Department of Physics
Clarendon Laboratory
Parks Road, Oxford OX1 3PU

UNIVERSITY OF OXFORD

Job description and selection criteria

Job title	Postdoctoral Research Assistant in Terahertz Spectroscopy of Semiconductor Nanowires
Division	Mathematical, Physical and Life Sciences Division
Department	Physics
Location	Clarendon Laboratory, Parks Road, Oxford, OX1 3PU
Grade and salary	Grade 7: £31,076 - £38,183 per annum
Hours	Full time (37.5 hours per week)
Contract type	Fixed-term for 36 months
Reporting to	Prof Michael Johnston
Vacancy reference	127920
Additional information	Closing date – midday (UK time) on Tuesday 18th April 2017

Research topic	Terahertz spectroscopy of semiconductor nanowires
Principal Investigator / supervisor	Prof Michael Johnston
Project team	
Project web site	https://www-thz.physics.ox.ac.uk
Funding partner	The funds supporting this research project are provided by the European Union's Horizon 2020 research and innovation programme under grant agreement No 735008
Recent publications	Nano Lett., 16:4925-4931 (Aug 2016) ACS Nano, **10**:4219-4227 (Mar 2016) Nano Lett., **15**:1336-1342 (Jan 2015)

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Athena SWAN Silver Award

The role

A Postdoctoral Research Assistant position is available for 36 months in the Department of Physics at the University of Oxford to work on **terahertz spectroscopy of semiconductor nanowires**. The project forms part of an exciting new European Union Horizon 2020 research and innovation programme grant, SILAS, which aims at the development of a silicon-based laser, that has the potential to revolutionize the electronics industry by adding intra-chip and chip-to-chip optical communication. Work on this project in Oxford will concentrate on the non-contact electronic and optoelectronic characterisation of novel semiconducting nanowires using the experimental technique of optical pump terahertz probe spectroscopy.

The role promises to be exciting and challenging, and we will rely on the successful applicant to significantly advance both the technology and our fundamental understanding of optoelectronic processes occurring in semiconductor nanowires.

Responsibilities

- Undertake the research activities described in the Project Description and as requested by the supervisor.
- Manage one's own academic research and administrative activities. This involves small scale project management, to co-ordinate multiple aspects of work and to meet deadlines.
- Adapt existing and develop new scientific techniques and experimental protocols. In particular advanced spectroscopic techniques.
- Research in depth and breadth the topic being studied and to put ones work in the context of past and present work in the research field.
- Test hypotheses and analyse scientific data from a variety of sources, reviewing and refining working hypotheses as appropriate.
- Contribute ideas for new research directions.
- Collaborate in the preparation of scientific reports and journal articles.
- Use specialist scientific equipment in a laboratory environment, including Class 4 lasers, liquid cryogens, and high vacuum equipment.
- Working with nanoscale semiconductors from a range of materials in a range of crystal structures.
- Act as a source of information and advice to other members of the group on scientific protocols and experimental techniques.
- Represent the research group at external meetings/seminars, either with other members of the group or alone.
- Carry out collaborative projects with colleagues in partner institutions, and research groups.

Hazard-specific / Safety-critical duties

This job includes the following hazard-specific or safety-critical duties which will require successful pre-employment health screening through our Occupational Health Department before the successful candidate will be allowed to start work:

- Work with class 3b or 4 lasers
- Work with liquid cryogens
- Other safety-critical work

Selection criteria

Essential

1. Applicants should possess (or be close to obtaining) a PhD in physics, materials science, chemistry or engineering.
2. Expertise in advanced optical spectroscopy.
3. Expertise in characterisation of semiconductor materials
4. A good knowledge of semiconductor and device physics
5. Good track record of high quality publications
6. Excellent verbal and written communication skills in English
7. Applicants should be highly motivated and have excellent skills in working collaboratively, as part of a team.
8. Excellent problem solving skills

Desirable

8. The ability to direct your own research and interpret your results independently.
9. Expertise in experimental work on semiconductor nanowires
10. Expertise in optical spectroscopy
11. Expertise electrical characterisation of semiconductors
12. Expertise in building opto-mechanical systems
13. Experience of safe working with and general maintenance of class 4 lasers systems.

About the University of Oxford

Welcome to the University of Oxford. We aim to lead the world in research and education for the benefit of society both in the UK and globally. Oxford's researchers engage with academic, commercial and cultural partners across the world to stimulate high-quality research and enable innovation through a broad range of social, policy and economic impacts.

We believe our strengths lie both in empowering individuals and teams to address fundamental questions of global significance, and in providing all of our staff with a welcoming and inclusive workplace that supports everyone to develop and do their best work. Recognising that diversity is a great strength, and vital for innovation and creativity, we aspire to build a truly diverse community which values and respects every individual's unique contribution.

While we have long traditions of scholarship, we are also forward-looking, creative and cutting-edge. Oxford is one of Europe's most entrepreneurial universities. Income from external research contracts in 2014/15 exceeded £522.9m and ranked first in the UK for university spin-

outs, with more than 130 spin-off companies created to date. We are also recognised as leaders in support for social enterprise.

Join us and you will find a unique, democratic and international community, a great range of staff benefits and access to a vibrant array of cultural activities in the beautiful city of Oxford.

For more information please visit www.ox.ac.uk/about/organisation

Department of Physics

Oxford Physics is one of the largest and most eminent departments in Europe – pursuing forefront research alongside training the next generation of leaders in Physics.

With an academic staff of almost one hundred our activities range from fundamental particles to the furthest reaches of the universe to manipulating matter on an atomic scale. Oxford physicists are probing new ways to harness solar energy, modelling the Earth's atmosphere to predict the future climate, exploring computation on the quantum scale and executing calculations that reveal the fundamental structure of space and time.

For more information please visit: http://www2.physics.ox.ac.uk/

Condensed Matter Physics Sub-department

The post-holder will be based in the Condensed Matter Physics sub-department, which is one of the six sub-departments that together make up the Department of Physics; these are Astrophysics, Atomic and Laser Physics, Atmospheric, Oceanic and Planetary Physics, Condensed Matter Physics, Particle Physics and Theoretical Physics, with a seventh function (Central Physics) providing administrative and technical support to these sub-departments. Members of all sub-departments take part in research, teaching and matters such as examinations, discussion of syllabi, lectures and liaison with undergraduates and postgraduate students.

Athena Swan Charter

The Department of Physics holds a silver Athena Swan award to recognise advancement of gender equality: representation, progression and success for all.

Mathematical, Physical & Life Sciences Division

The Mathematical, Physical and Life Sciences (MPLS) Division is one of the four academic divisions of the University of Oxford.

The MPLS Division's 10 departments and 3 interdisciplinary units span the full spectrum of the mathematical, computational, physical, engineering and life sciences, and undertake both fundamental research and cutting-edge applied work. Our research addresses major societal and technological challenges and is increasingly focused on key interdisciplinary issues. We collaborate closely with colleagues in Oxford across the medical sciences, social sciences and humanities, and with other universities, research organisations and industrial partners across the globe in pursuit of innovative research geared to address critical and fundamental scientific questions.

For more information please visit: http://www.mpls.ox.ac.uk/

How to apply

For Professional and Management OR Support and Technical roles only:

Before submitting an application, you may find it helpful to read the 'Tips on applying for a job at the University of Oxford' document, at www.ox.ac.uk/about/jobs/supportandtechnical/.

If you would like to apply, click on the **Apply Now** button on the 'Job Details' page and follow the on-screen instructions to register as a new user or log-in if you have applied previously. Please provide details of two / three *(select the required number of referees – two is the norm in most circumstances)* referees and indicate whether we can contact them now.

You will also be asked to upload a CV and / or a supporting statement. OR You will be asked to upload a CV and statement of research interests. The supporting statement should explain how you meet the selection criteria for the post using examples of your skills and experience. This may include experience gained in employment, education, or during career breaks (such as time out to care for dependants). *If you are using the application form with inbuilt supporting statement there is no facility for applicants to attach documents so this paragraph should be removed.*

Your application will be judged solely on the basis of how you demonstrate that you meet the selection criteria stated in the job description.

Please upload all documents **as PDF files** with your name and the document type in the filename. (*Customise this statement to confirm the document(s) you would like the applicant to attach, but make sure that you keep the reference to PDF. See section 1.4 of QRG REC01 Creating a Vacancy (Recruitment and Personnel) for guidance on selecting the appropriate application form).*

All applications must be received by **midday** on the closing date stated in the online advertisement.

Information for priority candidates

A priority candidate is a University employee who is seeking redeployment because they have been advised that they are at risk of redundancy, or on grounds of ill-health/disability. Priority candidates are issued with a redeployment letter by their employing departments.

If you are a priority candidate, please ensure that you attach your redeployment letter to your application (or email it to the contact address on the advert if the application form used for the vacancy does not allow attachments)

Should you experience any difficulties using the online application system, please email recruitment.support@admin.ox.ac.uk. Further help and support is available from www.ox.ac.uk/about_the_university/jobs/support/. To return to the online application at any stage, please go to: www.recruit.ox.ac.uk.

Please note that you will be notified of the progress of your application by automatic emails from our e-recruitment system. **Please check your spam/junk mail** regularly to ensure that you receive all emails.

Important information for candidates

Pre-employment screening

Please note that the appointment of the successful candidate will be subject to standard pre-employment screening, as applicable to the post. This will include right-to-work, proof of identity and references. We advise all applicants to read the candidate notes on the University's pre-employment screening procedures, found at:

www.ox.ac.uk/about/jobs/preemploymentscreening/.

The University's policy on retirement

The University operates an employer justified retirement age for all academic and academic-related posts (grade 6 and above), for which the retirement date is the 30 September immediately preceding the 68th birthday. The justification for this is explained at: www.admin.ox.ac.uk/personnel/end/retirement/revisedejra/revaim/.

For **existing** employees any employment beyond the retirement age is subject to approval through the procedures: www.admin.ox.ac.uk/personnel/end/retirement/revisedejra/revproc/

There is no normal or fixed age at which **support staff** in posts at **grades 1–5** have to retire. Support staff may retire once they reach the minimum pension age stipulated in the Rules of the pension scheme to which they belong.

Equality of Opportunity

Entry into employment with the University and progression within employment will be determined only by personal merit and the application of criteria which are related to the duties of each particular post and the relevant salary structure. In all cases, ability to perform the job will be the primary consideration. No applicant or member of staff shall be discriminated against because of age, disability, gender reassignment, marriage or civil partnership, pregnancy or maternity, race, religion or belief, sex, or sexual orientation.

Benefits of working at the University

Training and Development

A range of training and development opportunities are available at the University. Further details can be found at www.ox.ac.uk/staff/working_at_oxford/training_development/index.html.

For research staff only: Support for Research Staff

There is a particularly wide range of support for career development for research staff. Please visit: www.ox.ac.uk/research/support-researchers to find out more.

Pensions

The University offers generous occupational pension schemes for eligible staff members. Further details can be found at www.admin.ox.ac.uk/finance/epp/pensions/pensionspolicy/.

Information for international staff *(or those relocating from another part of the UK)*

A wealth of information is available on the University's International Staff website for staff who are relocating to Oxford from abroad, at www.admin.ox.ac.uk/personnel/staffinfo/international/.

The University of Oxford Newcomers' Club

The Newcomers' Club is aimed at helping partners of newly-arrived visiting scholars, graduate students and academic members of the University to settle in and to meet people in Oxford.

Transport schemes

The University offers a range of travel schemes and public transport travel discounts to staff. Full details are available at www.admin.ox.ac.uk/estates/ourservices/travel/.

University Club and University Sports Facilities

The University Club provides social, sporting and hospitality facilities. It incorporates a Club bar, a cafe and sporting facilities, including a gym. See www.club.ox.ac.uk for all further details.

University staff can use the University Sports Centre at discounted rates, and have the chance to join sports clubs. Please visit www.sport.ox.ac.uk/oxford-university-sports-facilities.

Childcare and Childcare Vouchers

The University offers quality childcare provision services at affordable prices to its employees. For full details about the services offered, please visit www.admin.ox.ac.uk/childcare/. **NB: Due to the high demand for the University's nursery places there is a long waiting list.**

The University also offers nursery fee payment schemes to eligible staff as an opportunity to save tax and national insurance on childcare costs. Please visit www.admin.ox.ac.uk/childcare.

Disabled staff

The University is committed to supporting members of staff with a disability or long-term health condition and has a dedicated Staff Disability Advisor. Please visit www.admin.ox.ac.uk/eop/disab/staff for further details.

BUPA - Eduhealth

Bupa Eduhealth Essentials private medical insurance offers special rates for University of Oxford staff and their families www.eduhealth.co.uk/mini-site/.

All other benefits

For other benefits, such as free entry to colleges, the Botanic Gardens and staff discounts offered by third party companies, please see www.admin.ox.ac.uk/personnel/staffinfo/benefits/.