

JOB DESCRIPTION

Job title: Marie Curie Trainee (PhD Student) in Experimental Nanoscience

Job reference number: XXXX

Grade: UCL MCT, Salary Range: £22,888 - £27,608 (excluding London Allowance of £2,795)

Terms and Conditions: In accordance with the conditions of employment as laid down in the relevant UCL Staff policies

Reporting to: Professor Angelos Michaelides, London Centre for Nanotechnology & Department of Chemistry, UCL (angelos.michaelides@ucl.ac.uk)

Informal Queries to: Professor Geoff Thornton or Ms Denise Ottley (d.ottley@ucl.ac.uk).

General Introduction:

The London Centre for Nanotechnology (LCN) is the leading UK laboratory dedicated specifically to nanoscience research. We are participating in a recently funded Marie Curie Training Network (SMALL – www.small-itn.eu). As part of the SMALL network we are seeking a talented PhD student who will carry out cutting edge research in to the **structure of metal oxide interfaces with water. This PhD position comes with a considerably higher salary than a regular studentship and many opportunities for travel to the other European partners in the network.**

Metal oxide – water interfaces are incredibly important in our everyday life (e.g. corrosion) as well as in a number of emerging technologies such as light harvesting to produce H₂ as an alternative fuel. Nevertheless, an atomic level understanding of the key processes that limit performance is still lacking. To achieve this understanding will require the application of experimental and theoretical techniques that examine structures with atomic precision under realistic conditions, i.e. covered with liquid water. In this project surface X-ray diffraction and STM measurements of these interfaces will be performed. Specifically, the student will explore the structure of liquid water films on MgO and TiO₂. For TiO₂, surfaces have also been imaged with STM at atomic resolution and details of the reaction of the surfaces to water vapour in the low pressure regime explored [Thornton et al, Nature Materials 5 (2006) 189; Proc. Nat. Acad. Sci. 10 (2010) 2391].

This work will be done in close collaboration with a complementary theory project. The combination of theory and experiment will provide an unprecedented level of understanding of the specific water – oxide interfaces examined.

We are seeking a highly talented student with a high quality Masters degree in physics, chemistry or material science. The nature of this PhD position means that it comes with a **higher salary** than a standard PhD position. However, there are specific restrictions on eligibility. Specifically, researchers can be of ANY EUROPEAN nationality OTHER than British. Exceptions include those researchers with more than one nationality, in which case they are eligible if they have not resided in the UK for

the previous 5 years. Also eligible are those that have resided and worked for at least three out of the last 4 years in another country. Students must not have resided or carried out their main activity in the UK for more than 12 months in the last 3 years.

The functions of the job (PhD position) include:

- To carry out experimental research into water oxide interfaces.
- To operate, maintain and obtain data from UHV microscopes and diffractometers.
- To record, analyse and write up the results of these experiments.
- To contribute to the drafting and submitting of papers to peer reviewed journals.
- To contribute to the preparation of progress reports on research for funding bodies as required.
- To contribute to the overall activities of the research team and department as required.
- Responsible for ensuring that equipment is safe and maintained in working order.
- The post-holder will carry out any other duties as are within the scope, spirit, and purpose of the job as requested by Professor Geoff Thornton or his designees.
- Actively participate at group meetings, meetings with academic and non-academic collaborators.
- The postholder will actively follow UCL policies including Equal Opportunities and Race Equality policies.
- The postholder will maintain an awareness and observation of Fire and Health & Safety Regulations.
- As duties and responsibilities change, the job description will be reviewed and amended in consultation with the postholder.

University College London is committed to equality of opportunity and of eliminating discrimination. All employees are expected to adhere to the principles set out in its Equal Opportunities in Employment Policy, Promoting Race Equality policy and Disability Policy and all other relevant guidance/practice frameworks.

PERSON SPECIFICATION

Educational Qualifications

- Essential: MSc or equivalent in Physics, Chemistry, or Materials Science

Essential

- Strong background in Chemistry and Physics demonstrated by the successful completion of courses in e.g condensed matter physics, statistical mechanics, quantum mechanics, thermodynamics, chemical bonding.
- Good oral written and presentation skills.
- Experience of managing a research project and setting research targets.
- Excellent IT skills. Word processing such as MS-WORD or LATEX.

- Well-organised, attention to detail and ability to meet deadlines.
- Ability to think logically, create solutions and make informed decisions.

Desirable

- Experience with UHV surface science techniques.
- Experience with STM and or SXRD.

Personal

- Essential: Fluency and clarity in spoken English.
- Essential: Good written English.
- Essential: Ability to work collaboratively as part of a team.
- Essential: Commitment to high quality research.
- Essential: A commitment to work within the health and safety guidelines set down by the LCN safety officer and his designees.

London Centre for Nanotechnology

The London Centre for Nanotechnology, LCN, is a UK based multidisciplinary enterprise operating at the forefront of science and technology. It is a joint venture between University College London and Imperial College London and is based at the Bloomsbury and South Kensington sites. It has a unique operating model that accesses and focuses the combined skills of the departments of chemistry, physics, materials, medicine, electrical and electronic engineering, mechanical engineering, chemical engineering, biochemical engineering and earth sciences across the two universities.

The Centre occupies a purpose-built eight-storey facility in Gordon Street, Bloomsbury, as well as extensive facilities within different departments at South Kensington. LCN researchers have access to state-of-the-art clean-room, characterisation, fabrication, manipulation and design laboratories. This experimental research is complemented by leading edge modelling, visualisation and theory. LCN has strong relationships with the broader nanotechnology and commercial communities, and is involved in much major collaboration. As the worlds only such facility to be located in the heart of a metropolis LCN has superb access to corporate, investment and industrial partners. LCN is at the forefront of training in nanotechnology, and has a strong media presence aimed at educating the public and bringing transparency to this emerging science.

About UCL

Introduction: UCL is one of the UK's premier universities. It is a world-class research and teaching institution based in London whose staff and former students have included 19 Nobel Prize winners. Founded in 1826, it was the only university in England at that time which admitted students regardless of race or religion. UCL was also the first to admit women on equal terms with men. Today UCL is a friendly university in which to work and study and it continues to thrive on the diversity and creativity of its community.

UCL is in practice a university in its own right, although constitutionally a college within the federal University of London. With an annual turnover around £600 million, it is financially and managerially independent of the University of London.

The UCL community: UCL currently employs approximately 8,000 staff and includes academic units as diverse as the Slade School of Fine Art, the Bartlett School and the Institute of Child Health. In total, there are around 70 academic departments and institutes whose activities span the following: arts and humanities, social and historical sciences, law, architecture and the built environment, engineering, mathematical and physical sciences, life and clinical sciences, and medicine. UCL's academic and research staff are a truly international community with more than a quarter coming from 84 countries outside the UK. 12,000 undergraduates and 7,000 graduate students study at UCL, of whom over 25% come from 130 countries outside the UK. UCL offers 275 undergraduate programmes and more than 220 taught postgraduate programmes as well as the opportunity to carry out postgraduate research in all of its subjects.

Quality of UCL's teaching and research:

Two measures of the current quality of UCL's teaching and research are the results of the external teaching quality assessment reviews and the periodic Research Assessment Exercise (RAE).

During the teaching quality reviews conducted in the period 1993-2001, 75% of all reviews of UCL Departments resulted in ratings of 'excellent' (22+ points out of 24). Of these, four Departments received the maximum 24 points.

Thank you for your interest in this post and the London Centre for Nanotechnology at UCL.