



**Applications are invited for the following a PhD studentship for the following project:**

***Modelling electromechanical properties of two-dimensional materials and heterostructures***

This project will be based in the School of Physics and CRANN at Trinity College Dublin and co-supervised by **Prof. Stefano Sanvito** (Computational spintronics), **Dr. Nuala Caffrey** (Computational Materials research) and **Dr. Stephen Power** (Nanoelectronics theory). It will be part of the Theory and Modelling pillar of the Advanced Materials and Bioengineering Research Centre (AMBER) centre.

Summary of project

*2D materials such as graphene and transition metal dichalcogenides (TMDs) have been the focus of intense research in recent years due to their superlative electronic and mechanical properties. The interplay of mechanical and electronic properties is also important, and plays a key role for applications in flexible electronics, strain sensors and piezoelectric devices.*

*Recently, systems which combine different 2D materials in stacked and lateral heterostructures have been achieved, allowing for huge tunability of both their composition and properties. However, the role of strain in such systems is still largely an open question. This theoretical project will address the problem using a multi-scale approach, combining continuum mechanics, advanced electronic structure theory (density functional theory) and effective model approaches.*

*The project will address both naturally arising strains (e.g. lattice mismatch at interfaces) and deliberately engineered strains (e.g. AFM nano-indentation). The student will have the opportunity also to work with experimental groups at the AMBER centre who focus of the fabrication and characterization of such systems.*

The ideal applicants will have a 1<sup>st</sup> Class Honours Bachelor's degree in Physics, Chemistry, Materials Science or related disciplines.

The researcher will work closely with other members of a multidisciplinary project team. Excellent written and oral communication skills are essential.

How to apply:

CVs with the names and addresses of three referees should be submitted to:

*Dr. Stephen Power, [stephen.power@tcd.ie](mailto:stephen.power@tcd.ie)*

Please quote "AMBER 2D Electromechanical" on the subject line of your application.

Positions will remain opened until filled but preferred start date is [September 2 2019](#).

Only short-listed applications will be acknowledged.

This position is funded by the SFI-research centre AMBER.

The AMBER research centre, as a community of researchers, welcomes its responsibility to provide equal opportunities for all. We are actively seeking diversity in our research teams and particularly encourage applications from underrepresented groups.