Applications are invited for a three-year PhD studentship in photoelectron spectroscopy of oxide heterostructures available at Imperial College London starting in October 2018.

Metal oxides are one of the top candidates to help us move from the silicon age into a new era of more powerful, energy efficient, and flexible electronics. They show the widest range of physical characteristics of any material family and in devices are often used in the form of thin films buried within layers of different materials. In this PhD project, you will investigate oxide materials for electronic devices using novel, advanced spectroscopy methods.

In particular, you will study the interfaces between oxides and adjacent layers of other oxides, metallisation layers, or dielectrics in heterostructures relevant to electronic devices both for applications such as memory and data storage, smart and wearable devices, and highly energy efficient power electronics. These interfaces determine the overall device behaviour and therefore it is of utmost importance to understand the local chemistry and physics. However, this is complicated as interfaces are not a simple combination of the properties of the single layers. At an interface, large numbers of completely new interactions are possible and many are still poorly understood. However, if oxides are to be successfully used in devices, we need to understand what is happening at these interfaces.

To gain insights into these interesting material structures, you will use highly advanced X-ray techniques, focusing primarily on hard X-ray photoelectron spectroscopy (HAXPES). This will involve the use of laboratory- as well as synchrotron-based facilities. The measurements will not only be limited to static investigations but will also include in-situ and in-operando exploration of devices under more realistic conditions.

Applicants should have a Master's degree or a First degree or (equivalent) with 1st Class or Upper Second Class in Physics, Chemistry or Materials Science and a strong interest in experiments in both laboratory environments as well as at national and international facilities. This project is well suited to a self-motivated student.

We encourage informal enquiries about the project, which can be made to Dr Anna Regoutz at a.regoutz@imperial.ac.uk. Further information on the area of research can be found at https://regoutz.wordpress.com/.

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 £16,553 (this year’s rate) per annum.

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 Anna Regoutz at a.regoutz@imperial.ac.uk and will be required to complete an electronic application form. The prospectus, entry requirements and application form (under ‘how to apply’) are available at: http://www.imperial.ac.uk/pgprospectus. Please contact Fiona Thomson (fiona.thomson@imperial.ac.uk). While information about the Department can be found at http://www3.imperial.ac.uk/materials.

Closing date: a month from placement (Midnight BST)

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

The College is a proud signatory to the San-Francisco Declaration on Research Assessment (DORA), which means that in hiring and promotion decisions, we evaluate applicants on the quality of their work, not the journal impact factor where it is published. For more information, see https://www.imperial.ac.uk/research-and-innovation/about-imperial-research/research-evaluation/