

Title:	Research associate in modelling crystal growth
Reference:	1706584
Grade:	UCL Grade 7
Salary:	£34,635-£41,864 per annum including London Allowance
Terms and Conditions:	In accordance with the conditions of employment as laid down in the relevant UCL Staff policies
Accountable to:	Prof Dorothy Duffy

Job Summary:

Applications are invited for a postdoctoral position based in the London Centre for Nanotechnology and the Department of Physics and Astronomy in University College London. This position represents an exciting opportunity to join a consortium of groups whose objective is to develop new ways to control crystallisation by combining cutting-edge experiment and modelling to understand the mechanisms that determine how inorganic crystals nucleate and grow. The consortium on *Crystallisation in the real world: delivering control through theory & experiment* is funded by a significant EPSRC (Engineering and Physical Sciences Research Council) Programme Grant for five years, and involves the Universities of Leeds, Sheffield Warwick and UCL, together with international and industry partners.

The research associate at UCL will develop and apply methods for modelling the effects of additives on the growth of crystals from solution, with aim of developing a new framework for predicting the effects of additives on crystal growth and properties. The modelling studies will be pursued in tandem with complementary experimental work performed by researchers at the Universities of Warwick and Leeds. These studies will ultimately enable us to design smart surfaces that inhibit crystallisation (of importance in the scaling of oil wells, catheters, heating systems) or promote crystallisation (dental implants, surface coatings).

The position is ideal for a candidate with a strong background and interest in method development and long timescale simulations. It is funded for 2 years in the first instance.

Duties and Responsibilities:

- To contribute to the development of computer modelling methods for predictive simulations of crystal growth from solution.
- To model the effects of additives on crystal growth.
- To install, compile and successfully run computer modelling codes and materials science software on a wide variety of computing platforms.
- To write computer programs and add new functionality to existing codes.
- To record, analyse and write up the results of computer simulations.

- To collaborate with the experimental team on the design of joint experimental/modelling studies.
- To work towards establishing a theoretical framework to understand the effects of additives on crystal growth.
- To prepare progress reports and presentations on the research for progress meetings and the project sponsor as required.
- To contribute to the drafting and submitting of papers to peer reviewed journals.
- To contribute to the overall activities of the research team and department as required.
- To contribute to the induction and direction of other research staff and students as requested.
- As duties and responsibilities change, the job description will be reviewed and amended in consultation with the postholder.
- The postholder will carry out any other duties as are within the scope, spirit and purpose of the job as requested by the line manager or Head of Department/Division.
- 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.

Person Specification

Essential Qualifications

- A PhD in condensed matter physics, chemistry, material science or a closely related field

Essential Experience

- Knowledge and experience of molecular dynamics simulations of atomistic processes in solids and liquids
- Knowledge and experience of computational software for analysis of structural information
- Experience in programming with a variety of programming languages
- Experience of high performance computing on a range of architectures

Desirable Experience

- Experience in the use of Monte Carlo simulations
- Experience in developing and applying long timescale simulation methods
- Experience in the modification of the large scale molecular dynamics codes

Essential skills and abilities

- Ability for creative and original research as demonstrated by high quality publications
- Excellent programming and HPC skills
- Ability to work independently and organise work with minimal supervision
- Ability to work collaboratively and as part of a team
- Ability to deliver written reports to management and funding organizations
- Excellent written and spoken English.
- Commitment to UCL's policy of equal opportunity and the ability to work harmoniously with colleagues and students of all cultures and backgrounds

London Centre for Nanotechnology

The London Centre for Nanotechnology is an interdisciplinary joint enterprise between University College London and Imperial College London. In bringing together world-class infrastructure and leading nanotechnology research activities, the Centre aims to attain the critical mass to compete with the best facilities abroad. Research programmes are aligned to three key areas, namely Planet Care, Healthcare and Information Technology and exploit core competencies in biomedical, physical and engineering sciences.

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 world's 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

UCL is one of the world's top universities. Based in the heart of London, it is a modern, outward-looking institution. At its establishment in 1826, UCL was radical and responsive to the needs of society, and this ethos – that excellence should go hand-in-hand with enriching society – continues today.

UCL's excellence extends across all academic disciplines; from one of Europe's largest and most productive hubs for biomedical science interacting with several leading London hospitals, to world-renowned centres for architecture (UCL Bartlett) and fine art (UCL Slade School).

UCL is in practice a university in its own right, although constitutionally a college within the federal University of London. With an annual turnover exceeding £1 billion, it is financially and managerially independent of the University of London.

The UCL community

UCL's staff and former students have included 29 Nobel prizewinners. It is a truly international community: more than one-third of our student body – more than 35,000 strong – come from 150 countries and nearly one-third of staff are from outside the UK.

UCL offers postgraduate research opportunities in all of its subjects, and provides more than 200 undergraduate programmes and more than 400 taught postgraduate programmes. Approximately 54% of the student community is engaged in graduate studies, with about 29% of these graduate students pursuing research degrees.

Quality of UCL's teaching and research

UCL is independently ranked as the most productive research university in Europe (SIR).

It has 983 professors – the highest number of any university in the UK – and the best academic to student ratio of any UK university (*The Times*, 2014), enabling small class sizes and outstanding individual support.

In Research Excellence Framework 2014 (REF2014), UCL was rated the top university in the UK for 'research power' (the overall quality of its submission multiplied by the number of FTE researchers submitted). It was rated top not only in the overall results, but in each of the assessed components: publications and other research outputs; research environment; and research impact. REF2014 confirmed UCL's multidisciplinary research strength, with many leading performances across subject areas ranging from biomedicine, science and engineering and the built environment to laws, social sciences and arts and humanities.

Equality

UCL is proud of its longstanding commitment to equality and to providing a learning, working and social environment in which the rights and dignity of its diverse members are respected.

Some highlights below:

- **Race Charter Mark** - UCL holds a Bronze Race Equality Charter Mark award, recognising UCL's commitment to improving the representation, progression and success of minority ethnic staff and students.
- **Athena SWAN** - UCL holds an institutional Silver **Athena SWAN** award – this recognises our commitment to and impact in addressing gender equality. Departments at UCL are also engaged in the Athena SWAN charter, with 29 departments holding an award; 16 Silver and 13 Bronze.
- **Staff networks** - We have a number of staff networks that run a range of social and development activities, for example **Out@UCL**, **PACT**, **Enable@UCL**, **the race equality staff network**, **Astrea** and **UCL Women**.
- **B-MEntor** – **B-MEntor** is a mentoring scheme for black and minority ethnic staff. The mentoring scheme is a collaborative initiative with a number of London-based universities.
- **Sabbatical Leave following maternity** – UCL provides one term of sabbatical leave without teaching commitments for research-active academics returning from maternity, additional paternity, adoption or long-term carer's leave. This support for returners enables staff to more quickly re-establish their research activity.

Please see our **Equalities and Diversity Strategy 2015-2020** for information on our current priorities.

Location and working environment

Based in Bloomsbury, UCL is a welcoming, inclusive university situated at the heart of one of the world's greatest cities.

UCL's central campus is within easy reach of Euston, Kings Cross and Marylebone mainline stations, the new Eurostar terminal at St. Pancras and the following Underground stations - Euston Square, Warren Street, Goodge Street and Russell Square. Road connections to the M1 and M40 motorways give easy access to the north and west road networks. There are also good public transport links to Heathrow airport.

Application procedure

Further details about the post and the application procedure are available at www.london-nano.com. If you have any queries regarding the vacancy or the application process, please contact Denise Ottley at the London Centre for Nanotechnology, d.ottley@ucl.ac.uk or 17-19 Gordon Street, London WC1H 0AH, for advice.