UNIVERSITY OF LEEDS

CANDIDATE BRIEF

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

Salary: Grade 7 (£32,548 – £38,833 p.a.)

Reference: MAPMA1083

Closing date: 29 May 2018

Fixed-term for two years

Due to funding limitation it is unlikely that the starting salary will exceed £34,520 a year

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, Faculty of Mathematics and Physical Sciences

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 our 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 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 either 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 consultation with Dr João Faria Martins (Principal Investigator) and Professor Paul Purdon Martin (Co-Investigator);
- Generating independent and original research ideas and methods in geometric topology, topological quantum field theory, higher gauge theory, lattice and



string-net models for topological phases, and topological quantum computing, with an aim to extend the research portfolio of the Algebra, Geometry and Integrable Systems Group;
- 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;
- Contributing to the supervision of junior researchers and PhD students and acting as a mentor to less experienced colleagues;
- Evaluating methods and techniques used and results obtained by other researchers and relating such evaluations to your own research;
- Contributing to, and encouraging, a safe working environment.

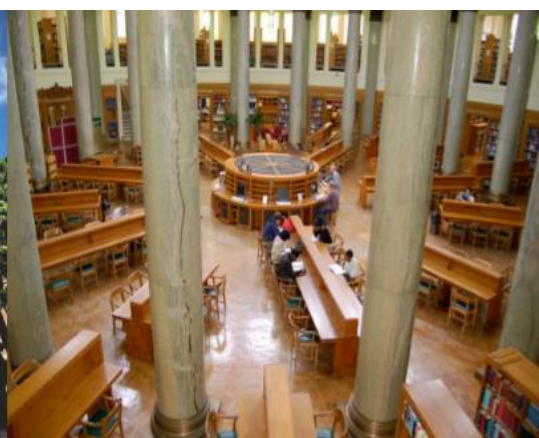
These duties provide a framework for the role and should not be regarded as a definitive list. Other reasonable duties may be required consistent with the grade of the post.

What will you bring to the role?

As a Research Fellow you will have:

- A PhD in one of the following areas: algebra, geometric topology, topological quantum field theory, mathematical models of topological phases of matter, topological quantum computing, or a closely allied discipline;
- Experience in topological quantum field theory or geometric topology;
- The ability to design, execute and write up research independently;
- 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;
- Good time management and planning skills, with the ability to meet tight deadlines;
- A proven ability to work well both independently and as part of a team;
- An ability to work accurately and carefully;
- A strong commitment to your own continuous professional development.





You may also have:

- 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;
- Evidence 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. 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
Tel: +44 (0)113 343 4433
Email: j.fariamartins@leeds.ac.uk

Professor Paul Purdon Martin
Tel: +44 (0)113 343 7787
Email: p.p.martin@leeds.ac.uk

Additional 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.

A diverse workforce
The Faculty of Mathematics and Physical Sciences is proud to have been awarded the Athena SWAN Bronze 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.

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

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 on our Criminal Records information page.