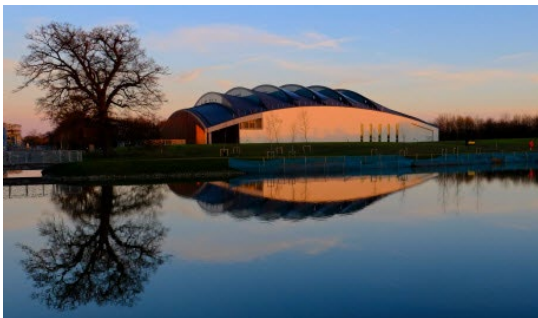


# Research Assistant in Compression for Communication-Efficient Training

Department of Computer Science and Technology

Closing date: 31 July 2025  
Job Reference: NR46699



## Research Assistant (RA) in Compression in Communication Efficient Training

**Salary:**

Research Assistant: £32,546  
– £35,116

**Contract:**

Fixed term (3 years)

**Location:**

West Cambridge

**Faculty / Department:**

Computer Science and  
Technology

**Working Pattern:**

Full Time

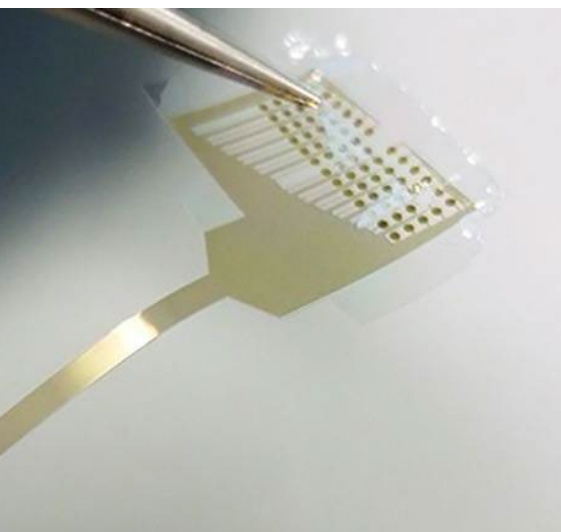
**Responsible to:**

Professor Nicholas D. Lane

**The role**

We are seeking a highly motivated and talented researcher to join our team working on decentralised training methods for large-scale foundation models. This position will focus on developing novel approaches to overcome the computational and data access barriers that currently limit the accessibility of foundation model training.

The Cambridge Machine Learning Systems Lab (CaMLSys) at the University of Cambridge investigates foundational challenges at the intersection of machine learning and computational systems. Our research spans two main areas: (1) developing theoretically grounded machine learning methods with strong real-world applicability, emphasizing both performance and safety — as seen in our work on federated learning and AI safety; and (2) designing algorithms, system software, and hardware that treat machine learning as a first-class workload, enabling major advances in efficiency, scalability, and deployment. One example is Photon, our system for decentralized training of large language models



**Main Responsibilities**

## 1. Research and scholarship:

- Conduct research on federated learning, distributed optimisation, and model compression techniques.
- Develop and implement low-rank update mechanisms in large-scale federated training setups.
- Evaluate the impact of proposed methods on communication efficiency, memory requirements, and model performance.
- Collaborate with internal and external research partners.
- Disseminate findings through peer-reviewed publications and presentations at top-tier conferences.
- Contribute to open-source software development where appropriate.

## 2 Teaching and learning support:

- assist in the supervision of student projects;
- may assist in the development of student research skills;
- provide limited supervision/instruction to classes;
- may plan and deliver seminars relating to research area

## 3 Liaison and networking:

- liaise with colleagues and students;
- build internal and external contacts and participate in networks for the exchange of information and to form relationships for future collaboration.

## 4 Planning and organising:

- plan the use of research resources, laboratories and workshops as appropriate;
- plan and manage own research and development activity in collaboration with others;
- contribute to planning of joint research projects led by principal investigator.

# Person Specification

Criteria	Essential	Desirable
<b>Education &amp; qualifications</b>		
Holds BA/Masters (or near completing) in Computer Science or related subject, or equivalent experience	✓	
<b>Specialist knowledge &amp; skills</b>		
Ability to pursue scientific investigation from the conception stage through to publication.	✓	
Will continually update knowledge in the specialist area and engage in continuous professional development.	✓	
Experience with large-scale model training and modern ML frameworks (e.g., PyTorch, TensorFlow).	✓	
Strong background in deep learning and distributed systems	✓	
<b>Interpersonal &amp; Communication skills</b>		
Proven Communication skills and the ability to present their research at the appropriate national and international forums and technical and non- technical audiences.	✓	
Proven Organisational skills, with the ability to manage their own workload and work to deadlines.	✓	
<b>Relevant Experience</b>		
The role holder would possess some research experience with sufficient breadth/depth of specialist knowledge in the relevant disciplines and of research methods and techniques to work within established research programmes.	✓	
<b>Additional Requirements</b>		
To demonstrate ability to write reports, present results and contribute to academic papers.	✓	
A high level of accuracy and attention to detail.		✓
Strong motivation to work in interdisciplinary environments		✓

# Computer Science and Technology



**The Department of Computer Science and Technology is an academic department that encompasses computer science along with many aspects of engineering, technology and mathematics. We have a world-wide reputation for academic research with consistent top research ratings. Professor Alistair Beresford is the Head of Department.**

The Department has around 340 people engaged in research: academic staff, research associates, and PhD students. Research is carried out across a broad range of subjects within Computer Science. A September 2018 report describing the Department's research and the wider environment in which it operates, which was originally prepared for the University's Strategic Research Review of the Department, is available [here](#).

The Department has an open and collaborative culture, supporting revolutionary fundamental computer

science research, strong cross-cutting collaborations internally and externally, and ideas which transform computing outside the University. Please follow the links to the Themes at:

<https://www.cst.cam.ac.uk/research> to find out more about our research.

Support staff play a key role in supporting the Department's academic and research endeavours. The Department provides a stimulating environment that promotes a strong sense of community, whilst valuing and recognising individual contributions.



# The School of Technology

**The School of Technology is one of six academic divisions at the University of Cambridge. The School brings together departments and institutes working at the forefront of technological and societal progress, including the Department of Engineering, Department of Chemical Engineering and Biotechnology, Cambridge Institute for Sustainability Leadership, Cambridge Judge Business School, and the Department of Computer Science and Technology.**

Dedicated to benefitting society through advancing the frontiers of technology and the economies and enterprises into which it is deployed, we deliver outstanding education, conduct world-class research, and foster discovery and innovation. We support students, staff, industry, and society by nurturing talent, promoting individual enterprise, and building partnerships that benefit society.

We strive to continue to be a global leader in education, research, and innovation, inspiring a diverse community of staff, students, alumni, and external partners that drives technological progress and societal impact. Building on the fundamental underpinning technologies that we work on, we envision a future where our commitment to excellence and collaboration empowers individuals and industries to meet complex challenges and shape a better world.

Our four strategic research themes – **Sustainable Future, Health and Wellbeing, Increased Competitiveness, and Security and Resilience** – guide interdisciplinary collaboration and reflect our ambition to address some of the most pressing global challenges through technological innovation. We are proud to foster a welcoming, inclusive, and supportive environment where people from all backgrounds can thrive.



We value diversity and promote equal opportunities, recognising that a wide range of experiences and perspectives strengthens our community and our work. International staff are a vital part of our success, and we aim to support all new colleagues in their transition to life and work in Cambridge. Our staff benefit from access to outstanding resources, a vibrant global academic community, and a wide range of personal and professional development opportunities.

The School plays a key strategic role in supporting its departments, allocating resources, shaping academic and financial planning, and advancing initiatives in research, infrastructure, education, and engagement. The School Office, led by the Head and Secretary of the School, supports governance, coordination, and services across departments.

For more information about the School and its departments, please visit:  
<https://www.tech.cam.ac.uk/>

# Terms of Appointment

## Tenure and probation

The appointment will be made on a fixed term basis for 3 years.

Appointments will be subject to satisfactory completion of a six-month probationary period.

## Hours of Work and Working Pattern

The appointment is initially offered full time, working Monday – Friday. However, we would be open to discussing part time or flexible working arrangements.

## Pension

You will automatically be enrolled to become a member of USS (Universities Superannuation Scheme) – a defined benefit and defined contribution pension scheme. For further information please visit:

[www.pensions.admin.cam.ac.uk/](http://www.pensions.admin.cam.ac.uk/).

## Annual leave

Full time employees are entitled to annual paid leave of 6.6 weeks (or 33 days for those working full time), plus public holidays.

## 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 to you 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.

## 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 <http://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 Programme's Executive Director, who is responsible for recruitment to this position.

# The University

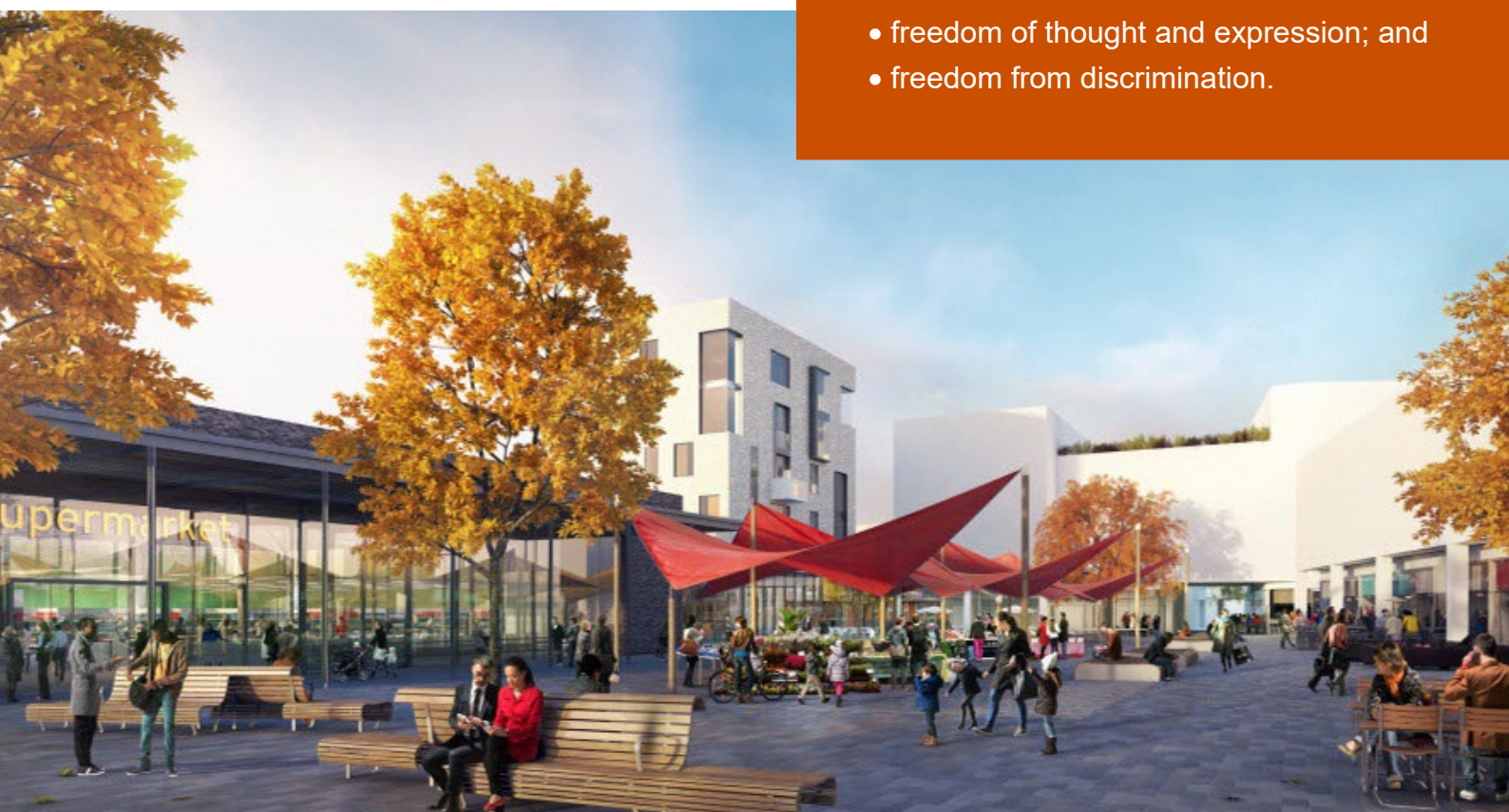
**The University of Cambridge is one of the world's oldest and most successful universities. We are a renowned centre for research, education, and scholarship that makes a significant contribution to society. The University is consistently ranked amongst the top universities in the world. Our affiliates 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 £2 billion. Research income, won competitively from the UK Research Councils, the European Union (EU), major charities and industry, exceeds £500 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 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.

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.

“Cambridge graduates and researchers have made – and continue to make – a colossal contribution to human knowledge and the understanding of the world around us. Their work touches on the lives and livelihoods of everyone from patients diagnosed with life-threatening diseases, to residents of areas critically affected by climate change, to children growing up in conflict zones. It has a lasting impact on our society, our economy and our culture: the world is truly a better place thanks to their efforts.”

*Stephen Toope, Vice Chancellor 2019*



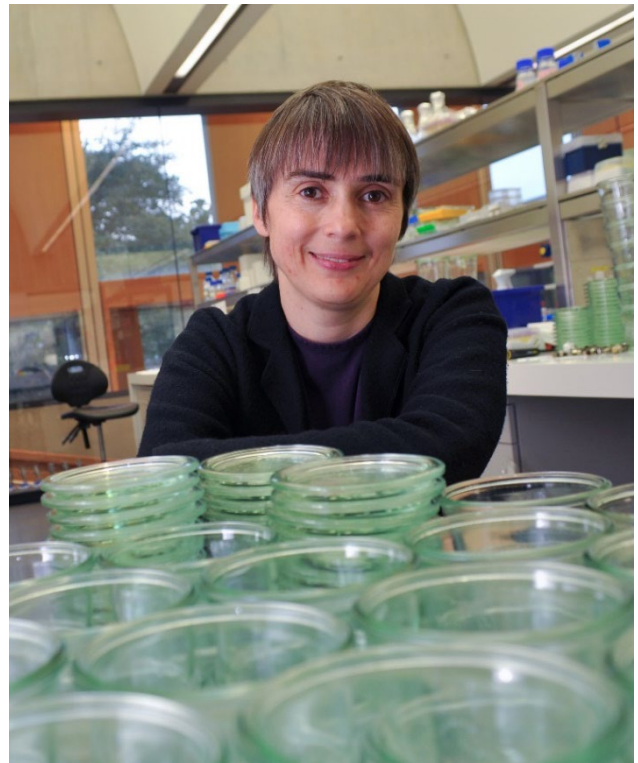
# Working at the University

**Working at Cambridge you will join a diverse, talented and innovative community, with more than 18,000 students and over 16,000 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.

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'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.



## Equality & diversity

The University has built its excellence on the diversity of its staff and student community. We aim to be a leader in fostering equality and inclusion, and in promoting respect and a sense of belonging for all. We encourage applications from all sections of society. All appointments are made on the basis of merit. 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/>

The University has a bronze Race Equality Charter aware, with framework for improving the representation, progression and success of minority ethnic staff and students within higher education. Furthermore, the University's Athena SWAN award recognises and celebrates good practice in recruiting, retaining and promoting women.



# 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.**

You can find a wide-range of high street shops and 3 shopping centres, with independent alternatives at the historic market and nestled within the passageways in the city centre. You will find a cinema, bowling alley, a nightclub and various live performances At the Cambridge Leisure Park, with further entertainment options at the Corn Exchange, Arts Theatre and the ADC Theatre. Further information can be found on the Visit Cambridge website.

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.

## Relocation Support

The University recognises the importance of helping individuals to move and settle into a new area. We provide support and guidance to those relocating internationally or domestically to take up a post at the University of Cambridge, liaising with other University offices and selected partners to ensure comprehensive relocation support is available. This includes: accommodation, childcare, schools, banking, immigration and transport. If you would like further information, please visit <https://www.accommodation.cam.ac.uk/>. The Shared Equity Scheme and the Reimbursement of Relocation Expenses Scheme provide financial assistance to qualifying new members of staff with the costs of relocating to Cambridge.

## Accommodation Service

The University Accommodation Service helps staff, students and visiting scholars who are affiliated to the University in their search for suitable accommodation in Cambridge. The dedicated accommodation team can provide access to a wide range of University-owned furnished and unfurnished properties, and has a database of private sector accommodation available for short and long-term lets. For further information and to register with this free service please visit <https://www.accommodation.cam.ac.uk/>



# 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.



## 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.

## 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 and a CAMbens Cycle to Work salary sacrifice scheme is also available, which enables 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.





# What Cambridge can offer

## 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.

Other family-friendly support includes:

Our highly regarded workplace nurseries, a childcare salary exchange scheme and a high quality holiday Playscheme may be available to help support University employees with caring responsibilities (subject to demand and qualifying criteria). Further childcare information can be found here:

<https://www.childcare.admin.cam.ac.uk/>

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.

## 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.





# How to apply

Applications should be submitted online via the University of Cambridge jobs page [www.jobs.cam.ac.uk](http://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.

If you have any queries regarding the application process please contact **HR Team** at [personnel-admin@cst.cam.ac.uk](mailto:personnel-admin@cst.cam.ac.uk).

The closing date for applications is: 31 July 2025