

## Job Related Information

This document includes information about the role for which you are applying and the information you will need to provide with your application.

### 1. Role Details

Vacancy reference	13526
Job title:	Early Stage Researcher (ESR), Marie Curie Initial Training Network
Reports to:	Professor of Physics
Salary:	£32,000 plus allowances
Terms and conditions:	Research
Grade	INDIV
Duration of post:	36 months
Working hours:	Full Time
Location:	Milton Keynes
Closing date:	Noon on 9 May 2017
Type of application form accepted:	Short
Number of referees required:	Three
Unit recruitment contact:	Fiona McGavin

## 2. Summary of duties

This appointment offers the opportunity to work in the field of molecular physics as part of the Marie Curie Innovative Training Network (ITN) **Low energy ELEctron driven chemistry for the advantage of emerging Nano-fabrication methods (ELENA)** funded by the European Commission H2020 programme.

ELENA is a multidisciplinary and intersectoral ITN with the objective to train 15 Early Stage Researchers (ESR) within a collaborative academic and commercial challenging research network involving 12 full-partners and 8 associate partners with the aim of gaining an understanding of the fundamental processes underpinning two innovative, next generation nanoscopic fabrication techniques; Focused Electron, Beam Induced Deposition (FEBID) and Extreme Ultra Violet Lithography (EUVL) and translate this knowledge into the design of precursor molecules specifically for FEBID and EUVL resists, such that FEBIP and EUVL may be further optimized in performance, with the ultimate goal of making them commercially competitive.

The main objective of the project at The Open University is to explore electron induced dissociation of molecular systems that may be used as precursors for building nanostructures by FEBID and EUVL. The project will exploit the technique of Velocity Map Imaging (VMI) (developed in the host institution as part of a long term collaboration with Indian research colleagues) to explore two electron induced pathways, Dissociative Electron Attachment (DEA) and Dipolar Dissociation (DD).

The successful candidate will undertake training and experiments at other sites within the EU Training Network working with other ESRs and will include secondments to one or more industrial partners where business focussed skills training will be provided. It is envisaged that 9 of the 36 months may be spent on such secondments.

All staff are expected:

- to undertake any other duties which may reasonably be required
- to take reasonable care of the Health and Safety of themselves and that of any other person who may be affected by your acts or omissions at work.
- to demonstrate a strong commitment to the principles and practice of equality and diversity

## 3. Person specification

### Requirements (E = Essential/ D = Desirable)

#### Education, qualifications and training

An excellent Master's degree in one of the following fields; atomic and molecular physics, physical chemistry, chemical physics, materials or a related area. It is required that the degree has been acquired not more than 4 years earlier to the envisaged starting date of this appointment.

#### Knowledge, work and other relevant experience

<b>Essential:</b>	Good knowledge of English as you will be expected to submit project reports in English.
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<b>Desirable:</b>	
<b><u>Personal abilities and qualities</u></b>	
<b>Essential:</b>	Must have spent less than 12 months living in the UK during the three years prior to the start of this appointment – please see next section for more detail
<b>Desirable:</b>	

## 4. Role specific requirements e.g. Shift working

The appointment is offered in the context of a Marie Curie Innovative Training Network (ITN) and transnational mobility is a key element of eligibility. Therefore candidates' eligibility for the post is determined by Marie Curie terms and conditions. Researchers may be either EU citizens or from outside the EU (subject to relevant immigration formalities), but **applications will only be accepted from candidates who have spent less than 12 months in the UK within the last three years from the start date of employment.**

Furthermore, **candidates who will have already completed a PhD by the start date of employment are not eligible.**

The funding for this fellowship covers the monthly salary for three years and other allowances in line with Marie Curie H2020 terms and conditions. The total fellowship monetary award is approximately €50,000 per annum. The annual salary and mobility amounts quoted are the gross amount and will be subject to appropriate tax and national insurance deductions.

## 5. About the unit/department

### **Faculty of Science, Technology, Engineering & Mathematics**

The newly formed Faculty of Science, Technology, Engineering and Mathematics (STEM) comprises:

- School of Computing & Communications
- School of Environment, Earth & Ecosystem Sciences
- School of Engineering & Innovation
- School of Life, Health & Chemical Sciences
- School of Mathematics & Statistics
- School of Physical Sciences
- Knowledge Media Institute
- Deanery including teams supporting Curriculum, Research and Enterprise, Laboratory Infrastructure and Faculty Administration

**“We aspire to be world leaders in inclusive, innovative and high impact STEM teaching and research, equipping learners, employers and society with the capabilities to meet tomorrow’s challenges”**

The Faculty of STEM consists of 700 staff and 1,800 Associate Lecturers. The Faculty delivers over 185 modules across undergraduate and postgraduate curriculum, supporting more than 20,000 students (full time equivalents) which is 29% of the OU total.

The Faculty generates more research income (circa £20M) than any other Faculty in the University, supported by a comprehensive laboratory infrastructure.

We are proud of our distinctive values and capabilities underpinning our aspiration:

*We are inclusive:*

- We transform people's lives, ensuring STEM education is openly accessible to many thousands of students from diverse backgrounds – our students express high satisfaction with their study experience
- We engage the public in exciting citizen science and engineering, including through free open educational resources, multi-platform broadcasting, outreach to inspire the next generation and with programmes to encourage more women into STEM

*We are highly innovative:*

- We are at the forefront of innovative developments in teaching practical science and engineering at a distance, through simulated and remote access laboratories and practical experimentation
- Our high quality teaching and curriculum are informed by world-leading research, strong links with professional bodies and communities of practitioners, as well as by scholarship focused on continuously improving our STEM pedagogy

*We deliver significant social and economic impact:*

- We provide STEM higher education at a scale and reach unsurpassed in the UK, with a sizeable international reach and further growth potential
- We inject transferable STEM skills and knowledge direct into the workplace for immediate employee and employer benefit, as students combine study while working
- The employability value of our courses is underpinned by accreditation from leading STEM Professional Bodies and Learned Societies, as well as partnerships and sponsorship with leading employers
- Our high quality, applied and academically relevant teaching and research addresses real-world issues, delivering impact for industry and society, including addressing pressing STEM skill-shortages across the UK

### **School of Physical Sciences**

The [School of Physical Sciences](#) is a lively and innovative community of approximately 80 academic and research staff and 70 PhD students, mostly based in Milton Keynes. Our curriculum is supported by associate lecturer staff based all over the UK and Ireland; physics, astronomy and planetary sciences undergraduate modules are currently being studied by hundreds of students all over the world and we also contribute to an introductory and interdisciplinary science modules being studied by several thousand students.

Our research covers a wide range of subjects, broadly aligned with the research disciplines of

- Astronomy
- Physics
- Planetary and Space Sciences
- Space Instrumentation
- Physics Education

We have an unparalleled suite of analytical instrumentation in our modern laboratories on campus; this is complemented by our regular use of multi-national facilities such as the Diamond synchrotron and ESO's telescopes. We have contributed to well-known space missions such as the Rosetta Mission, and have developed some of our spaceflight instrumentation for medical and environmental applications.

School members also contribute to the Open University's teaching on a large range of modules and we have been at the forefront of many innovations in distance education, including the OpenScience Lab. We are members of [SEPnet](#), the South East Physics Network. Our commitment to equality and diversity has been recognised by the award of "[Juno Champion](#)" status by the Institute of Physics and an [Athena SWAN](#) Silver Award.

We currently offer undergraduate qualifications in Mathematics and Physics and Natural Sciences (with a physics pathway and an astronomy and planetary science pathway), with a strand which carries Institute of Physics accreditation. We are in the process of refreshing the curriculum, both at entry level to reflect the diverse range of entry qualifications of our students, and at Stage 3. In the near future we are likely to offer

a BSc (Hons) Physics and/or a BSc (Hons) Astronomy and Planetary Science and/or an integrated MPhys, including physics, astronomy, planetary and Space science. A new MSc in Space Science and Technology is currently recruiting students and will run for the first time from February 2017.

### **Priority Research Areas in the School of Physical Sciences**

#### ***Astronomy***

- The Compositional Universe: exploiting the spectroscopic discovery space from ALMA, JWST, SPICA, SOFIA and IRAM/NOEMA, E-ELT, VLT, SKA, JCMT, SALT, LOFAR, ELIPS, Herschel, SDSS-IV, Euclid strong lensing, etc., to study galactic star formation, evaporating exoplanets, and the physics of galaxies in the distant universe. We will further develop our laboratory/observational astrochemistry research to focus on the development of molecular compositional diagnostics.
- The Time-Domain Universe: exploiting the discovery space of new and future telescopes e.g. Gaia, LIGO, PLATO 2.0, TWINKLE, VLT and LSST, in studies such as galactic and extragalactic stellar populations using leading follow-up facilities such as SALT, or (as part of a wider follow-up network) our robotic telescopes, with a focus on key processes such as stellar binarity.

#### ***Physics***

- Biomedical physics: to understand physical phenomena involved in conditions such as cancer and cardiovascular diseases and their treatment through experimental and theoretical investigations of a range of approaches such as electron-driven processes in radiation treatment and imaging, use of nanoparticles for cancer therapy and plasma sources for biomedical purposes.
- Quantum correlated systems: theoretical and experimental study of quantum correlations in atomic, molecular and condensed matter systems, and the development of practical applications such as quantum enhanced devices and the functionalisation of materials, as well as the development of multi-purpose software to treat electronic continua.
- Engineering physics: applied plasma research aimed at developing novel functional materials, understanding electron induced processes in nanofabrication and the development of plasma-driven techniques for advanced materials applications.

#### ***Planetary and Space Science***

- Application of advanced analytical techniques, laboratory simulation, remote observation and modelling to investigate the key processes involved in the formation and evolution of the Solar System and the planetary bodies it contains, including the search for habitable environments and the presence of life.
- Maintain and build high scientific credibility for our analytical expertise by exploiting the performance of existing instruments and updating the analytical infrastructure in order to ensure leading involvement in upcoming sample-return missions, and maintain access to the most important planetary samples. Particular strengths are in the measurement of light-stable isotopes using conventional mass spectrometry and *in-situ* analysis of samples.
- Development and expansion of our expertise in planetary environments using modelling, remote sensing and the use of field analogues and simulation facilities on Earth, and secure further leading science team involvements in future planetary space missions.

#### ***Space Instrumentation***

- Development of imaging sensors and instruments for space applications, with expertise in a range of wavelengths from IR to X-ray and the study of the effects of radiation damage, in order to secure involvement in future space missions.
- Development of miniaturized analytical instrument systems for planetary exploration missions, particularly for the measurement of volatiles, organic materials and their light stable isotope composition, and securing leading involvement in future planetary exploration missions.
- Knowledge exchange between the UK technology industry and academia, utilising the technologies and expertise in detectors and mass spectrometer systems to provide commercial products and solutions.

#### ***Physics Education Research***

- Remote and virtual experimentation
- Concept inventories
- Interactive online assessment

- Demographic differences in achievement

## 6. How to obtain more information about the role or application process

If you would like to discuss the particulars of this role before making an application please contact Professor Nigel Mason on +44 (0)1908 655253 or email: [nigel.mason@open.ac.uk](mailto:nigel.mason@open.ac.uk).

If you have any questions regarding the application process please contact Fiona McGavin on +44 (0)1908 858110 or email: [STEM-Recruitment@open.ac.uk](mailto:STEM-Recruitment@open.ac.uk).

## 7. The application process and where to send completed applications

Your application should contain:	<ul style="list-style-type: none"> <li>• Completed short application form</li> <li>• CV</li> <li>• Covering Letter</li> </ul>
Please ensure that your application reaches the University by:	Noon on Tuesday 9 May 2017
E-mail your application to:	<a href="mailto:STEM-Recruitment@open.ac.uk">STEM-Recruitment@open.ac.uk</a>
Or post it to Name/Job title:	Fiona McGavin, Staffing Adviser
Department/Unit:	Deanery, Faculty of Science, Technology, Engineering & Mathematics
Address:	The Open University, Walton Hall, Milton Keynes, MK7 6AA

## 8. Selection process and date of interview

The interview panel will be chaired by:	Professor Nigel Mason
The other members of the interview panel will be:	Dr Sam Eden Dr Jimena Gorfinkiel
The interviews will take place on:	To be confirmed
The selection process for this post will include	<p>Selection will be in two stages. Candidates on a long list will be invited to a 'remote' interview e.g. by Skype) after which a short list will be prepared and face to face interview held at the Open University.</p> <p>We will let you know as soon as possible after the closing date whether you have been shortlisted for initial (long list) interview. Further details on the selection process will also be sent to shortlisted candidates.</p> <p>Applications received after the closing date will not be accepted.</p>



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