

**Three PhD Studentships on Sustainable Aviation**

Eligibility: Home/International candidates with (or who are expected to gain) a first-class honours degree or equivalent in a suitable field.

Deadline: **until filled**

Applications are invited for three Ph.D. studentships at the [Brahmal Institute](https://www.imperial.ac.uk/brahmal-institute), a collaborative research centre at Imperial College enabling blue-sky thinking to address adverse environmental impacts of aviation. The projects are cross-disciplinary and each researcher will work across two different departments within Imperial:

**Project 1: Climate effects on aviation turbulence. (CODE: BrahmalPhD23-1)**

*Department of Aeronautics and Grantham Institute of Climate Change*

Climate change brings new challenges in aircraft design as vehicles will need to be able to operate under increasingly adverse atmospheric conditions. This project will bring together the current knowledge in atmospheric sciences with state-of-the-art methods in flexible aircraft dynamics simulation and analysis. The project will produce a unique simulation environment to identify critical risks in aircraft performance and operations associated to the changes in weather patterns and atmospheric conditions, which may result in recommended mitigating actions and a roadmap for evolution of design rules for future-generation air vehicles.

**Project 2: Synthetic fuel design for minimal global impact (CODE: BrahmalPhD23-2)**

*Department of Civil and Environmental Engineering and Department of Chemical Engineering*

Sustainable Aviation Fuels (SAFs) that are compatible with today’s aircraft may be the most promising way to significantly reduce aviation CO2 emissions in the next couple of decades. SAFs can also significantly affect non-CO2 climate impacts associated with condensation trails (‘contrails’). This project will evaluate the potential of different SAFs and develop fuel designs and deployment strategies for minimum combined CO2 and non-CO2 impacts. It will investigate savings in CO2 emissions associated with SAFs resulting from lifecycle accounting of CO2 across the production of the fuel, analysing a wide variety of SAF feedstocks and supply chains, lifecycle CO2 emissions and non-CO2 impacts.

**Project 3: Design optimization of hydrogen fuel cell-powered aircraft (CODE: BrahmalPhD23-3)**

*Dyson School of Design Engineering and the Department of Aeronautics*

Hydrogen fuel cells have huge potential to power next generation aircrafts, however challenges remain around performance, lifetime and cost. Moreover, the integration of these power solutions on board air-vehicles introduces specific design challenges that require the development of novel power and thermal architectures and will impact both the configurations and operations of the future aircraft. This project will leverage multi-scale modelling approaches for hydrogen fuel cells towards an aircraft design optimization framework. Multifidelity and active learning methods for modelling and optimization will be considered to address the integrated design problem.

Applications are invited from candidates with (or who are expected to gain) a first-class honours degree or equivalent in a suitable field. The studentship is for 3.5 years and will provide full coverage of tuition fees, a travel budget and an annual tax-free stipend for Home, EU and International students.

To learn more about Imperial College, please go to [www.imperial.ac.uk/study/pg](http://www.imperial.ac.uk/study/pg). To apply , please go to <https://www.imperial.ac.uk/study/apply/postgraduate-doctoral/application-process/> and indicate in your application the reference code for the project(s) of interest. Please address your application to the Dept of Aeronautics. For further inquiries, contact us at brahmal-institute@imperial.ac.uk.

**Application REF: AE0038**

*Imperial College is committed to equality and valuing diversity. We are also an Athena SWAN Silver Award winner, a Stonewall Diversity Champion, a Disability Confident Employer and are working in partnership with GIRES to promote respect for trans people.*