

Job description and selection criteria

Job title	Postdoctoral Research Assistant in Experimental Particle Acceleration with High Power Lasers
Division	Mathematical, Physical and Life Sciences Division
Department	Department of Physics
Location	Atomic & Laser Physics, Clarendon Laboratory, Parks Road, Oxford OX1 3PU
Grade and salary	Grade 7: £30,434 - £37,394 p.a.
Hours	Full time (37.5 hours per week)
Contract type	Fixed-term for 2 years from 01-Mar-16 with possible extension to 3.5 years
Reporting to	Prof Gianluca Gregori and Prof Subir Sarkar
Vacancy reference	121219
Additional information	Closing date 17 th December 2015



The University of Oxford is a member of the [Athena SWAN Charter](#) and holds an institutional Bronze Athena SWAN award. The Department of Physics holds a departmental Bronze Athena award in recognition of its efforts to introduce organisational and cultural practices that promote gender equality in SET and create a better working environment for both men and women.

Introduction

The University

The University of Oxford is a complex and stimulating organisation, which enjoys an international reputation as a world-class centre of excellence in research and teaching. It employs over 11,000 staff and has a student population of over 22,000.

Our annual income in 2013/14 was £1,174.4m. Oxford is one of Europe's most innovative and entrepreneurial universities: income from external research contracts exceeds £478.3m p.a., and more than 80 spin-off companies have been created.

Oxford is a collegiate university, consisting of the central University and colleges. The central University is composed of academic departments and research centres, administrative departments, libraries and museums. There is a highly devolved operational structure, which is split across four academic divisions, Academic Services and University Collections and University Administrative Services. For further information, please see:

www.ox.ac.uk/staff/about_the_university/new_to_the_university/structure_of_university.

For more information please visit <http://www.ox.ac.uk/about>

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/>

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/>

Atomic and Laser Physics Sub-department

The post-holder will be based in the Atomic and Laser 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.

Job description

Research topic	Laboratory Astrophysics
Principal Investigator / supervisor	Prof Gianluca Gregori
Project team	Prof Gianluca Gregori & Prof Subir Sarkar
Funding partner	The funds supporting this research project are provided by Engineering and Physical Sciences Research Council (EPSRC)
Recent publications	G. Gregori et al., Nature 481, 480 (2012); J. Meinecke et al., Nature Phys. 10, 520 (2014)
Technical skills	Lasers and plasma physics

Overview of the role

The origin of high-energy cosmic rays still remains a mystery, a century after their discovery. Although several different processes and astrophysical sites may be implicated, there is a consensus that diffusive shock acceleration in Galactic supernova remnants accelerates the bulk of hadronic cosmic rays, up to hundreds of TeV in energy. This project aims at providing a new route towards the understanding of cosmic ray acceleration via laboratory experiments using high power lasers (from University scale to the largest ones in the world, notably the National Ignition Facility). The successful candidate will lead the planning and execution of experiments as well as the analysis of the data with both numerical and analytical methods. He/she may also be involved in studying the role of turbulence in producing the observed synchrotron emission spectrum in young supernova remnants.

Responsibilities/duties

- Apply knowledge of laser-plasma interaction physics and plasma diagnostics (both in the optical and x-ray regimes) to plan and prepare experiments on laser facilities
- Lead the execution of experiments at large-scale laser facilities (such as Vulcan, LULI, Omega and NIF)
- Flexibility in the experimental times and available for overseas travels
- Perform analysis of data using computer codes
- Ability of summarizing experimental finding in written reports/papers and presentations at international conferences
- Maintenance of the Oxford laser facility as well as training of students and other research staff on laser operations

- Work with class 3b and 4 lasers
- Demonstrate and apply laser safety rules and regulations while working with lasers
- Collaborate in the preparation of scientific reports and journal articles and present research papers and posters at conferences and workshops.
- Represent the research group at external meetings/seminars, either with other members of the group or alone.
- Participate in and help to organize scientific conferences, workshops, journal clubs and seminars related to the project
- Participate in the supervision of graduate students
- Contribute to existing efforts and activities of the research group
- Contribute ideas for new research projects.
- Act as a source of information and advice to other members of the department (including students) on own particular areas of expertise.
- Manage own academic research and administrative activities, involving small-scale project management and coordinating multiple aspects of work to meet deadlines.
- The post-holder will have the opportunity to teach. This may include lecturing , small group teaching, and tutoring of undergraduates and graduate students.

Selection criteria

Essential

- The candidate must hold a PhD/DPhil in Physics, or a closely related field (it is acceptable to be in the final stages of PhD/DPhil program).
- The candidate must have a sound background in laser-plasma physics and diagnostics.
- The candidate should be familiar with plasma simulation codes and have good analytic skills.
- The candidate must be able to demonstrate a capacity for independent research work.
- The candidate should have good interpersonal and communication skills, and the ability to function as part of a team.
- The candidate should have a publication record commensurate with career stage.

Desirable

- Knowledge of astrophysical and space plasmas

The University's policy on retirement

The University operates an employer justified retirement age for all academic and academic-related posts (any grade above grade 5), 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/revisedejira/revaim/

For **existing** employees any employment beyond the retirement age is subject to approval through the procedures outlined at:

www.admin.ox.ac.uk/personnel/end/retirement/revisedejira/revproc/

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. All applicants must read the candidate notes on the University's pre-employment screening procedures, found at:

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

Working at the University of Oxford

For further information about working at Oxford, please see:

www.ox.ac.uk/about_the_university/jobs/research/

How to apply

Applications must be made online via: <https://academicjobsonline.org/ajo>

You will be required to upload a CV and brief statement of research interests OR supporting statement which explains how you meet the selection criteria for the post together with a publication list. Details of two referees should also be included (references will be submitted via Academic Jobs Online).

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 owing to the fact that he or she has 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*
- explain in your covering letter how you meet the selection criteria for the post.*

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 http://www.ox.ac.uk/about_the_university/jobs/support/

To return to the online application at any stage, please click on the following link

www.recruit.ox.ac.uk

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