**Imperial College London**

**Departments of Aeronautics**

PhD Studentship

Application deadline: 29th May 2024

Start date: October 2024 (flexible)

Understanding and modelling accidental hydrogen explosions (AE0048)

Applications are invited for a Ph.D. studentship in the Departments of Aeronautics. The research project will be supervised by Dr V.L. Tagarielli and Prof F. Montomoli and it will involve collaboration with Baker Hughes (Florence, Italy) and the Brahmal Vasudevan Institute for Sustainable Aviation. The project’s objective is to facilitate the adoption of hydrogen as a fuel, by enhancing the safety of industrial operations involving this highly explosive gas.

The aim of the research is to develop experimental observations, analytical models and numerical predictions of hydrogen deflagration and of its effects on the surrounding environment. We will study such events in open or enclosed geometrically complex and congested environments, representative of typical industrial operations. We will explore the possible transition of deflagration to detonation and model it analytically and numerically. The project will aim at establishing a detailed understanding of hydrogen deflagration and at providing industrial designers with tools for both the rapid quantitative assessment of deflagration-related risks but also for the detailed and accurate simulation of complex explosion events in large and geometrically complex environments. The student will use existing CFD techniques in OpenFOAM to conduct deflagration analyses and apply machine learning to CFD-generated datasets.

The ideal applicant is a fresh graduate in engineering or in a closely related discipline, with a track record of achievements at the top of their cohorts. Academic excellence will be the primary selection criterion. Expertise in theoretical and computational fluid or solid mechanics, numerical methods, computing and machine learning will be advantageous.

The position will remain open until a suitable pool of candidates is identified; it is therefore important to apply as soon as possible. Interested applicants are invited to send a preliminary application via e-mail to v.tagarielli@imperial.ac.uk, highlighting how they meet the selection criteria and including a CV, university transcripts (or a list of modules taken and corresponding grades) and, optionally, a piece of written work (for example a previous project report). Shortlisted candidates will be invited to participate in a remote, day-long assessment involving the completion of a research assignment. The assessment will be followed by a final interview with the project supervisors.

**Funding**

This studentship is for 3.5 years and will provide full coverage of tuition fees and an annual tax-free stipend of approximately £20,622 for Home, EU and International students.

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