Title: Applications of Acoustic Streaming – Developing a fundamental understanding of acoustic streaming and its use for flow manipulation and control

Type of award  PhD Research Studentship

Department  Mechanical Engineering

Scholarship  All fees paid at Home/EU rate, enhanced stipend and a generous expense allowance

Duration  4 years

Eligibility  Home / EU only

Start Date  As soon as possible

PhD Topic Background/Description

This is a 4-year ICASE PhD project with the Ultrasonics and Non-destructive Testing (UNDT) and Fluid and Aerodynamics groups at the University of Bristol sponsored by Dyson Technology. Dyson is well known for its flow control technology, both in confined (air flow through a vacuum cleaner) and open (air purification in a room) spaces. To maintain a market leading position, Dyson must develop new technology through investment in research. The purpose of this project is to develop a fundamental understanding of acoustic streaming for use in flow manipulation and control applications.

Acoustic streaming is a phenomenon whereby a flow field is generated in a fluid as a result of the nonlinear interaction of a high-pressure acoustic wave with the fluid medium. It is one of the two nonlinear phenomena that make up acoustophoresis (forces generated with sound), the other being the acoustic radiation force. The UNDT group have conducted extensive research in the use of ultrasound for manipulating particles using the acoustic radiation force. The project will build on this knowledge by incorporating acoustic streaming, specifically by developing an understanding of how acoustic driven streaming, solid surfaces and fluid flow interact with each other.

The student will be required to use the governing equations of acoustic streaming to conduct multiphysics modelling of a fully coupled acoustic/flow system. They will also be required to validate their work through experiment. The student will work closely with the aeroacoustic research group at Dyson, where they will be required to disseminate knowledge developed during their research to be used for the development of future technology and products. They will get the opportunity to spend time working at Dyson during their PhD and to use Dyson’s state-of-the-art laboratory and prototyping facilities.

Further Particulars

The studentship is offered through the FIND CDT which is a partnership between a select group of universities (Bristol, Manchester, Strathclyde, Nottingham, Warwick and Imperial College London) and companies offering a 4-year Engineering doctorate designed to launch outstanding graduates into an engineering career. With close links to the related UK Research Centre in NDE, students are part of a
vibrant community of more than 200 researchers and have access to a range of technical training courses delivered by world leading experts.

The post is supported by a bursary and fees (at the UK/EU student rate) provided by EPSRC, together with a generous top up by the sponsor company, Dyson.

**Candidate Requirements**
Applicants should have a 1st class or good 2.1 bachelor’s degree or master’s in engineering or physical science. In our experience the best candidates can use their knowledge to solve technical problems, are interested in useful research, are well-organised and are good communicators.

**Basic skills and knowledge required.**
An enquiring and rigorous approach to research together with a strong intellect and disciplined work habits. Good team-working, observational and communication skills are essential.

**Scholarship Details**
Scholarship covers full UK/EU (EU applicants who have been resident in the UK for 3 years prior to application) PhD tuition fees, a **tax-free** stipend plus an industry top-up subject to contracts and eligibility criteria.

Candidates can check the eligibility criteria for the award at [https://www.epsrc.ac.uk/skills/students/help/eligibility/](https://www.epsrc.ac.uk/skills/students/help/eligibility/)

**Informal enquiries**
For informal enquiries, please email Prof Anthony Croxford, A.J.Croxford@bristol.ac.uk or find-cdt@bristol.ac.uk

For general enquiries, please email came-pgr-admissions@bristol.ac.uk

**Application Details**
Prior to application Interested applicants should send an up-to-date CV to find-cdt@bristol.ac.uk.

To apply for this studentship submit a PhD application using our [online application system](http://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 Mechanical Engineering Department” and specify the title of the scholarship in the “other” box below with the name of the supervisor Prof Anthony Croxford.

**Apply now**