

IMPEE PhD Opportunity

Project title: Development of accurate and efficient solution for modelling real and complex flows in engineering

Supervisor(s): Dr Yeaw Chu Lee

Abstract:

The application of thin liquid films to and droplet flows on real and complex micro- and nano-patterned heterogeneous surfaces (man-made or naturally occurring) are found in many important physical and scientific areas. For example, such flows are important in:

- (i) engineering heat dissipation processes by controlling heat and mass transfer rates in heat exchanges;
- (ii) the micro- and nano-fabrication of flexible electronics exhibiting elasto-hydrodynamic response to solid-liquid interactions;
- (iii) rapid screening for infectious diseases in tissue engineering via toxicity monitoring.

To date, analytical and experimental methods alone have proved incapable of meeting the considerable challenges posed in unravelling the underlying physics involved or providing the necessary insight needed to improve thin film and droplet flows on existing man-made functional surfaces and lead to the design of new ones.

The project will focus on advancing the physics involved in modelling flow of thin liquid films and droplets along with the development of an efficient and accurate numerical predictive tool. This will be coupled with the exploitation of recent advances in the field, marrying state-of-the-art numerical methods with high performance computing facilities, to provide a step change in current predictive capabilities, revealing for the first time, the complex fluid dynamics underpinning micro- or nano-scale flows.

Requirement

Applicants with (or expected to obtain) a first or upper second class Degree or Masters in Engineering, Physics, Mathematics or a relevant subject area are invited to apply for a PhD studentship in Mechanical Engineering with a focus in Computational Engineering. Candidates with a keen interest in fluid dynamics, with good analytical and programming skills are encouraged to apply.

Other info:

To find out more or apply, please contact Dr Y.C. Lee at: y.c.lee@hw.ac.uk or visit the Computational Engineering Research (CER) group's webpage at: <http://cer.eps.hw.ac.uk>

UK, EU and International students are encouraged to apply. Applications are accepted all year round.

Self-funding Ph.D. students only.