

**Department of Mechanical Engineering
University of Sheffield**

PhD studentship - Flow laminarisation and drag reduction

Available from September 2019

Aerodynamic optimisation is of paramount importance in improving the design of aircrafts, automobiles as well as turbomachinery to reduce energy consumption and improve energy production efficiency. Recently it has been demonstrated numerically by researchers at University of Sheffield and experimentally by other research groups that a turbulent flow may be partially or fully laminarised through manipulation of its velocity profile, leading to significant drag reduction. This project is aimed at advancing this theory to better understand the flow laminarisation mechanisms and exploring a number of flow configurations to achieve effective flow laminarisation and drag reduction with minimal effort. The research will be carried out using advanced CFD, namely, direct numerical simulations (DNS), making use of high performance computing (HPC). It is planned that experiments will also be carried out using an existing test facility to verify and extend the numerical results. The test facility is equipped with advanced instrumentation including particle image velocimetry (PIV) and laser Doppler velocimetry (LDV) for velocity measurement and flush mount hot film anemometry for wall shear measurement.

Candidate Profile

The successful candidate should have or be expected to obtain a 1st class or a good 2.1 degree in mechanical or aerospace engineering, physics, applied mathematics or a related discipline.

A strong interest in fundamental/numerical research in fluid mechanics is essential. Previous knowledge in CFD and experience in programming languages (e.g. C, C++, Matlab, Python) are desirable but not essential.

Funding and Duration

A 3.5-year studentship is available to start in September 2019 (or as soon as possible after that) for applicants from the UK or EU with 3 years' residency in the UK. The studentship covers the cost of tuition fees and provides an annual tax-free stipend at the standard UK EPSRC rate (£14277 in 2018/19).

How to apply

For further information about this project, please contact Professor Shuisheng He, via s.he@sheffield.ac.uk.

To apply, please use our standard on-line PhD application form, including your CV and two references, and indicate on your form that you are replying to this advert. For further guidance on applying, please email me-pgadmit@sheffield.ac.uk.

Closing date: 4th August 2019.