



UNIVERSITY OF LEEDS

CANDIDATE BRIEF

Research Fellow in Geometric Topology, Topological Quantum Field Theory and Applications to Quantum Computing, Faculty of Engineering & Physical Sciences



Salary: Grade 7 (£33,797 – £40,322 p.a.)

Reference: EPSMA1017

Closing date: Wednesday 10 June 2020

Fixed-term for 6 months

We will consider job share / flexible working arrangements

Research Fellow in Geometric Topology, Topological Quantum Field Theory and Applications to Quantum Computing, School of Mathematics.

Are you an ambitious researcher looking for your next challenge? Do you have an established background in at least one of the following areas: geometric topology, topological quantum field theory, lattice and string-net models for topological phases, or higher gauge theory? Do you want to further your career in one of the UK's leading research intensive universities?

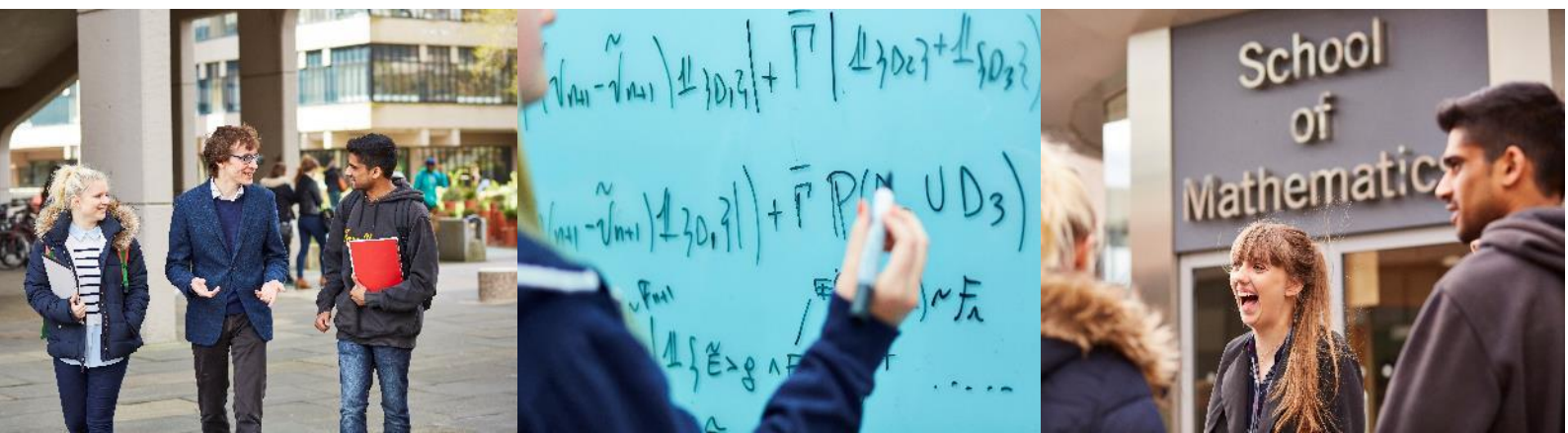
We are looking for a post-doctoral Research Fellow to work on the Leverhulme Trust funded research project, "Emergent physics from lattice models of higher gauge theory". You will contribute to our project aim, which is to investigate the different types of point-like and loop/string-like topologically excited states arising in higher gauge theory lattice models for (3+1)-dimensional topological phases of matter. A central topic of this project concerns analysing the behaviour of higher gauge theory loop excitations when they move in three-dimensional space, braid and interact, and explore applications to topological quantum computing and to knot theory in four dimensions.

You will have a PhD in algebra, low dimensional topology, topological quantum field theory, mathematical models of topological phases of matter, topological quantum computing, or a closely allied discipline, alongside experience in geometric topology or topological quantum field theory. You will also have the ability to design, execute and write up research independently, and a developing track record of peer reviewed publications in international journals.

What does the role entail?

As a Research Fellow, your main duties will include:

- Designing, planning and conducting a programme of investigation, in areas relevant to the project aims, in consultation with Dr João Faria Martins (Principal Investigator) and Professor Paul Purdon Martin (Co-Investigator);



- Generating and pursuing independent and original research ideas in geometric topology, topological quantum field theory, higher gauge theory, lattice and string-net models for topological phases, and topological quantum computing;
- 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;
- Preparing papers for publication in leading international journals and disseminating research results through other recognised forms of output;
- Working both independently and also as part of a larger 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 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 close to completion) in algebra, geometric topology, topological quantum field theory, mathematical models of topological phases of matter, topological quantum computing, or a closely allied discipline;
- A strong background in topological quantum field theory or geometric topology;
- Good time management and planning skills, with the ability to meet tight deadlines, manage competing demands and work effectively under pressure without close support;
- A proven track record of peer-reviewed publications in high impact factor journals;
- Excellent written and verbal communication skills including presentation skills;
- 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;
- Experience in lattice and string-net models for topological phases of matter, or topological quantum computing;
- Experience in extended topological quantum field theories, algebraic topology, higher gauge theory, or representation theory;
- Background knowledge in topological phases of condensed matter physics;
- Experience in programming.

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 João Faria Martins](#), Lecturer in Algebra

Tel: +44 (0)113 343 4433

Email: J.FariaMartins@leeds.ac.uk

OR

[Professor Paul Purdon Martin](#), School of Mathematics

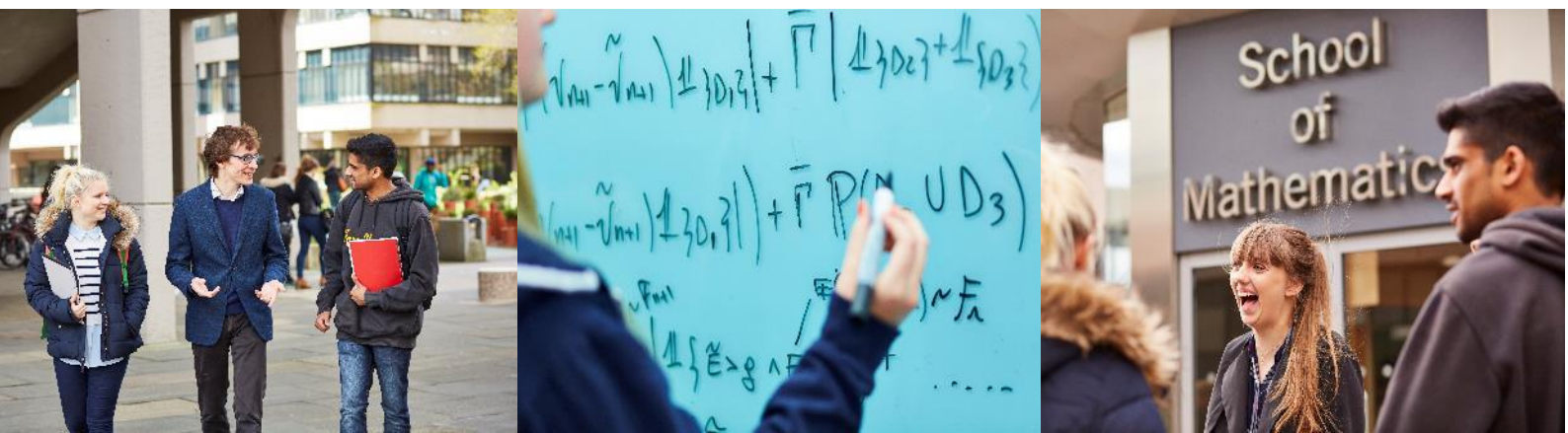
Tel: +44 (0)113 343 7787

Email: P.P.Martin@leeds.ac.uk

Additional information

Faculty and School Information

Find out more about the [Faculty of Engineering and Physical Sciences](#), [School of Mathematics](#) plus our [Research](#) and associated facilities.



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.

Criminal record information

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. Rehabilitation of Offenders Act 1974

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.

