Job Description and Selection Criteria

<table>
<thead>
<tr>
<th>Job title</th>
<th>Senior Research Fellow in Quantum Information Theory</th>
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<tbody>
<tr>
<td>Division</td>
<td>Mathematical, Physical and Life Sciences</td>
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<tr>
<td>Department</td>
<td>Mathematical Institute</td>
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<tr>
<td>Location</td>
<td>Andrew Wiles Building, Radcliffe Observatory Quarter, Woodstock Road, Oxford, OX2 6GG</td>
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<tr>
<td>Grade and salary</td>
<td>Grade 9: salary £51,306 - £59,450 p.a. (with a discretionary range up to £64,946)</td>
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<tr>
<td>Hours</td>
<td>Full time (37.5 hours per week)</td>
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<tr>
<td>Contract type</td>
<td>Permanent</td>
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<tr>
<td>Reporting to</td>
<td>Head of Department</td>
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<tr>
<td>Vacancy reference</td>
<td>166162</td>
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<tr>
<td>Additional information</td>
<td>This post is subject to a 2-year probationary period.</td>
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</table>

Applications are invited for the post of Senior Research Fellow in Quantum Information Theory. The successful candidate must have a doctorate in mathematics or a closely related subject and a record of outstanding research in quantum information theory. The appointee will have the ability to teach effectively over a wide range of topics in the undergraduate mathematics syllabus at Oxford, as well as the MSc in Mathematical and Theoretical Physics, in both classes and lectures.

The SRF will advance education (teaching and research) in the field of Quantum Information Theory. In addition to leading independent research within a broad programme in this area, the SRF will contribute to the teaching, research and academic administration of the Mathematical Institute.

If desired, we are open to exploring ways that the successful candidate might combine this academic role with experiences in the commercial sector.

Duties of the post

The SRF will be part of a lively and intellectually stimulating research community which performs to the highest international levels in research and publications and will have access to the excellent research facilities which Oxford offers.
The main duties of the post are as follows:

Research

• to engage in original research in the field of the mathematics of Quantum Information Theory;
• to secure research funding and engage in the management of research projects;
• to disseminate their research through publication in scholarly journals, participation in international conferences and seminars, and through other media;
• to engage in knowledge transfer activities.

Teaching

• to carry out teaching at undergraduate and graduate level under the direction of the Head of Department. The requirement will normally be to deliver two 16-hour lecture courses per year and serve as tutor for 12 sets of intercollegiate classes (subject to variation as agreed with the Head of Department);
• to supervise research and MSc students.

Examining

• to take part in University examining as and when requested to do so.

Administration

• to participate in the administration of the department as and when requested by the Head of Department.

Selection Criteria

Your application will be judged only against the criteria which are set out below. You should ensure that your application shows clearly how your skills and experience meet these criteria.

The Selection Committee for this process is expected to comprise;

Professor James Sparks (Chair)
Professor Jon Keating FRS
Professor Artur Ekert FRS
Professor Simon Benjamin (Department of Materials, Oxford)
Professor Elham Kashefi (University of Edinburgh)
Professor Barbara Terhal TBC (Delft University of Technology)

The University is committed to fairness, consistency and transparency in selection decisions. Members of the selection committee are aware of the principles of equality of opportunity, fair selection and the risks of bias.
If, for any reason, you have taken a career break, parental leave or have had an atypical career and wish to disclose this in your application, the selection committee will take this into account, recognising that the quantity of your experience may be reduced as a result.

The successful candidate will demonstrate the following.

**Essential**

(a) A doctorate in mathematics or a closely related subject;
(b) The proven ability and/or potential to carry out high quality independent research at an international level, as evidenced by, for example, publications in leading international journals and international research collaborations; and a track record of working across disciplines contributing to Quantum Information Theory
(c) The ability to attract research funding, with evidence (commensurate with career stage) of an excellent track record in obtaining research grants;
(d) The ability to communicate and disseminate research, as evidenced, for example, by invitation to and participation in conferences, seminars and research workshops;
(e) A demonstrated ability to teach effectively, in particular:
   - in undergraduate and graduate lectures, not exclusively in the area of their research expertise;
   - in problem classes or small groups on a broad range of topics in the undergraduate mathematics syllabus;
(f) The ability to supervise graduate students;
(g) The interpersonal skills necessary for undertaking tutorial teaching and the pastoral care of students;
(h) The ability and willingness to undertake the full range of administrative duties within the department.

**Pre-employment screening**

**Standard checks**

If you are offered the post, the offer will be subject to standard pre-employment checks. You will be asked to provide: proof of your right-to-work in the UK; proof of your identity; and (if we haven’t done so already) 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 for which you may need us to make appropriate adjustments.

Please read the candidate notes on the University’s pre-employment screening procedures at: https://www.jobs.ox.ac.uk/pre-employment-checks

**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 and we rank first in the UK for university spin-outs, and in recent years we have spun out 15-20 new companies every year. 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 have twice been ranked first in the UK, in the 2021 and 2014 Research Excellence Framework exercises, 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.

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 laboratory 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 around 900 undergraduates on course, some on joint courses with other departments. We teach around 250 students each year across five taught master’s degree courses, and have over 250 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.
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 with teaching relief, offer flexible working arrangements, and the department sponsors University nursery places to support the priority allocation of childcare to our staff. Further information about family support can be found below under University Benefits, Terms and Conditions. Our [Equality, Diversity & Inclusion Committee](#) contributes to many aspects of our work.

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.

We have a number of family-friendly policies, such as the right to apply for flexible working, hybrid working, and support for staff returning from periods of extended absence. We are committed to ensuring an inclusive interview process and will reimburse up to £250 towards any additional care costs (for a dependent child or adult) incurred as a result of attending an interview for this position, which may not be applicable if the interviews are held remotely.

For more information on the Mathematical Institute, please visit: [www.maths.ox.ac.uk](http://www.maths.ox.ac.uk)

The Mathematical Institute holds a silver Athena Swan award to recognise advancement of gender equality: representation, progression and success for all.

**QUANTUM INFORMATION THEORY IN OXFORD**

Oxford University has a rich history in quantum Information science, spanning both theoretical and experimental exploration. It is home to a vibrant, interdisciplinary community that has made significant contributions to the field, including pioneering developments in quantum computing, quantum cryptography, and quantum error correction. Integral to these breakthroughs, researchers from the Mathematical Institute continue to set the agenda and shape the future of the broadly defined quantum information theory.

Researchers at Oxford who work on theoretical aspects of quantum information science include Professors David Deutsch and Artur Ekert.

**MPLS Division**

The Mathematical, Physical, and Life Sciences (MPLS) Division is one of the four academic divisions of the University. Oxford is widely recognised as one of the world’s leading science universities and the MPLS Division is home to our non-medical sciences, with 10 academic departments that 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 tackles major societal and technological challenges – whether developing new energy solutions or improved cancer treatments, understanding climate change processes, or helping to preserve biodiversity, 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.

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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](http://www.lms.ac.uk/women/good-practice-scheme)). We have held an Athena SWAN Silver Award since 2016.
The disciplines within the MPLS Division regularly appear at the highest levels in rankings, including the Times Higher Education and QS world rankings. Nationally, the quality of the Division’s research outputs and environment, and the resulting impact, was recognised through strong performances in the UK Research Excellence Framework in both 2014 and 2021.

MPLS is proud to be the home of some of the most creative and innovative scientific thinkers and leaders working in academe. Our senior researchers have been awarded some of the most significant scientific honours and we have a strong tradition of attracting and nurturing the very best early career researchers who regularly secure prestigious fellowships and faculty positions. MPLS continues in its work to support diversity in its staffing, seeing that it will bring benefits to all, and we are pleased to note that all academic departments in the Division hold Athena Swan Awards.

We have around 7,300 full and part-time students (including approximately 3,400 graduate students) and play a major role in training the next generation of leading scientists. Oxford's international reputation for excellence in teaching is reflected in its position at the top of the major league tables and subject assessments. MPLS academics educate students of high academic merit and potential from all over the world. Through a mixture of lectures, practical work and the distinctive college tutorial system, students develop their ability to solve diverse mathematical, scientific and engineering problems.

MPLS is dedicated to bringing the wonder and potential of science to the attention of audiences far beyond the world of academia. We have a strong commitment to supporting public engagement in science through initiatives including the Oxford Sparks portal (www.oxfordsparks.ox.ac.uk) and a large variety of outreach activities; these are crucial activities given so many societal and technological issues demand an understanding of the science that underpins them. We also bring the potential of our scientific efforts forward for practical and beneficial application to the real world and our desire, aided by the work of Oxford University Innovation and Oxford Sciences Innovation, is to link our best scientific minds with industry and public policy makers.

For more information about the MPLS division, please visit: www.mpls.ox.ac.uk

**How to apply**

Applications are made through our online recruitment portal. Information about how to apply is available on our Jobs website [https://www.jobs.ox.ac.uk/how-to-apply](https://www.jobs.ox.ac.uk/how-to-apply).

Your application will be judged solely on the basis of how you demonstrate that you meet the selection criteria stated in the job description.

As part of your application you will be asked to provide details of three referees and indicate whether we can contact them now.

You will be asked to upload a CV, list of publications, details of teaching experience, a statement of research interests and a supporting statement. 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 quoting reference number 166162.

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

The Recruitment Coordinator (Vacancies)
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 166162.

Referees should preferably not, all 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 Monday 31st July 2023

Interviews are anticipated to take place in the week commencing Monday 11th September 2023.

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)

DATA PROTECTION: All data supplied by applicants will be used only for the purposes of determining their suitability for the post, and will be held in accordance with the principles of the Data Protection Act 1998 and the department’s data protection policy. https://www.maths.ox.ac.uk/members/policies/data-protection/statement

Due to the large volume of recruitment that the department administers we are unable to provide feedback to non-shortlisted applicants.

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 at vacancies@maths.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

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 R5IV/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](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](http://www.club.ox.ac.uk) and [https://www.sport.ox.ac.uk/](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/](https://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 [https://staffimmigration.admin.ox.ac.uk/visa-loan-scheme](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](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/](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](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](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](http://www.newcomers.ox.ac.uk).