

## **IMPEE PhD Opportunity**

Project title: Development of ultra-sensitive plasmonic substrates for bio-sensing applications.  
Supervisor(s): Dr Jining Sun

### **Abstract**

This project aims to research and develop ultra-sensitive bio-sensing chips based on 3D plasmonic structures.

3D plasmonic structures are key components in the development of sub-wavelength optical system for bio-sensing applications. In this system, the signals can be greatly enhanced by a phenomenon called surface plasmon resonance (SPR). Design and manufacture of the nanostructures array with carefully selected materials, which is able to stimulate a strong localized SPR, is crucial to the performance of bio-sensing chips for characterizing and quantifying biomolecular interactions. This interdisciplinary research lies at the interface of physical science, engineering and material science. It will explore design of novel 3D plasmonic structures through a Finite-difference time-domain (FDTD) method, and develop a hybrid nano-manufacturing technique for deterministic, robust and scalable production of the highly ordered diverse 3D nano-structure arrays over large area. The successful candidate will involve in all aspects of the bio-sensing chips including design, manufacture and characterization.

### **Requirement**

We are seeking an enthusiastic student with appropriate background and a good first degree (2.1 or 1st class honours) and/or an appropriate Masters level qualification in a relevant field such as physics, mechanical engineering, or material science. Critically, this research involves both very practical experimental aspects (micro-/nano-fabrication and characterization techniques) and theoretical considerations (FDTD simulation). Candidates with strong quantitative skills and a record of excellence in scientific publishing are especially encouraged to apply.

### **Other info**

Please email a CV, a cover letter describing research interests & experience, and the names and addresses of two referees to Dr Sun (Jining.Sun@hw.ac.uk).