Imperial College
London

Job Description

Job Title	Research Assistant (Marie Curie Early Stage Researcher),
Department / Section	Physics, Quantum Optics and Laser Science Group
Location	South Kensington Campus
Reporting To	Project Coordinator
Working Closely With	Research Assistants/ Associates, Other project partners
Level	A
Working Hours	Not normally less than 35 hours per week
Fixed-Term	36 months
Start Date	1 September 2014

Summary of Post

Imperial College London is recruiting 8 Early Stage Researchers (ESRs) to join the Marie Curie Innovative Doctoral Programme (IDP) "Frontiers in Quantum Technology (FQT)". The IDP will provide multidisciplinary training culminating in PhDs awarded by Imperial College London.

With the ever growing demands on technology, electronic devices are fast approaching the realm where only a fully quantum treatment can explain the fluctuations in (and limitations of) these devices. Pushing the frontiers of the 'very small' has well-publicised potential benefits, and the ability to engineer materials at the atomic level has led to the enormously active field of nanotechnology. Another strand of development is the temporal frontier of the 'very fast'. New research directions using extremely short pulses of laser radiation also look set to bring about a revolution in our understanding of many fundamental processes, with widespread potential applications.

The FQT programme aims to train a total of 13 internationally competitive researchers, who will have the skills and knowledge necessary for developing current and future quantum technologies. Research activities carried out at Imperial College cover a vast range of theoretical and experimental aspects of quantum sciences, and FQT will take advantage of this expertise to provide tailored training and research in key areas relevant to quantum technologies. In particular, ESRs will receive training in the principles underpinning the generation of extreme light sources, the control and manipulation of quantum systems, and light-matter interactions. A crucial feature of the programme will be the close interaction with partners in both industry and academia and projects will involve a high degree of teamwork and interdisciplinary research, including secondments of up to 10 months at a partner organisation.

Successful applicants will join 5 existing ESRs already working on challenging state-of-the-art experiments in quantum technology. The new intake will work on a variety of theoretical and experimental projects. Interested applicants should contact the relevant supervisors below:

- Solid state light sources for quantum computing – Prof Terry Rudolph (t.rudolph@imperial.ac.uk)
- Ion Coulomb Crystals in a Penning trap as a resource for quantum simulations – Prof Danny Segal (d.segal@imperial.ac.uk)
- Testing QED in extreme fields using trapped highly charged ions – Prof Danny Segal (d.segal@imperial.ac.uk)
- Matter-wave interferometry on an atom chip – Prof Ed Hinds (ed.hinds@imperial.ac.uk)
- Super-strong coupling toward quantum control - Prof. Myungshik Kim (m.kim@imperial.ac.uk)
- Attosecond transient absorption – Prof Jon Marangos (j.marangos@imperial.ac.uk)
- Quantum plasmonics and coupling of single quantum emitters to nanostructures – Prof. Stefan Maier (s.maier@imperial.ac.uk)
- Quantum computing and communication – Prof Myungshik Kim (m.kim@imperial.ac.uk)

For further information, please consult our website www.imperial.ac.uk/fqt

Main Duties for a Research Assistant

- To undertake any necessary training and/or development
- To acquire and interpret research data and results
- To run analyses and tests using specified and agreed techniques and models
- To prioritise tasks within agreed work schedule
- To contribute to the development of techniques, models and methods, for the collection and analysis of data
- To ensure the validity and reliability of data at all times
- To maintain accurate and complete records of all findings
- To prepare material for presentation in oral and poster formats
- To assist with the presentation of findings to colleagues and at conferences
- To assist in the drafting of publications for submission to refereed journals
- To advise and assist other staff and students within limited area of expertise.
- To attend relevant workshops and conferences as necessary
- To develop contacts and research collaborations within the College and the wider community
- To promote the reputation of your respective research Group, the Department and the College

Other Duties

- To undertake appropriate administration tasks
- To attend relevant meetings
- To comply with relevant College policies, including Financial Regulations, Equal Opportunities Policy, Promoting Race Equality Policy, Health and Safety Policy, Information Systems Security Policy and Intellectual Property Rights and Register of Interests Policies
- To maintain safe workplace practice and procedures in accordance with the requirements of Health and Safety legislation;

- To maintain an up to date knowledge of relevant statutory Health and Safety legislation and recommendations and attend safety training as required.
- To contribute to the Department's teaching activities up to approximately half a day per week during the academic year, as appropriate
- Any other duties commensurate with the grade of the post as directed by line manager / supervisor

***To observe and comply with all College policies and regulations, including the* key policies and procedures on Confidentiality, Conflict of Interest, Data Protection, Equal Opportunities, Financial Regulations, Health and Safety, Imperial Expectations (for new leaders, managers and supervisors), Information Technology, Private Engagements and Register of Interests, and Smoking.**

To undertake specific safety responsibilities relevant to individual roles, as set out on the College Website Health and Safety Structure and Responsibilities page (http://www3.imperial.ac.uk/safety/policies/organisationandarrangements).

Job descriptions cannot be exhaustive and the post-holder may be required to undertake other duties, which are broadly in line with the above key responsibilities.

Imperial College is committed to equality of opportunity and to 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 all other relevant guidance/practice frameworks.

Person Specification

Job Title Research Assistant (Marie Curie Early Stage Researcher)

Department / Section Physics, Quantum Optics and Laser Science Group

In accordance with the criteria set out by Marie Curie Innovative Doctoral Programme, the researchers must not have resided or carried out main activity (work, study, etc) in the host country for more than 12 months in the 3 years immediately prior to taking up a fellowship. Also, in accordance with the criteria the researcher at the time of recruitment must not yet have been awarded the doctorate degree and must be in the first 4 years (full-time equivalent) of their research career.

Qualifications

- Masters Degree in Physics or equivalent and have an interest in one of the topics listed below:
  - Solid state light sources for quantum computing
  - Ion Coulomb Crystals in a Penning trap as a resource for quantum simulations
  - Testing QED in extreme fields using trapped highly charged ions
  - Matter-wave interferometry on an atom chip

- Super-strong coupling toward quantum control
- Attosecond transient absorption
- Quantum plasmonics and coupling of single quantum emitters to nanostructures
- Quantum computing and communication

Knowledge / Experience

- Experience of undertaking a Masters research project (or equivalent) in a relevant experimental field is essential

Skills and Abilities

- Ability to conduct a detailed review of recent literature
- Ability to develop and apply new concepts is essential
- Creative approach to problem-solving
- Excellent verbal communication skills and the ability to deal with a wide range of people is essential
- Excellent written communication skills and the ability to write clearly and succinctly for publication is essential
- Ability to organise own work with minimal supervision
- Ability to prioritise own work in response to deadlines
- Computer skills, including word-processing, programme in LabView and familiarity with object-orientated programming

Personal Attributes

- Willingness to work as part of a team and to be open-minded and cooperative
- Commitment to meeting deadlines
- Commitment to maintaining and enhancing facilities and training others in their use
- Flexible attitude towards work
- Discipline and regard for confidentiality and security at all times
- Willingness to undertake any necessary training for the role
- Willingness to travel both within the United Kingdom and abroad to conduct extended research secondments as well as attend conferences, workshops/summer schools and other meetings