Curie initiatives on urban air flow. The student will have the opportunity to interact with industrial and academic partners, disseminate key results in leading journals and national/international conferences.

Candidate Requirements

Applicants must hold/achieve a minimum of a Master's degree (or international equivalent) in a science, mathematics or engineering discipline. Applicants without a Master's qualification may be considered on an exceptional basis, provided they hold a first-class undergraduate degree. Please note, acceptance will also depend on evidence of readiness to pursue a research degree.

Experience with programming languages e.g Python, C++ and CAD design software e.g Solidworks is desirable.

If English is not your first language, you need to meet this profile level:
Profile E
Further information about English language requirements and profile levels.

Scholarship Details

Stipend at the UKRI minimum stipend level will also cover tuition fees at the UK student rate. Funding is subject to confirmation of eligibility and award.

For eligibility and residence requirements please check the UKRI UK Research and Innovation website.

Enquiries

For questions about the **research** topic please contact Dr Desmond Lim

For questions about **eligibility and the application** process please contact came-pgr-admissions@bristol.ac.uk

Application Details

To apply for this studentship, submit a PhD application using our online application system [www.bristol.ac.uk/pg-howtoapply]

Please ensure that in the Funding section you tick "I would like to be considered for a funding award from the **Aerospace Engineering** Department" and specify the title of the scholarship in the "other" box below with the names of the supervisor.

Interested candidates should apply as soon as possible.

Closing date for applications: **31 August 2023**