## Job Description and Selection Criteria

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| **Job title** | Postdoctoral Research Assistant in Climate Prediction |
| **Division** | Mathematical Physical and Life Sciences |
| **Department** | Physics |
| **Location** | Robert Hooke Building, Parks Road, Oxford, OX1 3PR |
| **Grade and salary** | Grade 7: £31,604 - £38,833 per annum |
| **Hours** | Full time (37 hours per week) |
| **Contract type** | Fixed-term for 36 months |
| **Reporting to** | Dr Antje Weisheimer |
| **Vacancy reference** | 131986 |
| **Additional information** | Closing date – midday (UK time) on Monday 15th January 2018 |

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| **Research topic** | Development of an innovative ensemble climate prediction system based on high-resolution climate models for Europe for the near-term (~1-40 years) including improved methods to characterise uncertainty in climate prediction, the assessment of forecast reliability across time scales and the generation of seamless climate predictions combining information from initialised and non-initialised climate simulations. |
| **Principal Investigator / supervisor** | Dr Antje Weisheimer |
| **Project team** | Prof Tim Palmer, Predictability of Weather and Climate group |
| **Project web site** | European Climate Prediction system (EUCP), coming soon Predictability of Weather and Climate group: http://www2.physics.ox.ac.uk/research/predictability-of-weather-and-climate |
| **Funding partner** | The funds supporting this research project are provided by the European Commission under their Horizon 2020 programme. |
| **Recent publications** | |

## The role

We are looking for an enthusiastic Postdoctoral Research Assistant to join our *Predictability of Weather and Climate* group within the sub-Department of Atmospheric, Oceanic and Planetary Physics (AOPP). The post will be available immediately for 3 years.

The offered position is funded by the European Commission's H2020 project EUCP (European Climate Prediction system) which will develop and demonstrate a climate prediction/projection system to inform and underpin decision making on the 1 to 40-year time horizon. It will make use of the best available information, in the face of uncertainty, on how the climate system is likely to respond to projected future emissions resulting from socio-economic changes, and how the predictions and projections can be constrained by initial-condition information. Depending on the user requirements, the climate data provided will range from individual plausible realisations or exemplars, to full probabilistic prediction and projection of future change.

The successful applicant is expected to work closely with other project partners and will take responsibility for the relevant research in Oxford, see detailed Responsibilities listed below. The results will be presented at national and international meetings as well as published in peer reviewed publications.

This post not only is an exciting opportunity to carry out original research in a highly society-relevant area of climate science in close collaboration with the leading European climate prediction and projection groups but also offers the prospects to develop independent scientific ideas.

## Responsibilities

The successful applicant will be responsible for the contribution of our group to the EUCP project. The job will involve the realisation of the following tasks:

- Evaluate forecast quality globally and locally in terms of skill and reliability on interannual to decadal time scales according to well-identified user requests using a multi-faceted forecast quality assessment.

- Investigate the relative merits of different methods for the representation of model uncertainties to produce more reliable and action-oriented climate predictions. They include the multi-model ensemble of opportunities, perturbing physical model parameters and stochastic approaches to account for uncertainties in physical parametrisations of sub-grid scale processes.

- Develop scientific methodologies to merge initialised predictions with non-initialised scenario projections on time scales of 1-40 years. This will include developing a better understanding of the skill in initialised and non-initialised global projections for overlapping prediction time scales including estimation of the prediction time until which the initialised predictions add skill compared to the non-initialised predictions, for different variables, seasons and the European focus region.

- Combine climate forecast information on different scales from global models and regional simulations and establish the added value of regional models. Employ techniques to blend information from global climate models with results of regional climate models, many of which use a decomposition of the local response in the regional climate models into circulation and non-circulation components, and use information from global climate models (e.g. circulation changes) to inform blending.

- Develop storylines and cases of plausible future weather consistent with the result of the combined forecasts across the full range of 1 to 40+ years by drawing on the initialised and non-initialised ensemble members. deriving new methods to construct small ensembles of realisations from the initialised simulations until the merge point in time. The approaches will include matching indices of the major modes of variability, especially those most relevant to the European region, from the two simulation periods, and compare power spectra of non-initialised simulation segments with those from the initialised runs in order to locate periods in the non-initialised runs that share common characteristics with the initialised forcing.

- Contribute to new research ideas

- 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**
- Good first degree in physics, mathematics or related sciences
- Doctorate (or be close to obtaining) in climate science, Mathematics, Physics, statistical science or related fields
- A sound knowledge of climate science including climate modelling and climate prediction, or some experience with statistical verification of ensemble predictions and/or big data analysis from other areas of science
- Background in statistical analysis of global climate data, including the proficiency in the use of statistical programming languages
- Very good Computing skills, including the knowledge of UNIX/Linux and python
- Demonstrate drive and ability to perform novel research of international standing
- Evidence of willingness to work closely with international partners
- The curiosity and ability to analyse complex phenomena and to summarise these findings in peer-reviewed publications
- An ability to work independently and in a team environment
- Excellent communication skills, including the ability to present results and represent the research group at meetings
- Ability to manage own project-related research and associated activities

**Desirable**
- Good understanding of the climate system including atmospheric physics and dynamics
- Knowledge and experience of ensemble forecast verification
- Knowledge and experience of uncertainty quantification

# 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, 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 2014/15 exceeded £522.9m 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.

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/

## Atmospheric, Oceanic & Planetary Physics (AOPP) Sub-department

The post-holder will be based in the AOPP 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

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 referees and indicate whether we can contact them now.

You will also be asked to upload a CV and a statement of research interests. 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.

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**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)*

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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 (EJRA) for all academic posts and some academic-related posts.  From 1 October 2017, the University has adopted an EJRA of 30 September before the 69th birthday for all academic and academic-related staff in posts at grade 8 and above. 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/

Form 1 October 2017, there is no normal or fixed age at which staff in posts at **grades 1–7** 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

## University Club and sports facilities

The University Club provides social, sporting and hospitality facilities. It incorporates a bar, café and sporting facilities, including a gym. 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 www.sport.ox.ac.uk/oxford-university-sports-facilities.

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

If you are relocating to Oxfordshire from overseas, or elsewhere in the UK, the University's International Staff website includes practical information related to moving to and settling in Oxford such as advice on immigration, relocation, accommodation, or registering with a doctor. See: www.internationalstaffwelcome.admin.ox.ac.uk/

## 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 to settle into Oxford and to provide them with an opportunity to meet people in the area. See www.newcomers.ox.ac.uk/

## Childcare

The University has excellent childcare services with 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 www.admin.ox.ac.uk/childcare.

## Family-friendly benefits

The University subscribes to My Family Care (www.admin.ox.ac.uk/personnel/staffinfo/benefits/family/mfc/) and staff are eligible to register for emergency back-up childcare and adultcare services, a 'speak to an expert' phone line and a wide range of guides and webinars through a website called the Work + Family space.

## Disabled staff

We are committed to supporting members of staff with disabilities or long-term health conditions. Please visit www.admin.ox.ac.uk/eop/disab/staff for further details including information about how to make contact, in confidence, with the University's Staff Disability Advisor.

## 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 www.admin.ox.ac.uk/eop/inpractice/networks/

## Other benefits

Staff can enjoy a range of other benefits such as free visitor access to the University's colleges and the Botanic Gardens as well as a range of discounts.
See www.admin.ox.ac.uk/personnel/staffinfo/benefits