



UNIVERSITY OF LEEDS

CANDIDATE BRIEF

Research Fellow in Mathematical modelling of the Bunyaviruses intra-cellular life cycle, Faculty of Engineering & Physical Sciences



Salary: Grade 7 (£33,797 – £40,322 p.a.) Due to funding restrictions an appointment will not be made above £36,914 p.a.

Reference: EPSMA1049

Closing date: Tuesday 30 November 2021

Fixed-term for 36 months

We will consider job share and flexible working arrangements

Research Fellow in Mathematical modelling of the Bunyaviruses intra-cellular life cycle, School of Mathematics

Are you an enthusiastic and motivated researcher with an interest in developing models to understand viral infection dynamics? Would you like to use your mathematical, statistical and computational skills to understand the intracellular life cycle of Bunyaviruses? Are you interested in the opportunity to gain experience working in a cross-disciplinary team in collaboration with international partners?

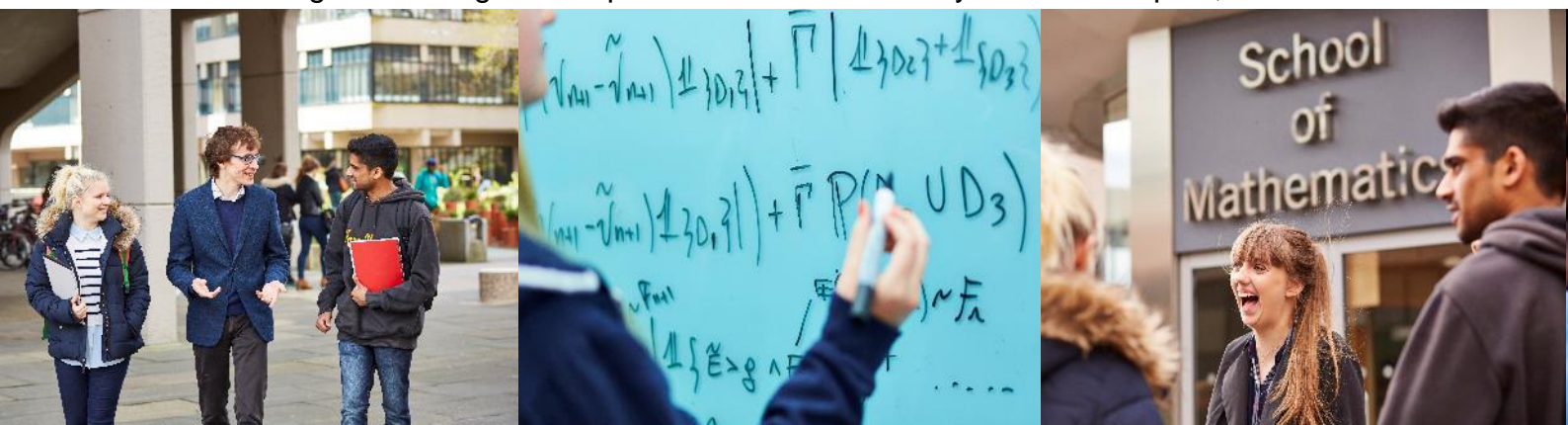
You will contribute to the development of mathematical models of the intracellular life cycle of Bunyaviruses with reassortment. You will work in an inter-disciplinary environment in the Mathematical Immunology group at the School of Mathematics in Leeds. You will work together with a second Research Fellow in the Faculty of Biological Sciences who will experimentally quantify intracellular viral dynamics. You will use stochastic and deterministic approaches, and develop computational tools to parametrise mathematical models of a single viral infection and co-infection, with the datasets generated by the experimental Fellow, who will work under the supervision of Dr John Barr in the Faculty of Biological Sciences.

You will hold a PhD (or be close to completion) in Mathematics, Statistics or Physics, with expertise and experience of developing and applying mathematical models, statistical inference of the models with experimental data and computational simulations.

What does the role entail?

As a Research Fellow, your main duties will include:

- Working in collaboration with the project teams to develop mathematical models of viral dynamics;
- Using single-step infection and co-infection experimental data to calibrate parameters in these mathematical models;
- Developing computational tools based on the mathematical models, to generate predictions and carry out simulations;
- Carrying out sensitivity analysis on these models, and developing efficient algorithms to generate predictions and effectively visualize outputs;



- Carrying out identifiability analysis of the models and validate models with data;
- Engaging with collaborators at Public Health England, Turkey, Tajikistan and Los Alamos National Laboratory, who are part of the project;
- Developing relevant documentation (such as annual reports to funding agencies) around the mathematical models and computational tools to be developed within the project, to be shared within the team and with our partners;
- Preparing papers using LaTeX for publication in leading international journals and disseminating research results by attending relevant workshops and conferences;
- Working both independently and also as part of a large and international team of researchers, engaging in knowledge-transfer activities where appropriate and feasible;
- 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;
- 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;
- Evaluating methods and techniques used and results obtained by other researchers and to relate such evaluations appropriately to your own work;
- Travel to visit international partners as required by the project objectives.

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 close to completion) in Mathematics, Statistics or Physics;
- Strong quantitative skills including experience with stochastic modelling, Markov processes and computational simulations;
- Significant programming experience using Python and/or C applied to developing complex computational simulations;



- Significant experience of parametrising models with data through Bayesian statistical approaches, to incorporate uncertainty;
- Experience with using high performance computing facilities to run computationally demanding codes;
- Some experience of working with clinical or experimental partners;
- A track record of peer-reviewed publications in high-quality international journals;
- Experience with working as part of a large international and interdisciplinary team;
- Ability to work independently and take the initiative, and also engage effectively with others in a team;
- Excellent written and verbal communication skills including presentation skills;
- A strong commitment to your own continuous professional development.

You may also have:

- Experience with modelling cellular, viral or within-host systems;
- Experience with developing within-host infection models;
- Experience with developing deterministic models through differential equations;
- Knowledge of efficient stochastic simulation techniques, such as the tau-leaping methodology;
- Experience of pursuing external funding to support research.

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

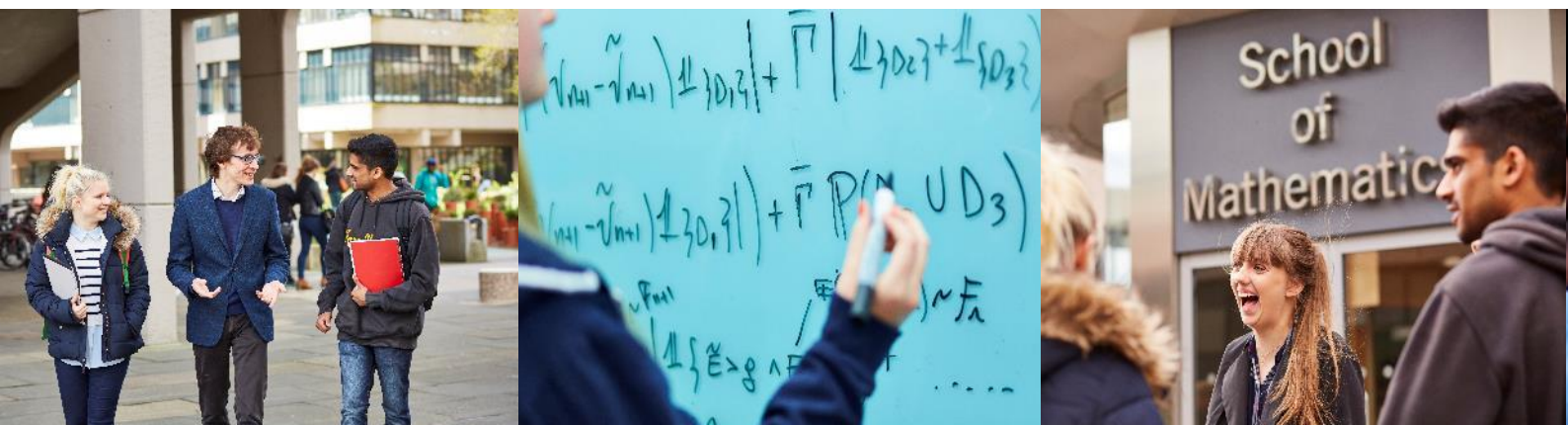
To explore the post further or for any queries you may have, please contact:

[Dr Martin Lopez Garcia](#), Lecturer, School of Mathematics

Email: M.LopezGarcia@leeds.ac.uk

[Prof Grant Lythe](#), Professor, School of Mathematics

Email: grant@maths.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

The Schools in the Faculty of Engineering & Physical Sciences are proud to have been awarded the Athena SWAN [Bronze or 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

Find out more about the benefits of working at the University and what it is like to live and work in the Leeds area on our [Working at Leeds](#) information page.

Candidates with disabilities

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

Please note: If you are not a British or Irish citizen, from 1 January 2021 you will require permission to work in the UK. This will normally be in the form of a visa but, if you are an EEA/Swiss citizen and resident in the UK before 31 December 2020, this may be your passport or status under the EU Settlement Scheme.

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.

