

Assistant/Associate Professor in the Physics of Energy Materials

Department of Physics

Closing date: 15th October 2024

Job Reference: KA42829



The role

Salary:

£45,585 - £57,696 (Grade 9) or
£61,198 - £64,914 (Grade 10)

Contract:

Permanent

Location:

West Cambridge

Department:

Physics

Responsible to:

Head of Department

Working pattern:

Full-time

Start date:

From 1st April 2025

Role Summary

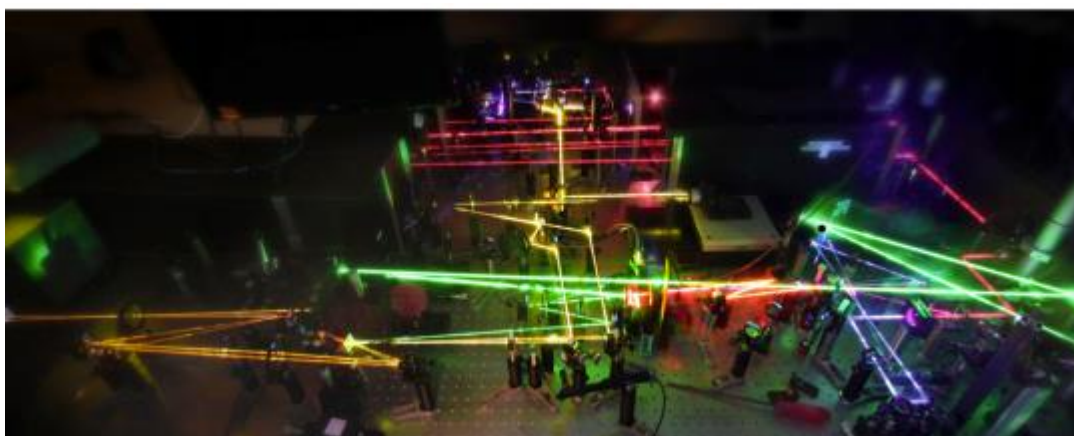
The Cavendish Laboratory, Department of Physics invites applications for a University Assistant Professor/ University Associate Professor position in the Physics of Energy Materials.

The Department is looking for an exceptional early career scientist to develop an ambitious experimental programme in the Physics of Energy Materials. The Energy Materials program at the Cavendish seeks to develop and support physics which can transform the way the world generates, stores and uses energy. We recognise that such breakthroughs must be underpinned by foundational physics that explores new physical mechanisms, new materials and new experimental techniques that can unlock the potential of these materials.

Current work at the Cavendish includes research into photovoltaics, LEDs, batteries, photocatalysis, thermoelectrics, plasmonics, superconductivity and spintronics. The department collaborates extensively with the wider activity in Energy Materials across the University. We seek exceptional candidates, whose research falls within the area of Energy Materials, broadly interpreted, to complement and further the work of the Cavendish. Illustrative examples of possible areas of interest for this position include, but are not limited to: the advanced characterisation of energy materials (perhaps leveraging large facilities); the study of novel physical concepts in energy conversion processes such as the control and application of light-matter coupling for photocatalysis and photovoltaics; or, new approaches, based on novel physics or new materials, to reduce energy consumption in data processing and storage.

The Assistant/Associate Professor post will be associated with our new 'Advanced Materials for the Energy Transition' (AMET) Taught MPhil Programme, which is a joint course with the Departments of Materials Science and Chemistry at the University of Cambridge. The successful candidate will be involved in the running of the MPhil with tasks including: course management; the admission of students; creation and delivery of some lectures; examining; and running projects. We are expecting between 20-30 students to be admitted to the new MPhil from October 2025. As for all our academic staff, they will also support teaching and administration at other levels in the department.

Applicants should have an undergraduate degree and a PhD in physics (or a cognate discipline), a strong record of relevant research, and must show evidence of enthusiasm and ability to teach a wide range of physics courses successfully at both undergraduate and master's level.



The role

The Department is active in promoting policies to address historic under-representation of women and minority groups in its workforce. We are proud to hold an Athena Swan Silver award for our work on equality and diversity. Candidates from under-represented groups, as well as candidates with a track record in addressing barriers to equality and diversity in education are particularly encouraged to apply

Key responsibilities

The successful candidates will develop a research programme in Energy Materials. In addition to research, the successful candidate will contribute to the AMET Taught MPhil and will be involved in the wider teaching needs of the Department at undergraduate and postgraduate levels.

Research: Further the subject by research and other activities which enhance its growth as a field of scholarship, including producing publications and submitting grant applications.

Teaching: This post is associated with the new AMET Taught MPhil, and the successful candidate will be involved in the following: course management; student admission; the development and delivery of courses; supervising laboratory classes and projects; and examination duties (setting and marking). As for all our academic staff, the successful candidate will also support teaching and administration at other levels in the department.

Other duties: General contribution to the academic work of the University commensurate with interests and skills, and the requirements of the Department.

Application process: Applicants should submit the following documents with their application:

- Curriculum Vitae (CV)
- A full list of publications. Please highlight up to 5 papers where you have made the most significant personal contributions, with up to 4 lines of text for each such paper.
- A research proposal no longer than 3 pages, including a brief description (of not more than half a page) of how your research plans might fit with existing activities at the Department of Physics and the wider University.
- A one-page statement on your approach to teaching and how you believe you can contribute to the Department's teaching programme at undergraduate and graduate level.
- The contact details of three referees.

The deadline for applications is 30th October 2024. Shortlisted applicants will be informed at the end of November 2024. They will be invited to visit Cambridge in January 2025. They will visit the department and have informal discussions with faculty, give a presentation, as well as attend the formal interview.

The position is available from 1st April 2025. There is some flexibility on the start date, which can be negotiated at the appointment stage. For informal enquiries please contact Prof Akshay Rao (ar525@cam.ac.uk)



Person specification

Essential

Desirable

Educated to degree level, with a PhD in Physics, or a closely related discipline and sufficient breadth and/or depth of knowledge to be able to teach Physics at a high standard at postgraduate and undergraduate levels.

✓

Evidence of excellence in research including a developing bibliography of research publications and the potential to develop a research programme to strengthen and complement existing research fields in the Department.

✓

A strong track record of research in the area of Physics of Energy Materials.

✓

Evidence of successful teaching of Physics at undergraduate and postgraduate level.

✓

Willingness to contribute to the academic administration of the Department.

✓

Evidence of a collaborative approach to research, including work in international teams.

✓

Demonstrable commitment to the Department's Athena SWAN aspirations concerning the advancement of women's careers in science, and to the University's wider commitment to equality, diversity and inclusion.

✓

In addition to the above criteria, applications at the level of Associate Professor will be expected to show evidence of the following;

Consistently conducts research addressing significant questions, and advancing the boundaries of the field.

✓

Consistently delivers excellent teaching that benefits from and engages with a research-rich environment and is intellectually challenging

✓

Consistently delivers high-quality research supervision and ensures that early-career researchers receive opportunities to develop their potential

✓

Consistently makes an effective contribution to the wider academic community and promotes collegiality

✓

✓

The Cavendish Laboratory



The Cavendish Laboratory (Department of Physics) was founded in 1871, with the simultaneous appointment of James Clerk Maxwell as the first Cavendish Professor. It has a distinguished history of contribution to science. Thirty-three Nobel prize winners have worked for considerable periods within the Laboratory, and the Cavendish is associated with many notable discoveries, including the identification of the electron and the neutron, determining the structure of DNA, and the discovery of pulsars.

A new era is beginning for Physics at Cambridge, with construction work underway for a new purpose-built centre for world-leading research, replacing our current buildings which date from 1971. The new building, the Ray Dolby Centre, and our strategic plan, both represent a renaissance in the way we carry out physics research and achieve our research goals. The spirit of adventure and innovation will be fostered in the Cavendish tradition, but adapted to the new needs of frontier research.

About the Department

At the heart of the new approach is a more flexible alignment of our research activities into research themes. This change of emphasis has been inspired by a number of changes in the nature of contemporary physics research. (see: <https://www.phy.cam.ac.uk/research>) In addition to serving as a home for physics research at Cambridge, the new Cavendish Laboratory will be a top-class facility for the nation - much of the specialised research equipment in the new building

will be made available to other institutions. The new facility has been designed to match the more exacting standards of current research, and to serve the educational needs of future generations of students much better than is possible at our existing site. Capacity for public events has also been incorporated into the design, so that our extensive programme of outreach work with schools, and with the general public, will continue to serve the local population well into the future. We are looking forward to moving into our new home in 2025.

In 2008 the University made a major investment in the physics of medicine and biology with the construction of a Physics of Medicine research centre in the Department of Physics. The interaction between physics, biology, and medicine are now at a turning point at which multidisciplinary research drawing physics much more deeply into the life sciences is of the highest priority. The Physics of Medicine building, comprising of both shared and dedicated research laboratories can facilitate a wide range of research expertise in physics, soft condensed matter physics, biology, and medicine. The building is located at the West Cambridge Site, and is opposite the new Ray Dolby Centre.

Key information

Currently the Department comprises about 55 academic staff, 200 postdoctoral researchers, and 300 graduate students. Together with administrative and technical support staff and academic visitors, the Department hosts around 1000 people.

Energy Materials at the Cavendish



The efficient and sustainable generation, storage and use of energy is arguably the key challenge facing society in the 21st century and is one in which physics can play a vital role. For most of the devices and systems that we rely on in our daily lives, such as computers, electricity grids, solar cells or batteries, the efficiency with which these devices use, transmit or store energy is still significantly lower than what is theoretically possible based on established physical limits. In all these areas there are exciting opportunities for developing new advanced energy materials and devices that increase efficiency significantly and in this way reduce the cost and improve the sustainability of energy systems. It is clear that we need both incremental improvements of existing technologies, but also new science and new materials to make use of the significant headroom that remains for improving the performance, cost, reliability, and sustainability of our energy technologies.

Research in Energy Materials in the Cavendish (<https://www.phy.cam.ac.uk/research-themes/energymaterials>) covers three broad research directions in energy generation, energy storage and energy use. At the same time this field of physics provides a context for exciting science as it creates opportunities for conceiving and testing new physical principles and paradigms that use energy in novel, more efficient ways. This is a highly interdisciplinary field of physics with close links to chemistry, materials science, engineering and even biology.

The department hosts an active and vibrant research community in the area of energy materials, consisting of 15 academics and more than 200 postdoctoral researchers and PhD students. We also collaborate extensively with other departments in Cambridge in this area and the Cavendish plans a leading role in several interdepartmental initiatives, including the Winton Programme for the Physics of Sustainability (<https://www.winton.phy.cam.ac.uk/>) and Energy@Cambridge (<https://www.energy.cam.ac.uk/>)

The Cavendish Laboratory – Teaching

The course taken by science students in Cambridge is known as the Natural Sciences Tripos. (Tripos is a term with mediaeval origins thought to relate to three-legged stools used by early scholars.) The Tripos curriculum covers all the physical and biological sciences, but is separate from engineering, medicine and mathematics.

In their first year (Part IA), students typically divide their time between three experimental sciences and mathematics, with about 360 students taking physics.

In the second year (Part IB), about 200 students spend two thirds of their time studying physics and one third another subject, usually mathematics.

In the third year (Part II), they concentrate on physics and after successful completion of this year, they can graduate with a Bachelors degree.

Most students (around 150) continue to a fourth year (Part III), where they take a range of masters level courses in physics and related disciplines, undertake an advanced project, and graduate with both a Bachelors and Masters degree.

The structure of the Natural Sciences Tripos ensures that in the early years our students are exposed to a range of disciplines. The very competitive nature of entry to Cambridge means that they are hand-picked for the motivation to learn about science; none are taking our courses simply to score required credits.

The teaching year is short and intense, comprising three terms of eight weeks, and in the first three years most of the assessment of undergraduates is by end of year examination. Further details of the Department's teaching programme can be found here: www.phy.cam.ac.uk/students/teaching



The School of the Physical Sciences

The School of the Physical Sciences is one of the six Schools in the University of Cambridge and comprises the following Departments:

- Applied Mathematics and Theoretical Physics (DAMTP)
- Chemistry
- Earth Sciences
- Geography (including the Scott Polar Research Institute)
- Institute of Astronomy
- Issac Newton Institute of Mathematical Sciences
- Materials Science and Metallurgy
- Physics (Cavendish Laboratory)
- Pure Mathematics and Mathematical Statistics (DPMMS)

About the School

The School is responsible for allocating core funds to departments and provides broad strategic focus across its constituent departments in a number of areas including; research activity, undergraduate and graduate education, estate needs, fundraising and human resources. As part of the University's annual planning cycle, the School prepares a financial and academic plan which sets out strategic objectives, determines budgets as well as the flow of resources to departments. The School manages a wide range of administrative activities and projects across its departments and works alongside other Schools to further interdisciplinary research.

The School has over 1500 members of staff, over 3000 students and an annual budget of over £100 million.



Terms of appointment

Tenure and probation

Appointments are to the retiring age for established academic positions. For University Senior Lecturers and University Lecturers the appointment is subject to satisfactory completion of a five-year probationary period.

Working pattern

This is a full-time post.

Pension

You will automatically be enrolled to become a member of the Universities Superannuation Scheme (USS). If you are already a member of the NHS Pension scheme, you may be eligible to continue in the scheme and should contact the Pensions section of the University: www.pensions.admin.cam.ac.uk/.

Annual leave

Subject to compliance with the Statutes and Ordinances relating to leave, full time officers are entitled in any holiday year to take a minimum of 28 days annual paid holiday. These periods are inclusive of public holidays that fall outside Full Term.

Sabbatical leave

Cambridge is generous in having statutory provision for leave of absence of one term for every six terms of service. Academic staff use this opportunity for study and research.

Residence

It is a requirement of the role that you are resident in the University during term-time. Further information can be found here:

<https://www.admin.cam.ac.uk/univ/so/2019/chapter11-section1.html#indexterm-d358e257>

College membership

Membership of a College adds an important social and many of the University's academic community find attractive.

Appointment to a College fellowship is a separate matter from a University appointment. Most colleges expect their fellows to take part in undergraduate supervision and College administration, for which the College provides modest remuneration additional to University salary.

Many academic staff will be invited to join a College as a teaching fellow, but it is not compulsory for academic staff to be a member of a College. The Head of Department or senior colleagues can offer more advice.

General information

Pre-employment checks

Right to work in the UK - we have

a legal responsibility to ensure that you have the right to work in the UK before you can start working for us.

If you do not have the right to work in the UK already, any offer of employment we make will be conditional upon you gaining it.

Health declaration - once an offer of employment has been made the successful candidate will be required to complete a work health declaration form.

Qualifications - the person specification for this position lists qualifications that are essential and/or desirable. Please note that if you are offered the post you will be asked to provide your relevant original certificates of these qualifications.

References - offers of appointment will be subject to the receipt of satisfactory references.

Equality and Diversity

We particularly encourage women and /or candidates from a Black, Asian and Minority Ethnic background to apply for this vacancy as they are currently under-represented at this level within our University. (Please see relevant guidance before inclusion:

<https://www.hr.admin.cam.ac.uk/recruitment/equality-law-and-recruitment/exceptions-equality-law/positive-action>)

Information if you have a disability

The University welcomes applications from individuals with disabilities.

We are committed to ensuring fair treatment throughout the recruitment process. We will make adjustments to enable applicants to compete to the best of their ability wherever it is reasonable to do so and, if successful, to assist them during their employment. Information for disabled applicants is available at

www.admin.cam.ac.uk/offices/hr/staff/disabled/

We encourage you to declare any disability that you may have, and any reasonable adjustments that you may require, in the section provided for this purpose in the application form. This will enable us to accommodate your needs throughout the process as required.

However, applicants and employees may declare a disability at any time. If you prefer to discuss any special arrangements connected with a disability, please contact, the Department's HR team at hr@phy.cam.ac.uk.

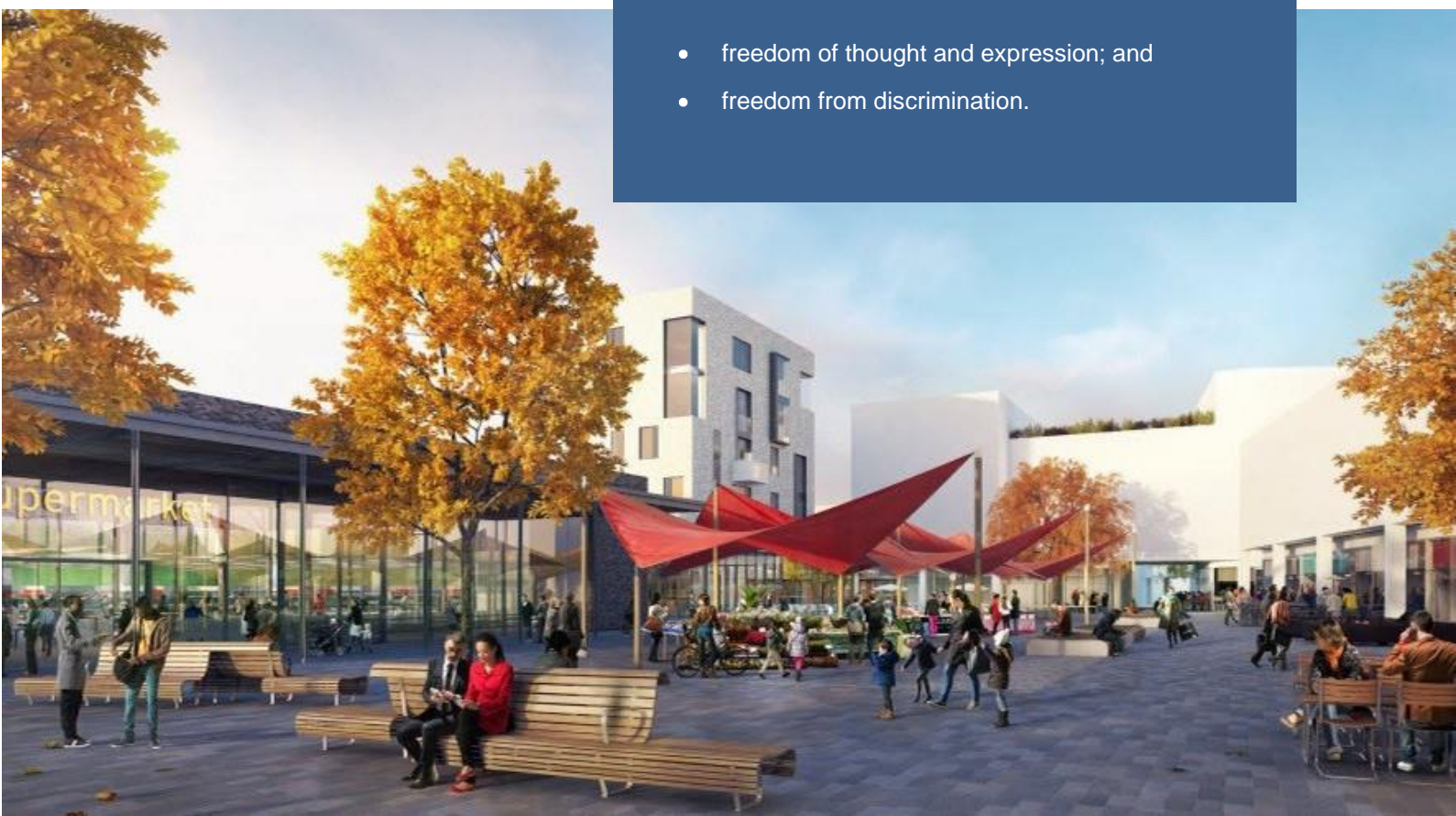
The University

The University of Cambridge is one of the world's oldest and most successful universities. We are a renowned centre for research, education, and scholarship that makes a significant contribution to society. The University is consistently ranked amongst the top universities in the world. Our affiliates have won more Nobel Prizes than any other University.

Our sustained pursuit of academic excellence is built on a long history of first-class teaching and research within a distinctive collegiate system. For eight centuries our ideas and innovations have shaped the world. Our principal goal is to remain one of the world's leading universities in an increasingly competitive global higher education sector. Today the University of Cambridge is at the centre of a cluster of over 4,300 businesses employing 58,000 people. Our capital investment projects include the West Cambridge site, the North West Cambridge development and the growth of the Biomedical Campus in the south of the city. The North West Cambridge development includes the opening of a primary school – the first in the UK to be managed by a University. So we are deeply embedded in, and committed to serving, our local community. These are all conspicuous signs of a University that is not only adapting to new needs, but also anticipating the future.

Our mission is to contribute to society through the pursuit of education, learning, and research at the highest international levels of excellence. Our core values are:

- freedom of thought and expression; and
- freedom from discrimination.





About us

The University is one of the world's leading academic centres. It comprises 150 faculties and departments, together with a central administration and other institutions. Our institutions, museums and collections are a world-class resource for researchers, students and members of the public, representing one of the country's highest concentrations of internationally important collections.

The University has an annual income of £1.66 billion. Research income, won competitively from the UK Research Councils, the European Union (EU), major charities and industry, exceeds £400 million per annum and continues to grow.

The Colleges and the University remain committed to admitting the best students regardless of their background and to investing considerable resources both in widening access and financial support.

The 31 Colleges are self-governing, separate legal entities which appoint their own staff. Many academic staff are invited to join a College as a Teaching Fellow, which provides a further social and intellectual dimension. The Colleges admit students, provide

Our ideas and innovations have shaped the world. Our campaign, 'Dear World... Yours, Cambridge', will raise £2 billion to help us shape all our futures.

student accommodation and deliver small group teaching. The University awards degrees and its faculties and departments provide lectures and seminars for students and determine the syllabi for teaching and conducting research.

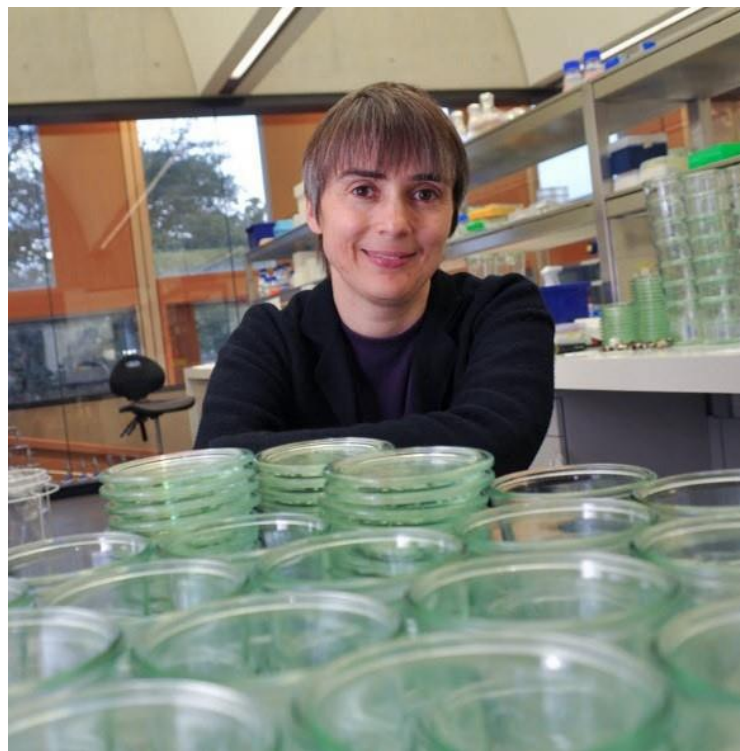
The University's estate is undergoing the most significant transformation in its history. Cambridge has been able to create a new science and technology campus to the west of the city centre, and is now expanding further to the north west of Cambridge including investing in affordable homes for University key workers and community facilities. Even with our continued development, the University remains within walking or cycling distance across the campus. The University is a major partner on the Cambridge Biomedical Campus and we continue to redevelop our historic city centre sites demonstrating our determination to ensure that we can offer the best facilities and opportunities for our staff and students.

Our instinct for seeking out excellence and setting up enduring and mutually beneficial collaborations has led us to establish strategic partnerships across the globe. Whether it is the successful Cambridge-Africa Programme involving universities in Ghana, Uganda and elsewhere on the African continent; or the close association with the government of India to pursue new research in crop science; or the creation, with Germany's Max Planck Institutes, of a Cambridge-based centre for the study of ethics, human economy and social change – international partnerships are now an inextricable part of the University's make-up.

Working at the University

Working at Cambridge you will join a diverse, talented and innovative community, with more than 18,000 students and over 11,000 staff from all walks of life and corners of the world.

The University continually explores strategies to attract and retain the best people. It is committed to supporting its staff to achieve their best. We are a fair, diverse and inclusive society and we believe our staff are our greatest asset. There is strong commitment to developing institutional leadership and supporting and encouraging staff development at all levels. Furthermore, the University's Athena SWAN award recognises and celebrates good practice in recruiting, retaining and promoting women. We offer a variety of roles including academic, research, professional, managerial and support roles. We also offer extensive benefits and excellent learning opportunities within a stimulating working environment. The University has signed up to the Race Equality Charter, a notional framework for improving the representation, progression and success of minority ethnic staff and students within higher education.



Living in Cambridge



Cambridge is rich in cultural diversity. From beautiful University and College buildings, museums and art galleries, quaint gardens and punts on the River Cam, to a vibrant restaurant and café scene, our employees are surrounded by the wonderful features of this unique city.

If you prefer the faster pace of life, London is a 45 minute train journey away. For those travelling from overseas, Stansted Airport is just 45 minutes away and Heathrow Airport under 2 hours away.



The University is a short distance from a host of other attractions such as Ely Cathedral, Newmarket Races and various wildlife parks and stately homes.

Cambridge is also within easy reach of the beautiful Broads and coastlines of Norfolk and Suffolk.

Further information about attractions in and around Cambridge can be found at [Visit Cambridge](http://www.visitcambridge.org), the official tourism website for the city.

What Cambridge can offer

We offer a comprehensive reward package to attract, motivate and retain high performing staff at all levels and in all areas of work. The University offers a wide range of competitive benefits, from family leave entitlement, to shopping and travel discount schemes. Our generous annual leave package contributes to the positive wellbeing of our University employees. Sabbatical leave enables academics to focus on research and scholarship, whilst still maintaining their full salary. The University also has a career break scheme for academic and academic-related staff, with additional flexible working policies for all other staff.

CAMBens employee benefits

We offer a CAMBens scheme for University employees, providing access to online and in-store shopping discounts and cashback. With more than 2,000 participating retailers, employees can save money on a wide range of household expenses, from groceries and clothes, to holidays and insurance and much more. A range of local discounts are also available, helping employees to save money whilst also supporting local Cambridge businesses. CAMBens Cars and CAMBens Cycle to Work salary sacrifice schemes are also available, which enable employees to save money on transport costs. A 10% discount rate on the purchase of train season tickets, bulk buy tickets and an interest free travel to work loan are also available for staff of the University of Cambridge.

Family-friendly policies

The University recognises the importance of supporting its staff. We have a range of family-friendly policies to aid employees' work-life balance including a generous maternity, adoption and shared parental leave

entitlement of 18 weeks full pay and emergency family care support via My Family Care. In addition, our highly regarded workplace nurseries, childcare vouchers, a childcare salary sacrifice scheme and a high quality holiday play scheme are available to help support University employees with caring responsibilities. The Newcomers and Visiting Scholars Group is an organisation within the University run by volunteers whose aim is to help newly arrived wives, husbands, partners and families of Visiting Scholars and members of the University to settle in Cambridge and give them an opportunity to meet local people. The Office of Postdoctoral Affairs supports the postdoctoral community within Cambridge. Further details are available here: <https://www.opda.cam.ac.uk/>

Your wellbeing

The University's Sport Centre, Counselling Services and Occupational Health are just some of the support services available to University employees to promote their physical and mental wellbeing. There are many societies in Cambridge catering for almost every taste and interest. Whether you want to take part in a sport, participate in music or drama, pursue a hobby, or join a political group, you will almost certainly find that a society exists for this purpose. The University also hosts the Cambridge Science Festival and Cambridge Festival of Ideas, as well as Open Cambridge weekend, which together attract over 50,000 visitors per year. The festivals are a great opportunity to get your first taste of public engagement, through volunteering, supporting hands-on activities or proposing a talk.



What Cambridge can offer

Pay and benefits

The University salary structure includes automatic service-related pay progression in many of its grades and an annual cost of living increase. In addition to this, employees are rewarded for outstanding contribution through a number of regular pay progression schemes. The University offers attractive pensions schemes for employees, with an additional benefit of a salary exchange arrangement providing tax and national insurance savings. Payroll giving is also a simple, tax-efficient way for employees to make monthly donations to charity.

Relocating to Cambridge

The University Accommodation Service exists to help employees in their search for a rental home in Cambridge. A new University development at North West Cambridge called Eddington offers subsidised rented accommodation to University staff. The development consists of high quality furnished one and two bedroom apartments. For more information about the development and how to apply please visit the website www.nwc.cambridge.co.uk



The importance of helping individuals settle into a new area is also recognised by the University. The Shared Equity Scheme <https://www.hr.admin.cam.ac.uk/pay-benefits/cambens-employee-benefits/financial/shared-equity-scheme> provides financial assistance to qualifying new members of staff with the purchase of living accommodation, where they have to relocate to take up their appointment. Removal expenses are also available for qualifying new members of staff.



Equality & diversity

The University has a vibrant and varied community. We support and encourage under-represented groups and we value diversity. We welcome applications from individuals with disabilities. Our recruitment and selection procedures follow best practice. We have an Equal Opportunities Policy, along with a range of diversity networks for women, black and minority ethnic and lesbian, gay, bisexual and transgender staff. More details are available here: <http://www.equality.admin.cam.ac.uk/>

Development opportunities

We support new employees to settle in through various activities. The encouragement of career development for all staff is one of the University's values and we put this into practice through various services and initiatives. Our Personal and Professional Development Department provides development opportunities and courses for all University employees. These include face-to-face sessions, online learning modules and webinars. Employees may also apply for financial support to undertake training that will lead to a qualification. We offer reduced staff fees for University of Cambridge graduate courses and the opportunity to attend lectures and seminars held by University departments and institutions. The CareerStart@Cam programme also supports employees in assistant staff roles who do not hold higher education qualifications to develop their skills, experience and qualifications.

Whether it is understanding the molecular basis of neurodegenerative diseases, or helping farmers in India increase their yield, or discovering better ways to live in large cities – I know that what we do in Cambridge affects lives, and livelihoods, the world over.

Vice Chancellor Emeritus, Professor Sir Leszek Borysiewicz, 2016

How to apply

Applications should be submitted online via the University of Cambridge jobs page www.jobs.cam.ac.uk by clicking “Apply online” in the job advert. You will need an email address to register for our online system.

Conversations about flexible working are encouraged at the University of Cambridge. Please feel free to discuss flexibility prior to applying, using the contact information below, or at interview if your application is successful.

Informal enquiries are welcomed and should be directed to:

Professor Akshay Rao (ar525@cam.ac.uk).

If you have any queries regarding the application process, please contact Samantha Stokes, Departmental Administrator (departmental.administrator@phy.cam.ac.uk)

The closing date for applications is 15th October 2024.



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CAMBRIDGE