

Imperial College London

Departments of Aeronautics

PhD Studentship

Fluid Mechanics (AE0041)

Applications are invited for a Ph.D. studentship in the Departments of Aeronautics. The successful candidate will have the opportunity to conduct cutting-edge research in the field of fluid mechanics.

There are two potential topics in this post, and the PhD dissertation topic will be finalised after a discussion with the potential supervisor, Dr Yongyun Hwang:

- 1) **Thermal convection with cross flow:** This project will be exploring transition from spiral defect chaos observed in thermal convection to shear flow turbulence. Direct numerical simulation will first be involved, after which bifurcation and stability analysis of invariant solutions will be the main tools. If time is permitted, reduced-order modelling will be involved in the late stage of the project.
- 2) **Stokesian dynamics simulation and continuum modelling of viscoelastic fluid:** The first part of this project will involve Stokesian dynamics simulations of dumbbell model for polymer and will compare it with the existing models. In the late stage of the project, there will be physics-informed data-driven efforts of continuum modelling of the simulated model flow, with potential applications to the development of a new model for viscoelastic fluids.

Applicants should have a strong background in fluid mechanics, mathematics and scientific computing. Knowledge of transition, dynamical systems and optimisation (including machine learning) will be a plus. The applicants should also have a proven aptitude or willingness to conduct theoretical/computational work and a genuine passion for research. Applications are invited from candidates who possess (or expect to gain) a first-class honours MEng or higher degree or equivalent in Engineering, Applied Mathematics and Physics. The successful candidate will also be expected to submit publications to academic journals and to present their findings at major international conferences.

The deadline for the application is 31st of January, 2024.

Imperial College is consistently ranked as one of top universities in the world and top 3 universities within the UK. In 2019/20 Imperial ranked 9th in the world in the QS and 10th in the world in the THE rankings. It has been ranked as the most innovative university in Europe. Imperial staff and alumni include 15 Nobel laureates, 2 Fields Medalists, 70 Fellows of the Royal Society, 82 Fellows of the Royal Academy of Engineering and 78 Fellows of the Academy of Medical Sciences. There will also be collaboration opportunities with colleagues from the University of Oxford and the University of Bristol.

This studentship is available for students eligible for home fees initially. Information on fee status can be found at <https://www.imperial.ac.uk/study/pg/fees-and-funding/tuition-fees/fee-status/>

The studentship is for 3.5 years and will provide full coverage of tuition fees and an annual tax-free stipend of £19,668.

Start date: October 2024, with flexibility.

For informal enquiries, you can contact Dr Yongyun Hwang (y.hwang@imperial.ac.uk).

To apply <https://www.imperial.ac.uk/study/pg/apply/how-to-apply/>).

For queries regarding the application process, please contact Ms Lisa Kelly
l.kelly@imperial.ac.uk

Imperial College is committed to equality and valuing diversity. We are an Athena Silver SWAN Award winner and a Stonewall Diversity Champion.