DEPARTMENT OF PHYSICS

Job description and selection criteria

Job title	Postdoctoral Fellow in Radio Transients
Division	Mathematical, Physical & Life Sciences Division
Department	Department of Physics (Astrophysics)
Location	Denys Wilkinson Building, Keble Road, Oxford
Grade and salary	Grade 07S £29,837 - £36,661
Hours	Full time 37.5 hours per week
Contract type	Fixed term to 30 June 3016 (due to grant funding)
Reporting to	Professor Rob Fender
Vacancy reference	112861
Additional information	Closing Date: Friday 16 May (12 noon)

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 10,000 staff and has a student population of over 22,000.

Most staff are directly appointed and managed by one of the University's 130 departments or other units within a highly devolved operational structure - this includes over 6,500 'academic-related' staff (postgraduate research, computing, senior library, and administrative staff) and over 2,700 'support' staff (including clerical, library, technical, and manual staff). There are also over 1,600 academic staff (professors, readers, lecturers), whose appointments are in the main overseen by a combination of broader divisional and local faculty board/departmental structures. Academics are generally all also employed by one of the 38 constituent colleges of the University as well as by the central University itself.

Our annual income in 2012/13 was £1,086.9m. Oxford is one of Europe's most innovative and entrepreneurial universities: income from external research contracts exceeds £436.8m p.a., and more than 80 spin-off companies have been created.

For more information please visit www.ox.ac.uk/staff/about_the_university.html

Athena SWAN Charter

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 SWAN 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.

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. We have over 6,000 students and research staff, and generate over half of our funding from external research grants.

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 interdisciplinary in nature. We collaborate closely with colleagues in Oxford across the medical sciences, social sciences and humanities.

Today's scientific research not only crosses traditional subject boundaries, but also transcends national boundaries: MPLS scientists collaborate with researchers from around the world, and play leading roles in many international projects.

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

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://www.physics.ox.ac.uk/

Astrophysics Sub-department

The post-holder will be based in the Astrophysics 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.

The Head of Astrophysics is currently Professor Roger Davies**.** The Astrophysics sub-department consists of approximately 25 tenured research staff, 40 research fellows and associates, 45 graduate student and 5 support staff. In addition, we have a significant number of visiting academics and students for durations varying from 1 day to 1 year.

The Sub-Department has grown steadily in recent years. It is situated in the Denys Wilkinson Building, close to the centre of Oxford and the extensive University Parks. The site has excellent teaching and workshop facilities and a canteen on-site. Research is conducted into instrumental, observational, computational and theoretical astrophysics, and is supported by grants from a wide range of sources including: the Science and Technology Facilities Council, The European research Council, the Leverhulme Trust and the Royal Society.

The observational astrophysics programme at Oxford spans a wide range of topics from including cosmology and galaxy formation and evolution, the evolution of atomic and molecular gas, stellar dynamics and populations, high-redshift galaxies, the epoch of reionization, dark matter, and the physics of active galaxies and exotic objects. It also covers aspects of jet physics, pulsars, star formation and the interstellar medium and a growing activity in exoplanet research. The research is conducted on frontline telescopes around the world, including Chile and the United States, and on space telescopes.

Theoretical research groups study a range of topics including stellar evolution, cosmology, galaxy formation and evolution, dark matter, dark energy and gravitation. Data from a range of ground-based and satellite observatories are interpreted with simulations and increasingly realistic and complex models, and the development of novel techniques and approaches. The Beecroft Institute for Particle Astrophysics and Cosmology, which is located within the Denys Wilkinson Building, provides a focus for some of this activity.

We have an instrumentation programme to develop and construct innovative instruments for astronomical research. A number of visible, infrared and radio instruments have been deployed on telescopes, and design work is underway for the next generation of instruments, including systems for the proposed European Extremely Large Telescope and the Square Kilometre Array radio telescope. Detector and receiver developments are carried out in collaboration with the Oxford Engineering Science department, the Rutherford Appleton Laboratory and other institutes in the UK and around the world.

The Physics administration systems operate on MS Windows machines. Oxford Astrophysics computers run in support of a wide range of observational and numerical/theoretical research programmes. In addition to a multi-node cluster, researchers will typically each have a powerful desktop (running their choice of Mac OS X, linux or in some cases Windows). We benefit from the expertise of the Central Physics IT Support team.

Job description

Research topic	Radio Transients
Principal Investigator / supervisor	Professor Rob Fender
Project team	Astrophysics / 4 PI SKY
Project web site	
Funding partner	The funds supporting this research project are provided by ERC
Recent publications	
Technical skills	Radio Astronomy

Overview of the role

Developing commensal searching for radio transients (that is, the near-real-time searching of all data streams within minutes of acquistion, for new sources and/or strong variables) has been recently highlighted as a key component of the revised SKA phase 1 design. Such work is being pioneered by Fender and collaborators working with the South African SKA team, and is at the core goals of Fender's 4 PI SKY ERC project.

The proposed role is someone to work on developing this mode to (near-)operation for the MeerKAT telescope, in the 2nd half of the 4 PI SKY project, with a view to moving its implementation on to SKA_1 Mid in ~2018. We propose that the successful candidate have a ~50% technical commitment and ~50% available for scientific exploitation of results.

We further note that “matching” funding has been applied for from the South African SKA office, to provide additional funding beyond the end of Fender's ERC grant in June 2016

Responsibilities/duties

- Development of real-time commensal transient search modes for MeerKAT.
- Participate as an active member of Fender's 4 PI SKY team.
- Communicate new results to the wider community via regular technical forums; this may include regular travel to South Africa.
- Publish scientific results in international refereed journals.
- 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

- Hold, or be about to hold, a PhD/DPhil in Astronomy/Astrophysics.
- Some background in Radio Astronomy.
- Able to communicate clearly and work in, and communicate between, team, in particular between South Africa and the UK, and between scientists and engineers.
- A proven ability to meet deadlines and deliver to milestones. In particular to be able to develop and test a commensal transient-search system for the first stages of the MeerKAT project in parallel with the ongoing construction and scientific commissioning of the telescope en route to the SKA.

Desirable

- Experience in the astrophysics of explosive and transient phenomena, preferably in the radio band.
- Some experience with the MeerKAT radio telescopes (or similar), and an understanding of the development path towards the SKA
- Expertise in computing and/or handling and analysis of large data volumes.

Working at the University of Oxford

For further information about working at Oxford, please see: http://www.ox.ac.uk/about_the_university/jobs/research/

How to apply

If you consider that you meet the selection criteria, click on the **Apply Now** button on the 'Job Details' page and follow the on-screen instructions to register as a user. You will then be required to complete a number of screens with your application details, relating to your skills and experience. You will be required to upload a statement of research interests, curriculum vitae, list of publications and the names and addresses of three referees as part of your online application. In addition, candidates should arrange for their letters of reference to be sent to recruitment@astro.ox.ac.uk by the closing date above. Please ensure that your referees put the reference **112861** in the subject line. Your application will be judged solely on the basis of how you demonstrate that that you meet the selection criteria outlined above and we are happy to consider evidence of transferable skills or experience which you may have gained outside the context of paid employment or education. Please save all uploaded documents to show your name and the document type.

Applications are acknowledged but not referee letters. For informal enquiries about this post please contact Prof Rob Fender (Rob.Fender@astro.ox.ac.uk).

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 and this letter ***must*** *be attached to any application they submit.*

If you are applying for a post within the Department of Physics as a priority candidate, please contact the HR Manager at the following address to alert him to your application – j.gillic1@physics.ox.ac.uk

The priority application date for this post is *12 noon* **UK time on** *Friday 2 May 2014*

Full details of the priority application process are available at:
www.admin.ox.ac.uk/personnel/end/red/redproc/prioritycandidate

Should you experience any difficulties using the online application system, please email recruitment.support@admin.ox.ac.uk

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.