

## Job Description and Selection Criteria

<b>Job title</b>	Postdoctoral Research Assistant in Single-molecule imaging of transcription kinetics
<b>Division</b>	Mathematical Physical and Life Sciences
<b>Department</b>	Physics
<b>Location</b>	Clarendon Laboratory, Parks road, Oxford
<b>Grade and salary</b>	Grade 07 £32,817 - £40,322 p.a.
<b>Hours</b>	<i>Full time</i>
<b>Contract type</b>	Fixed-term until 30 June 2023
<b>Reporting to</b>	Prof Achillefs Kapanidis
<b>Vacancy reference</b>	151773
<b>Additional information</b>	The closing date is 12 noon on 28 July 2021

<b>Research topic</b>	Single-molecule studies of gene transcription kinetics
<b>Principal Investigator / supervisor</b>	Prof Achillefs Kapanidis
<b>Project team</b>	Gene machines' group
<b>Project web site</b>	<a href="http://www.physics.ox.ac.uk/users/kapanidis/group/ResearchInterests.DNAP.html">http://www.physics.ox.ac.uk/users/kapanidis/group/ResearchInterests.DNAP.html</a>
<b>Funding partner</b>	The funds supporting this research project are provided by the Wellcome trust
<b>Recent publication</b>	Stracy M, Lesterlin C, Garza de Leon F, Uphoff S, Zawadzki P, Kapanidis AN. Live cell super-resolution microscopy reveals the organization of transcription machinery in the bacterial nucleoid. PNAS 2015, 112, E4390-9.



<p><b>S</b></p>	<p>Duchi D, Bauer D, Fernandez L, Evans GW, Robb N, Hwang LC, Gryte K, Tomescu A, Zawadzki P, Morichaud Z, Brodolin K, Kapanidis AN. RNA polymerase pausing during initial transcription. <i>Molecular Cell</i> 2016, 63(6):939-50.</p> <p>Dulin D, Bauer DLV, Malinen AM, Bakermans J, Kaller M, Morichaud Z, Petushkov I, Depken M, Brodolin K, Kulbachinskiy A and Kapanidis AN. Pausing controls branching between productive and non-productive pathways during initial transcription in bacteria. <i>Nature Comm</i>, 2018, 9, 1478.</p> <p>Duchi D, Mazumder A, Malinen A, Ebright RH, Kapanidis AN. The RNA polymerase clamp interconverts dynamically among three states and is stabilized in a partly closed state by ppGpp. <i>Nucleic Acids Res</i>, 2018, Jun 6. doi: 10.1093/nar/gky482.</p> <p>Craggs TD, Sustarsic M, Plochowitz A, Hohlbein J, Biggin P, Doye J, Kapanidis AN. Solution-based structure of a gapped DNA complex with DNA polymerase provide insight on DNA repair mechanisms <i>Nucleic Acids Res</i> 2019, gkz797, <a href="https://doi.org/10.1093/nar/gkz797">https://doi.org/10.1093/nar/gkz797</a>.</p> <p>Majumder A, Kapanidis AN, Ebright RH. Opening and closing of the RNA polymerase trigger loop PNAS 2020, 117, 15642-9. <a href="https://doi.org/10.1073/pnas.192042711.7">https://doi.org/10.1073/pnas.192042711.7</a></p> <p>Majumder A, Wang A, H Uhm, Ebright RH, Kapanidis AN. RNA polymerase clamp conformational dynamics: long-lived states and modulation by crowding, cations, and nonspecific DNA binding. <i>Nucleic Acids Research</i> 2021, 49, 2790-2802 (<a href="https://doi.org/10.1093/nar/gkab074">https://doi.org/10.1093/nar/gkab074</a>).</p>
<p><b>Technical skills</b></p>	<p>Biochemistry and molecular biology skills, protein-DNA interactions, transcription assays, single-molecule microscopy, image analysis, time-series analysis</p>

## The role

Member of the Gene Machines research group (led by Dr Achillefs Kapanidis) with responsibility for biochemical and single-molecule fluorescence studies within a project that studies mechanistic and kinetic aspects of gene transcription by RNA polymerase *in vitro*. The group will soon relocate to the Oxford Kavli Institute for Nanoscience Discovery (<https://kavlifoundation.org/institutes/kavli-institute-for-nanoscience-discovery>).

## Responsibilities

Manage own academic research and administrative activities. This involves small scale project management, to co-ordinate multiple aspects of work to meet deadlines

Adapt existing and develop new scientific techniques and experimental protocols

Test hypotheses and analyse scientific data from a variety of sources, reviewing and refining working hypotheses as appropriate

Contribute ideas for new research projects

Develop ideas for generating research income, and present detailed research proposals to senior researchers

Undertake comprehensive and systematic literature reviews and write up the results for publication in peer-reviewed journals

Collaborate in the preparation of scientific reports and journal articles and occasionally present papers and posters

Use specialist scientific equipment in a laboratory environment

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

Actively participate in group meetings and journal club meetings

The post-holder will have the opportunity to teach. 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/](http://www.ox.ac.uk/about/jobs/preemploymentscreening/).

### **Hazard-specific / Safety-critical duties [delete if not appropriate] See:**

[www.admin.ox.ac.uk/personnel/recruit/preempcheck/compulsorychecks/medical](http://www.admin.ox.ac.uk/personnel/recruit/preempcheck/compulsorychecks/medical)

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

- Work with any substance which has any of the following pictograms on their MSDS:



## **Selection criteria**

1. Hold a relevant PhD/DPhil in Biochemistry, Chemistry, Molecular Biology, Molecular Biophysics, or related field
2. Experience in DNA and RNA biochemistry, cloning and molecular biology techniques, protein expression and purification.
3. Experience with site-specific modification and labelling of protein and nucleic acids.
4. Expertise in enzyme kinetics
5. Familiarity with bacterial transcription mechanisms.
6. Expertise in using biophysical techniques to study protein-protein and/or protein-DNA interactions.
7. Experience with fluorescence spectroscopy and fluorescence-based assays
8. Experience with single-molecule microscopy and/or high-end microscopes.
9. Excellent communication skills, including the ability to write technical reports and scientific manuscripts for publication, present data at conferences, and represent the research group at meetings

## **Desirable**

1. Familiarity with single-molecule fluorescence methods, especially DNA-PAINT and/or single-molecule FRET
2. Familiarity with high-throughput approaches to study protein-DNA interactions and/or nucleic acid sequences
3. Familiarity with image analysis and single-molecule time-series analysis.
4. Publications in peer-reviewed journals and experience in publishing scientific articles and reports.
5. Experience working as part of a multidisciplinary team

## **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 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.

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](http://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.

### **CMP Sub-department**

The post-holder will be based in the CMP 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/](http://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 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.

### 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](mailto:recruitment.support@admin.ox.ac.uk). Further help and support is available from [www.ox.ac.uk/about the university/jobs/support/](http://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](http://www.recruit.ox.ac.uk).

Please note that you will receive an automated email from our e-recruitment system 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/](http://www.ox.ac.uk/about/jobs/preemploymentscreening/).

### 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: [www.admin.ox.ac.uk/councilsec/compliance/gdpr/privacynotices/job/](http://www.admin.ox.ac.uk/councilsec/compliance/gdpr/privacynotices/job/). The University's Policy on Data Protection is available at: [www.admin.ox.ac.uk/councilsec/compliance/gdpr/universitypolicyondataprotection/](http://www.admin.ox.ac.uk/councilsec/compliance/gdpr/universitypolicyondataprotection/).

### 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 69<sup>th</sup> 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/acrelretire8+/](http://www.admin.ox.ac.uk/personnel/end/retirement/acrelretire8+/).

For **existing** employees, any employment beyond the retirement age is subject to approval through the procedures: [www.admin.ox.ac.uk/personnel/end/retirement/acrelretire8+/](http://www.admin.ox.ac.uk/personnel/end/retirement/acrelretire8+/).

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

### 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 [www.admin.ox.ac.uk/personnel/staffinfo/benefits](http://www.admin.ox.ac.uk/personnel/staffinfo/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](http://www.club.ox.ac.uk) and [www.sport.ox.ac.uk/oxford-university-sports-facilities](http://www.sport.ox.ac.uk/oxford-university-sports-facilities).

### 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 [www.welcome.ox.ac.uk](http://www.welcome.ox.ac.uk). There is also a visa loan scheme to cover the costs of UK visa applications for staff and their dependents. See [www.admin.ox.ac.uk/personnel/permits/reimburse&loanscheme/](http://www.admin.ox.ac.uk/personnel/permits/reimburse&loanscheme/).

### 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 My Family Care, 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 [www.admin.ox.ac.uk/personnel/staffinfo/benefits/family/mfc/](http://www.admin.ox.ac.uk/personnel/staffinfo/benefits/family/mfc/).

### Childcare

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 [www.admin.ox.ac.uk/childcare/](http://www.admin.ox.ac.uk/childcare/).

### 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 [www.admin.ox.ac.uk/eop/disab/staff](http://www.admin.ox.ac.uk/eop/disab/staff).

### 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/](http://www.admin.ox.ac.uk/eop/inpractice/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](http://www.newcomers.ox.ac.uk).