## Job Description and Selection Criteria

<table>
<thead>
<tr>
<th><strong>Job title</strong></th>
<th>Postdoctoral Research Assistant in Cryptography</th>
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</thead>
<tbody>
<tr>
<td><strong>Division</strong></td>
<td>Mathematical, Physical and Life Sciences</td>
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<tr>
<td><strong>Department</strong></td>
<td>Mathematical Institute</td>
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<tr>
<td><strong>Location</strong></td>
<td>Andrew Wiles Building, Radcliffe Observatory Quarter, Woodstock Road, Oxford, OX2 6GG.</td>
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<tr>
<td><strong>Grade and salary</strong></td>
<td>Grade 7: salary £31,604 - £38,833 p.a.</td>
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<tr>
<td><strong>Hours</strong></td>
<td>Full time</td>
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<tr>
<td><strong>Contract type</strong></td>
<td>Fixed-term until 31 January 2021</td>
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<tr>
<td><strong>Reporting to</strong></td>
<td>Dr Ali El Kaafarani and Professor Peter Grindrod (or designated members for the Oxford mathematics faculty as appropriate)</td>
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<tr>
<td><strong>Vacancy reference</strong></td>
<td>132383</td>
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**Additional information**

- This position is subject to a 9 month probationary period.
- This is a full-time position that cannot be held concurrently with any other substantive post without the explicit permission of the Head of Department.
- This position is funded via the Emirates-Oxford Data Science Lab and is available from 1 Feb 2018 (or as soon as possible thereafter) and will terminate on 1st January 2021.
- (PLEASE NOTE: Applicants are responsible for contacting their referees and making sure that their letters are received by the closing date)

### The Oxford-Emirates Data Science Lab

The Emirates Group and the University of Oxford have entered into a strategic partnership to create the Oxford-Emirates Data Science Lab. The initial term of the agreement is five years.
and commenced on 1 Jan 2016. Work within the Lab will focus on data science projects and areas of research specific to Emirates Group and of scientific interest to Oxford.

Located within the Mathematical Institute, the Lab draws on data science, machine learning, cryptography, mathematics and big data science to help Emirates place data at the heart of their organisation and streamline their business processes. The Lab is tasked with a wide range of projects including projects that emanate from present operations such as revenue management and customer management and security, as well as projects developing novel concepts and methods from the leading edge of data science (including analytics, methods, analysis, learning, and social sciences) that can be applied to Emirates' data and support novel operations. Longer term, the Lab’s focus will be to redefine the customer experience through improved personalisation with individual customers.

Emirates is one of the largest, most innovative, and fastest growing airlines in the world, serving a constantly expanding network of more than 147 destinations on six continents. Emirates operates one of the youngest, most advanced and most environmentally friendly aircraft fleets in the industry.

The Roles

The University of Oxford has already appointed four PRDAs to the Lab specialising in network science, optimisation, and machine learning: and will now appoint a further six or seven PDRAs. One of these (described here) will be appointed within the Mathematical Institute, while other new PDRAs may be based within other departments, such as Computer Science, Engineering Science, and the Oxford Internet Institute for example, as appropriate. In addition to the PRDAs Emirates Airline has appointed two data scientists and a manager participating in the research work and offering the domain knowledge from airline industry, strong linkage to colleagues in Dubai, and practical applications of the data science. Professor Peter Grindrod directs the network of university researchers within the Lab.

We are seeking to appoint a full-time postdoctoral researcher to join the Cryptography Group at the Mathematical Institute, University of Oxford in association with the Oxford-Emirates Data Science Lab (OEDSL). This is a fixed-term position which will terminate on 1st January 2021 and is available from 1st of Feb 2018 or as soon as possible thereafter.

The successful candidate will take part in the research of the Cryptography Group and the Oxford-Emirate Data Science Lab (OEDSL) and will be based in the Mathematical Institute and will normally visit Emirates HQ in Dubai up to four times a year for a few days at a time.

In this role, the successful candidates will report to Dr Ali El Kaafarani, from the Cryptography Group and Professor Peter Grindrod, Oxford’s Director and PI for the OEDSL, or to other designated members for the Oxford mathematics faculty, as appropriate.

The successful candidate will spend approximately half their time working directly on OEDSL projects, defined from time to time, in collaboration with Emirates’ own data scientists within the OEDSL and at Group HQ, as well as Oxford faculty and other OEDSL PDRAs. They will each spend half their time working on their own research projects, as agreed with Dr Ali El Kaafarani, with the aim of becoming an independent researcher within the Cryptography Group. Funding will be available to attend some conferences, workshops, and so on, supporting the candidates’ own research that is unrelated to the Emirates Lab agenda. The candidates may co-supervise graduate projects and co-supervise DPhil projects as appropriate and agreed with Dr Ali El Kaafarani.
The successful candidates will take part in meetings, workshops, and presentations, both in Oxford and in Dubai, as directed by Professor Grindrod. They may also make proposals for new research projects and sub-projects that are appropriate to Emirates and with applications over appropriate Emirates data, usually within the corporate cloud environment.

All research involving Emirates’ staff and data will comply with the over-arching research agreement between the University of Oxford and the Emirates Group, and in particular permission must be sought from Professor Grindrod and Emirates’ own senior member of staff based in the OEDSL before exporting data, images, or results from the corporate cloud environment. Research carried out in collaboration with Emirates staff and/or exploiting Emirates’ knowledge and Emirates’ proprietary data should be agreed at the outset and will usually be freely publishable subject to agreement.

Candidates should have a recent PhD in computer science or a mathematical science related subject, with a strong cryptography/security background and a proven publication record. Candidates with experience in distributed ledger/blockchain technology/financial cryptography (Bitcoin, Ethereum, cryptocurrencies and smart contracts) are encouraged to apply.

Experience in privacy enhancing technologies is also desirable.

**Responsibilities**

- Manage own academic research and administrative activities. Contribute ideas and concepts for new collaborative research projects
- Develop ideas for generating research income, and present detailed research proposals to senior researchers
- Collaborate in the preparation of research publications, and book chapters
- Present papers at conferences or public meetings
- Act as a source of information and advice to other members of the relevant groups on methodologies or procedures
- Represent the research groups at external meetings/seminars, either with other members of the group or alone
- Carry out collaborative projects with colleagues within partner institutions, and research groups

It is the policy of the Mathematical Institute to give all PDRAs the opportunity to teach, where the conditions of the grant allow this, and to require teaching if there is a departmental need. Such teaching, if undertaken, will not exceed 3 hours per week for 24 weeks of the year and additional remuneration will be paid. It will normally be delivered as classes, but it might also involve giving lectures or college tutorials.
Selection criteria

- Hold a relevant PhD/DPhil, together with the relevant experience
- Possess sufficient specialist knowledge in the discipline to work within established research programmes
- Ability to manage own academic research and associated activities
- 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 group at meetings

Desirable

- Experience of working with corporate users and exploiters of mathematical research (collaboration with industry etc)
- Experience of actively collaborating in the development of research articles for publication

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
The Mathematical Institute

The Mathematical Institute, as Oxford’s Department of Mathematics is known, is one of the leading mathematics departments in the world. Our mathematical research, impact and environment were all ranked first in the UK in the 2014 Research Excellence Framework exercise, a government review of research in all UK universities. The Mathematical Institute is the focus of research into both fundamental mathematics and its applications, and our inclusive nature and overall size are key factors in the provision of an outstanding research environment for our members. The large number of faculty, postdocs and students in the Mathematical Institute, all supported by excellent facilities, allows us to maintain a critical mass in research groups encompassing a wide spectrum of mathematics, while our integrated nature fosters collaboration between fields. We also host a large number of academic visitors. Our web pages (www.maths.ox.ac.uk) provide comprehensive information about all of our activities.

The research activities of the Institute as a whole can be gauged from the web pages of the research groups and centres within the Institute (www.maths.ox.ac.uk/research). The range of our research interests is well reflected by the profile of our faculty as listed at www.maths.ox.ac.uk/people. Many members of the Institute have received prestigious prizes and other special recognition for their work; some recent examples can be found at www.maths.ox.ac.uk/news/awards-and-prizes.

The Mathematical Institute moved into the purpose-built Andrew Wiles Building in the University's Radcliffe Observatory Quarter in September 2013. As well as providing offices for all staff and graduate students, it houses a range of other facilities available to members of the department, including the Whitehead Library, a large range of meeting rooms, teaching spaces, lecture rooms, and social spaces, and a small facility for carrying out table-top experiments. For more information, see www.maths.ox.ac.uk/about-us.

Teaching is central to the life of the Mathematical Institute and we have an annual intake of approximately 300 undergraduates, some on courses jointly with other departments. We admit 100 students each year across five taught master’s degree courses and have over 230 doctoral students in residence at any one time. Our doctoral programme always attracts the best research students from across the world, and we have a broad mentoring and training programme. Our provision expanded in 2014 following the award of two EPSRC-funded Centres for Doctoral Training.

The Mathematical Institute strives to ensure that all staff and students are given the opportunities and support they need to achieve their potential. We are committed to equality of opportunities and to advancing women’s careers. We support staff returning from long-term absence and provide flexible arrangements for staff with parental responsibilities. Further information about family support can be found in the Standard Terms and Conditions. Our Good Practice Committee contributes to many aspects of our work, see www.maths.ox.ac.uk/members/good-practice.

As part of the department’s commitment to openness, inclusivity and transparency, we strongly encourage applications from all who consider they meet the requirements of the post, and particularly from women and ethnic minorities.

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1 The Mathematical Institute was a founding supporter of the London Mathematical Society’s Good Practice Scheme (www.lms.ac.uk/women/good-practice-scheme) and have recently been awarded an Athena SWAN silver award.
MPLS Division

The university's Division of Mathematical Physical and Life sciences contains departments that span the full spectrum of the mathematical, computational, physical, engineering and life sciences. Between them, they undertake a huge range of fundamental research and develop application that respond to the great societal and technological challenges of our time. Research across the Division is increasingly interdisciplinary in nature.

MPLS's scientists collaborate closely with colleagues in other Divisions across Oxford, with other universities, research organisations and industrial partners across the globe.

Our senior researchers have been awarded some of the most significant scientific honours (including Nobel prizes and prestigious titles such as FRS and FREng). The Division is equally proud of its tradition of attracting and nurturing the very best early career researchers, many of whom regularly secure prestigious fellowships.

The Division holds six Athena Swan Awards (four silver and two bronze) illustrating its commitment to encouraging women in science research and careers.

For more information visit http://www.mpls.ox.ac.uk/about/about-mpls-division

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. You will also be required to upload a curriculum vitae, list of publications, a statement of research interests and supporting statement. The supporting statement should describe how you meet the selection criteria outlined in the job description.

Please also provide details of two referees, one should include the applicant's current or most recent employer, whenever possible and indicate whether we can contact them now.

Please upload all documents as PDF files with your name and the document type in the filename.

Applicants should ask their referees to send their letters of reference DIRECTLY to

The Recruitment Administrator (Vacancies)
The Mathematical Institute, Andrew Wiles Building, Radcliffe Observatory Quarter, Woodstock Road, Oxford, OX2 6GG. Tel: 01865 273525: Email: vacancies@maths.ox.ac.uk

by the closing date (a letter by email is sufficient) quoting the vacancy reference 132383. Referees should preferably not be from the same institution and whenever possible one should be the applicant’s current, or most recent, supervisor. NOTE: reference letters must be received from your referees by the closing date for your application to be complete.

All applications must be received by 12:00 noon UK time on Thursday 15th February 2018
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. 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/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/+.

From 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](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 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/](http://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/](http://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](http://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/](http://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](http://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/](http://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](http://www.admin.ox.ac.uk/personnel/staffinfo/benefits)