Job Description and Selection Criteria

**Job title**  Postdoctoral Research Assistant in Computational Stochastics

**Division**  Mathematical, Physical and Life Sciences

**Department**  Mathematical Institute

**Location**  Andrew Wiles Building, Radcliffe Observatory Quarter, Woodstock Road, Oxford, OX2 6GG.

**Grade and salary**  Grade 7: salary £31,076 - £38,183 p.a.

**Hours**  Full time

**Contract type**  Fixed-term 36 months

**Reporting to**  Professor Mike Giles

**Vacancy reference**  129486

**Additional information**  This position is subject to a 9 month probationary period.

This position is funded by EPSRC and is available from 1st Jan 2018 (or as soon as possible thereafter)

(PLEASE NOTE: Applicants are responsible for contacting their referees and making sure that their letters are received by the closing date)

The Role

The position is funded through the EPSRC Programme Grant - Inference, Computation and Numerics for Insights into Cities (ICONIC) EP/P020720/1. ICONIC is a new 5-year Programme Grant led by Prof. Mark Girolami at Imperial College in collaboration with Prof. Mike Giles in the University of Oxford, Prof. Nick Higham at the University of Manchester, and Prof. Des Higham at the University of Strathclyde.

ICONIC brings together a research team with a unique combination of skills in modeling, numerical analysis, statistics and high performance computing. To give a concrete target for impact, the ICONIC project will focus initially on Uncertainty Quantification for mathematical models relating to crime, security and resilience in urban environments. Then, acknowledging that urban analytics is a very fast-moving field where new technologies and data sources emerge rapidly, and exploiting the flexibility built into an EPSRC programme grant, we will apply the new tools to related city topics concerning human mobility, transport and infrastructure. In this way, the project will enhance the UK’s research capabilities in the fast-moving and globally
significant Future Cities field. Further information is available on the project website: http://iconicmath.org.

The initial focus of the research in Oxford will involve the development and analysis of multilevel Monte Carlo (MLMC) methods applied to the numerical approximation of stochastic PDEs, coupled systems of SDEs and other stochastic models developed at Imperial and Strathclyde. This will include the development of open-source parallel High Performance Computing (HPC) codes on the latest hardware such as GPUs and the Intel Xeon Phi. There may also be some joint supervision of a PhD student who will be researching the use of MLMC with mixed precision arithmetic and approximate random number generators.

The Appointment

We invite applications for a Postdoctoral Research Assistant position, funded by EPSRC, to work with Professor Mike Giles at the Mathematical Institute, University of Oxford. This is a 3 year fixed term position and is available from 1st Jan 2018 (or as soon as possible thereafter).

Responsibilities/duties

The successful candidate will perform mathematical research and develop open source computational software as a member of the ICONIC project. They will write this up for publication and presentation at conferences, and will participate in the activities of the local Oxford research community (particularly the Numerical Analysis Group) as well as the wider ICONIC project group. There is also a requirement to teach up to four sets of undergraduate or graduate classes per year, determined by the demand for classes in specific areas.

The successful candidate will be expected to:

- To undertake research on topics within the project under the leadership of Professor Mike Giles, including the development of open source software
- To participate fully in meetings of the ICONIC project group, and work collaboratively with the researchers at Imperial, Manchester and Strathclyde, travelling to these locations as required
- To participate in relevant activities within the Oxford research community, including assisting with the organisation of internal seminars and the supervision of students
- To disseminate the research results through publications, the project website, and presentations at conferences
- To contribute to general project management, such as organising project meetings

Selection criteria

An ideal candidate would have experience of Multilevel Monte Carlo methods, and would be very knowledgeable about both numerical methods for PDEs and high performance computing. However, this specific combination of skills is rare, so a good candidate should have some knowledge in some of these areas, and a clear willingness and ability to learn about the other areas.

Accordingly, the successful candidate will be expected to meet the following essential criteria:

- A PhD (awarded, submitted or about to be submitted) in mathematics or a related discipline, or equivalent professional expertise and/or qualifications
• **Expert knowledge in at least one of the following three areas:**
  i) Monte Carlo methods for stochastic models
  ii) numerical methods for partial differential equations
  iii) high performance computing for scientific applications
• **Demonstrated skills in software development**
• **Good communication skills, both written and oral**
• **Proven ability to work independently, and also as a member of a research team**

In addition, the following criteria are desirable:
• **knowledge in the other two technical areas listed above**
• **experience with stochastic modelling and/or stochastic numerical analysis**
• **knowledge of GPU computing and/or vectorisation on CPUs**
• **experience with Git or other version control software for project management**

**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, and in providing all of our staff with a welcoming and inclusive workplace that supports everyone to develop and do their best work. Recognising that diversity is a great strength, and 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 ranked first in the UK for university spin-outs, with more than 130 spin-off 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)

**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](http://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](http://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\(^1\) 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.

**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.

\(^1\) 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.
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 quoting reference number.

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

The Administrative Assistant (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 129486
Referees should preferably not be from the same institution and whenever possible one should be the applicant's current, or most recent, supervisor. NOTE: referees 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 Monday 7th August 2017

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 for all academic and academic-related posts (grade 6 and above), for which the retirement date is the 30 September immediately preceding the 68th birthday. 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/

There is no normal or fixed age at which support staff in posts at grades 1–5 have to retire. Support staff may retire once they reach the minimum pension age stipulated in the Rules of the pension scheme to which they belong.

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

**Training and Development**
A range of training and development opportunities are available at the University. Further details can be found at [www.ox.ac.uk/staff/working_at_oxford/training_development/index.html](http://www.ox.ac.uk/staff/working_at_oxford/training_development/index.html).

**For research staff only: Support for Research Staff**
There is a particularly wide range of support for career development for research staff. Please visit [www.ox.ac.uk/research/support-researchers](http://www.ox.ac.uk/research/support-researchers) to find out more.

**Pensions**
The University offers generous occupational pension schemes for eligible staff members. Further details can be found at [www.admin.ox.ac.uk/finance/epp/pensions/pensionspolicy/](http://www.admin.ox.ac.uk/finance/epp/pensions/pensionspolicy/).

**Information for international staff (or those relocating from another part of the UK)**
A wealth of information is available on the University’s International Staff website for staff who are relocating to Oxford from abroad, at [www.admin.ox.ac.uk/personnel/staffinfo/international/](http://www.admin.ox.ac.uk/personnel/staffinfo/international/).

**The University of Oxford Newcomers’ Club**
The Newcomers’ Club is aimed at helping partners of newly-arrived visiting scholars, graduate students and academic members of the University to settle in and to meet people in Oxford.

**Transport schemes**
The University offers a range of travel schemes and public transport travel discounts to staff. Full details are available at [www.admin.ox.ac.uk/estates/ourservices/travel/](http://www.admin.ox.ac.uk/estates/ourservices/travel/).

**University Club and University Sports Facilities**
The University Club provides social, sporting and hospitality facilities. It incorporates a Club bar, a cafe and sporting facilities, including a gym. See [www.club.ox.ac.uk](http://www.club.ox.ac.uk) for all further details.

University staff can use the University Sports Centre at discounted rates, and have the chance to join sports clubs. Please visit [www.sport.ox.ac.uk/oxford-university-sports-facilities](http://www.sport.ox.ac.uk/oxford-university-sports-facilities).

**Childcare and Childcare Vouchers**
The University offers quality childcare provision services at affordable prices to its employees. For full details about the services offered, please visit [www.admin.ox.ac.uk/childcare/](http://www.admin.ox.ac.uk/childcare/). **NB: Due to the high demand for the University’s nursery places there is a long waiting list.**

The University also offers nursery fee payment schemes to eligible staff as an opportunity to save tax and national insurance on childcare costs. Please visit [www.admin.ox.ac.uk/childcare](http://www.admin.ox.ac.uk/childcare).

**Disabled staff**
The University is committed to supporting members of staff with a disability or long-term health condition and has a dedicated Staff Disability Advisor. Please visit [www.admin.ox.ac.uk/eop/disab/staff](http://www.admin.ox.ac.uk/eop/disab/staff) for further details.

**BUPA - Eduhealth**
Bupa Eduhealth Essentials private medical insurance offers special rates for University of Oxford staff and their families [www.eduhealth.co.uk/mini-site/](http://www.eduhealth.co.uk/mini-site/).

**All other benefits**
For other benefits, such as free entry to colleges, the Botanic Gardens and staff discounts offered by third party companies, please see [www.admin.ox.ac.uk/personnel/staffinfo/benefits/](http://www.admin.ox.ac.uk/personnel/staffinfo/benefits/).