

Job Description and Selection Criteria

Job title	PDRA in CMB polarized foreground science
Division	Mathematical Physical and Life Sciences
Department	Physics (Astrophysics)
Location	Department of Physics, Denys Wilkinson Building
Grade and salary	Grade 07S: £36,024 - £44,263 per annum
Hours	Full time
Contract type	Fixed-term, 24 months
Reporting to	Prof. Angela Taylor
Vacancy reference	172146
Additional information	Closing date – midday on 3 rd May 2024

Research topic	RadioForegroundsPlus: CMB Foreground Science
Principal Investigator / supervisor	Prof. Angela Taylor
Project team	RadioForegroundsPlus
Project web site	https://research.iac.es/proyecto/radioforegroundsplus/
Funding partner	The funds supporting these positions research project are provided by the UKRI underwrite for the EU Horizon Europe project RadioForegroundsPlus (Grant Agreement number 101135036).
Recent publications	

The role

The successful candidate will join the Experimental Radio Cosmology and Observational Cosmology groups in Oxford working on the recently funded RadioForegroundsPlus project. The aim of RadioForegroundsPlus is to combine the nine Planck all-sky (30-857 GHz) maps, with three unique low-frequency data sets: the QUIJOTE maps (at 11, 13, 17 and 19 GHz), the C-BASS survey (at 5 GHz) and the S-PASS data (at 2.3 GHz) to provide the best possible characterization of the physical properties of polarized emissions in the microwave domain, together with an unprecedentedly thorough description of the intensity signal. This legacy information will be essential for future ground-based, sub-orbital or space experiments targeting the CMB B-Mode anisotropies. The project is coordinated by IFCA-CSIC (Spain) and, as well as the University of Oxford, the collaboration includes nodes at IAC (Spain), SISSA (Italy), CNRS (France) and Univ. of Manchester (UK). Full information on the project can be found at: <https://research.iac.es/proyecto/radioforegroundsplus/>.

The post in Oxford will primarily be focussed on:

- Data analysis and instrument characterization of the C-BASS experiment.
- Joint-analysis and cross-calibration of low-frequency foreground data from C-BASS, QUIJOTE and S-PASS.
- Science exploitation using the newly cross-calibrated, low-frequency foreground maps in conjunction with Planck CMB maps.
- Forecasting the impact of Galactic radio foregrounds on future CMB experiments.

The team at Oxford are also involved in other future and planned CMB and CMB Foregrounds experiments including LiteBIRD, Simons Observatory and the European Low Frequency Survey (ELFS). There will be opportunities for the successful candidate to work alongside these projects.

Good programming experience, an enthusiasm for coding and data analysis, and the ability to work in a large collaboration, are particularly relevant for this post.

Responsibilities

- Develop, test, and validate analysis techniques for the C-BASS experiment.
- Develop methods to cross-calibrate data from CBASS, QUIJOTE and S-PASS.
- Contribute to the science analyses of low-frequency foregrounds and legacy CMB data.
- Manage own academic research and administrative activities. This may involve small scale project management, to co-ordinate multiple aspects of work to meet deadlines
- Taking part in the academic life of the Astrophysics Group at the Physics Department, and in particular attending and taking part in seminars, colloquia and journal clubs.
- Contribute ideas for new research projects, and develop ideas for generating research income
- Take a leading role in the preparation of research publications
- Present papers at conferences or public meetings

- Represent the research network at external meetings/seminars
- Carry out collaborative projects with colleagues in RadioForegroundsPlus and other collaborations that the group is a member of
- The post-holder will have the opportunity to teach if desired. This may include lecturing, small group teaching, and tutoring of undergraduates and graduate students.

Pre-employment screening

All offers of employment are made subject to standard pre-employment screening, as applicable to the post.

If you are offered the post, you will be asked to provide proof of your right-to-work, your identity, and we will contact the referees you have nominated. You will also be asked to complete a health declaration (so that you can tell us about any health conditions or disabilities so that we can discuss appropriate adjustments with you), and a declaration of any unspent criminal convictions.

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/.

Selection criteria

- Hold, or be close to obtaining of, a Ph.D./D.Phil. degree.
- Possess sufficient specialist knowledge in the discipline to work within established research programmes
- Ability to manage own academic research and associated activities, and meet deadlines.
- Previous experience of contributing to publications/presentations
- Ability to contribute ideas for new research projects and research income generation
- Excellent communication skills, including the ability to write for publication, present research proposals and results, and represent the research network at meetings

Desirable selection criteria

- Good understanding of observational CMB and CMB foreground science
- Ability to initiate research in a lively group with significant interaction between theory, data analysis, and instrumentation
- Good coding skills
- Expertise in statistics and data analysis in areas of strong overlap with cosmology faculty members at 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, while providing all our staff with a welcoming and inclusive workplace that enables everyone to develop and do their best work. Recognising that diversity is our strength, 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 2016/17 exceeded £564m and we rank first in the UK for university spin-outs, with more than 130 companies created to date. We are also recognised as leaders in support for social enterprise.

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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.

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.

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

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/>

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.

How to apply

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 three referees and indicate whether we can contact them now.

You will also be asked to upload a CV and a supporting statement and details of two referees as part of your online application. **Your referees should be asked to send their letters, before the application deadline, to leanne.odonnell@physics.ox.ac.uk.**

The supporting statement must explain how you meet each of 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).

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.

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)

If you need help

Application FAQs, including technical troubleshooting advice is available at: <https://staff.web.ox.ac.uk/recruitment-support-faqs>

Non-technical questions about this job should be addressed to the recruiting department directly recruitment@physics.ox.ac.uk

To return to the online application at any stage, please go to: www.recruit.ox.ac.uk.

Please note that you will receive an automated email from our online recruitment portal to confirm receipt of your application. **Please check your spam/junk mail** if you do not receive this email.

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/.

Important information for candidates

Data Privacy

Please note that any personal data submitted to the University as part of the job application process will be processed in accordance with the GDPR and related UK data protection legislation. For further information, please see the University's Privacy Notice for Job Applicants at: <https://compliance.admin.ox.ac.uk/job-applicant-privacy-policy>. The University's Policy on Data Protection is available at: <https://compliance.admin.ox.ac.uk/data-protection-policy>.

The University's policy on retirement

The University operates an Employer Justified Retirement Age (EJRA) for very senior research posts at **grade RSIV/D35 and clinical equivalents E62 and E82**, which with effect from 1 October 2023 will be 30 September before the 70th birthday. The justification for this is explained at: <https://hr.admin.ox.ac.uk/the-ejra>.

For **existing** employees on these grades, any employment beyond the retirement age is subject to approval through the procedures: <https://hr.admin.ox.ac.uk/the-ejra>.

There is no normal or fixed age at which staff in posts at other grades have to retire. Staff at these grades may elect to retire in accordance with the rules of the applicable pension scheme, as may be amended from time to time.

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

Employee benefits

University employees enjoy 38 days' paid holiday, generous pension schemes, travel discounts, and a variety of professional development opportunities. Our range of other employee benefits and discounts also includes free entry to the Botanic Gardens and University colleges, and discounts at University museums. See <https://hr.admin.ox.ac.uk/staff-benefits>

University Club and sports facilities

Membership of the University Club is free for all University staff. The University Club offers social, sporting, and hospitality facilities. Staff can also use the University Sports Centre on Iffley Road at discounted rates, including a fitness centre, powerlifting room, and swimming pool. See www.club.ox.ac.uk and <https://www.sport.ox.ac.uk/>.

Information for staff new to Oxford

If you are relocating to Oxfordshire from overseas or elsewhere in the UK, the University's Welcome Service website includes practical information about settling in the area, including advice on relocation, accommodation, and local schools. See <https://welcome.ox.ac.uk/>. There is also a visa loan scheme to cover the costs of UK visa applications for staff and their dependants. See <https://staffimmigration.admin.ox.ac.uk/visa-loan-scheme>

Family-friendly benefits

With one of the most generous family leave schemes in the Higher Education sector, and a range of flexible working options, Oxford aims to be a family-friendly employer. We also subscribe to the Work+Family Space, a service that provides practical advice and support for employees who have caring responsibilities. The service offers a free telephone advice line, and the ability to book emergency back-up care for children, adult dependents and elderly relatives. See <https://hr.admin.ox.ac.uk/my-family-care>

The University has excellent childcare services, including five University nurseries as well as University-supported places at many other private nurseries.

For full details, including how to apply and the costs, see <https://childcare.admin.ox.ac.uk/>

Disabled staff

We are committed to supporting members of staff with disabilities or long-term health conditions. For further details, including information about how to make contact, in confidence, with the University's Staff Disability Advisor, see <https://edu.admin.ox.ac.uk/disability-support>

Staff networks

The University has a number of staff networks including the Oxford Research Staff Society, BME staff network, LGBT+ staff network and a disabled staff network. You can find more information at <https://edu.admin.ox.ac.uk/networks>

The University of Oxford Newcomers' Club

The University of Oxford Newcomers' Club is an organisation run by volunteers that aims to assist the partners of new staff settle into Oxford, and provides them with an opportunity to meet people and make connections in the local area. See www.newcomers.ox.ac.uk.