Applications are invited for a three-year PhD studentship for the design of graphene solar cells is available at Imperial College London starting in October 2017.

Graphene is a unique material with many fascinating properties. For example, electrons in two-dimensional graphene sheets behave like massless Dirac fermions and exhibit ultrahigh mobilities. This makes graphene a promising candidate for a new generation of electronic nano-devices. In this PhD project, you will investigate the potential of graphene for applications in solar cell devices.

In particular, you will study tunnelling solar cells, which consist of a heterostructure composed of graphene, an ultrathin layer of an insulating material, such as an oxide or a nitride, and a semiconductor material. The semiconductor efficiently absorbs sunlight creating electron-hole pairs, which dissociate at the interface between the semiconductor and the insulating layer. Electrons can tunnel through the insulating layer to the graphene creating a current. Preliminary experiments on these systems indicate high energy conversion efficiencies, but a detailed understanding of the microscopic energy conversion mechanism is missing.

To gain insights, you will both manufacture and characterize graphene solar cells and also use cutting edge theoretical modelling approaches, ranging from atomistic density-functional theory calculations to analytical effective mass models, to understand the electronic and atomic structure of the relevant interfaces. In addition, you will collaborate with other researchers at the London Centre for Nanotechnology and the Thomas-Young Centre for Theory and Simulation of Materials.

Applicants should have a Master’s degree in Physics, Chemistry or Materials Science and a strong interest in both experiments and computer simulations. This project is well suited to a self-motivated student. You should also have excellent communication skills including proven ability to write in English.

We encourage informal enquiries about the project, which can be made to Dr. Johannes Lischner at j.lischner@imperial.ac.uk. Further information on the group's research interests can be found at https://sites.google.com/site/jlischner597/home.

This PhD studentship is funded by the UK's Engineering and Physical Sciences Research Council and is open to UK home students or European students who have spent the last three years in the UK. The studentship will cover tuition fees plus the standard maintenance stipend of £16,296 (this year’s rate) per annum.

How to apply
The prospectus, entry requirements and application form (under ‘how to apply’) are available at: http://www.imperial.ac.uk/pgprospectus.

Applicants should send a CV and covering letter to Dr. Johannes Lischner at j.lischner@imperial.ac.uk and will be required to complete an electronic application form. It is expected that the studentship will begin by 1 October 2017.

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Closing date: one month from placement

*Imperial Managers lead by example.*

Committed to equality and valuing diversity. We are also an Athena SWAN Silver Award winner, a Stonewall Diversity Champion, a Two Ticks Employer, and are working in partnership with GIRES to promote respect for trans people.