



UNIVERSITY OF LEEDS

CANDIDATE BRIEF

**Research Fellow in Modelling of Fixational Eye Movements,
Faculty of Engineering and Physical Sciences**



Salary: Grade 7 (£37,099 – £44,263 p.a.) Due to funding restrictions, an appointment will not be made higher than £39,347 p.a.

Reference: EPSMA1094

Closing date: Sunday 19 November 2023

Fixed-term for 2 years, to end by 31 March 2026, starting no later than 01 April 2024

We are open to discussing flexible working arrangements

Research Fellow in Modelling of Fixational Eye Movements, School of Mathematics.

Are you an ambitious researcher looking for your next challenge? Would you like to apply your expertise in theoretical physics or mathematics to a biological problem? Would you like to work with exciting multidisciplinary teams including vision scientists, experimental psychologists, instrumentation engineers, and computational modellers to understand how we process visual information?

We are seeking to appoint a Research Fellow in biological applications of theoretical physics and mathematics, funded under the UKRI 'Building Collaboration in the Physics of Life' scheme. The project, "A fresh look at visual sampling: (PhysFEM) How are fixational eye-movements optimised?" is in collaboration with Oxford University Department of Experimental Psychology and US collaborators. The project brings theoretical and numerical modelling (Leeds) together with advanced adaptive-optics retinal imaging, positional measurement and stimulation, and computation (Oxford) to explore the hypothesis that fixational eye-movements (FEMs) are optimised to tasks.

You will work with [Prof. Daniel Read](#) to develop analytical and numerical models of the trajectories of fixational eye movements (FEMs), exploring their influence on biological visual processing, and investigating the characteristics of FEM paths that are most optimal and useful to the observer under a range of assumptions and constraints. Working closely with the experimental team of [Prof. Hannah Smithson](#) at the University of Oxford, who measure fine-scale eye movements with an advanced Adaptive Optics Scanning Laser Ophthalmoscope (AO-SLO), you will be part of a core collaborative team, evaluating predictions from models against experiments. You will also work closely with a computational Research Fellow at Oxford and with [Prof. David Brainard](#)'s group at the University of Pennsylvania to transfer your new modelling capacity into the public domain via the [ISETBio](#) human vision modelling tool.

You will have a PhD in Physics, Mathematics, or a closely allied discipline, with a strong background in theoretical (analytical and/or numerical) modelling of physical or biological systems, and with expertise in at least one of statistical physics, information theory or Bayesian statistics. Ideally you would also have knowledge of one or more of: relevant biology, mathematical biology, biological physics, soft matter physics, vision science or image processing.



You will have the ability to conduct independent research and a developing track record of publications in international journals. In addition, you will have excellent communication, planning and team working skills with an ability to work in an interdisciplinary project.

What does the role entail?

As a Research Fellow, your main duties will include:

- Developing analytical and numerical models of the trajectories of fixational eye movements (FEM) together with mathematical models of biological vision, and analysing these to make predictions for optimised fixational eye movements under a range of assumptions and constraints;
- Collaborating closely with other PhysFEM Research Fellows and supervisors in Leeds and Oxford, and communicating with international research collaborators (e.g. Prof Brainard, U. Penn);
- Participating actively in regular project meetings, both online and in person;
- Generating and pursuing independent and original research ideas in the area of the PhysFEM UK Physics of Life project;
- Developing research objectives and proposals and contributing to setting the direction of the research project and team including preparing proposals for funding in collaboration with colleagues;
- Making a significant contribution to the dissemination of research results by publication in leading peer-reviewed journals and by presentation at national and international meetings;
- Working independently and as part of a larger team of researchers, both internally and externally, to develop new research links and collaborations and engage in knowledge transfer activities where appropriate;
- Evaluating methods and techniques used and results obtained by other researchers and to relate such evaluations appropriately to your own research;
- Maintaining your own continuing professional development and acting as a mentor to less experienced colleagues as appropriate;
- Contributing to the training of both undergraduate and postgraduate students, including assisting with the supervision of projects in areas relevant to the project.



These duties provide a framework for the role and should not be regarded as a definitive list. Other reasonable duties may be required consistent with the grade of the post.

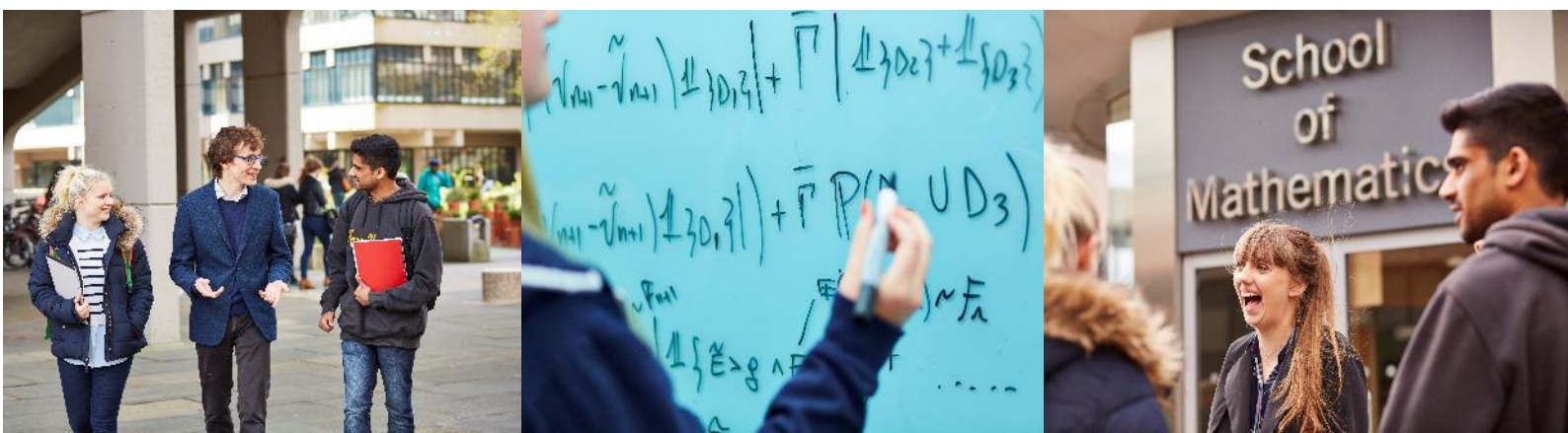
What will you bring to the role?

As a Research Fellow, you will have:

- A PhD (or have submitted your thesis before taking up the role) in Physics, Mathematics or a closely allied discipline;
- A strong background in a range of theoretical and computational research techniques and methodologies applicable to modelling of physical or biological systems;
- Expertise in at least one of statistical physics, information theory or Bayesian statistics;
- The ability to approach an unfamiliar problem or topic mathematically: acquiring the necessary knowledge, discerning appropriate approximations, and formulating and solving the relevant systems of equations;
- The ability to work and communicate effectively with biological, computational and experimental scientists;
- Commitment to promoting and supporting diversity, equality and inclusion within the school;
- Good time management and planning skills, with the ability to meet tight deadlines and manage competing demands effectively without close support;
- A developing track record of peer-reviewed publications in international journals;
- Excellent communication skills both written and verbal, and the ability to communicate your research at national and international conferences;
- A proven ability to work well both individually and in a team;
- A strong commitment to your own continuous professional development.

You may also have:

- Experience of pursuing external funding to support research;
- Knowledge of, or expertise in, one or more of: relevant biology, mathematical biology, biological physics, soft matter physics, vision science or image processing;
- Experience of collaboration across physical and life sciences, and experience of multi-site working.



How to apply

You can apply for this role online; more guidance can be found on our [How to Apply](#) information page. Applications should be submitted by **23.59** (UK time) on the [advertised closing date](#).

Contact information

To explore the post further or for any queries you may have, please contact:

[Professor Daniel Read](#), Professor of Soft Matter

Tel: +44 (0)113 343 5124

Email: D.J.Read@leeds.ac.uk

Additional information

Faculty and School Information

Further information is available on the research and teaching activities of the [Faculty of Engineering & Physical Sciences](#), and the [School of Mathematics](#).

A diverse workforce

As an international research-intensive university, we welcome students and staff from all walks of life and from across the world. We foster an inclusive environment where all can flourish and prosper, and we are proud of our strong commitment to student education. Within the Faculty of Engineering and Physical Sciences we are dedicated to diversifying our community and we welcome the unique contributions that individuals can bring, and particularly encourage applications from, but not limited to Black, Asian and ethnically diverse people; people who identify as LGBT+; and people with disabilities. Candidates will always be selected based on merit and ability.

The Faculty of Engineering and Physical Sciences are proud to have been awarded the Athena SWAN [Silver](#) Award from the Equality Challenge Unit, the national body that promotes equality in the higher education sector. Our [equality and inclusion webpage](#) provides more information.



Working at Leeds

We are a campus-based community and regular interaction with campus is an expectation of all roles in line with academic and service needs and the requirements of the role. We are also open to discussing flexible working arrangements. To find out more about the benefits of working at the University and what it is like to live and work in the Leeds area visit our [Working at Leeds](#) information page.

Information for disabled candidates

Information for disabled candidates, impairments or health conditions, including requesting alternative formats, can be found on our [Accessibility](#) information page or by getting in touch with us at hr@leeds.ac.uk

Criminal record information

Rehabilitation of Offenders Act 1974

A criminal record check is not required for this position. However, all applicants will be required to declare if they have any 'unspent' criminal offences, including those pending.

Any offer of appointment will be in accordance with our Criminal Records policy. You can find out more about required checks and declarations in our [Criminal Records](#) information page.

