UNIVERSITY OF LEEDS

CANDIDATE BRIEF

Research Fellow in Mathematical Analysis,

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

Reference: EPSMA1004

Closing date: 24 November 2019

Fixed-term for 2 years

We will consider job share / flexible working arrangements

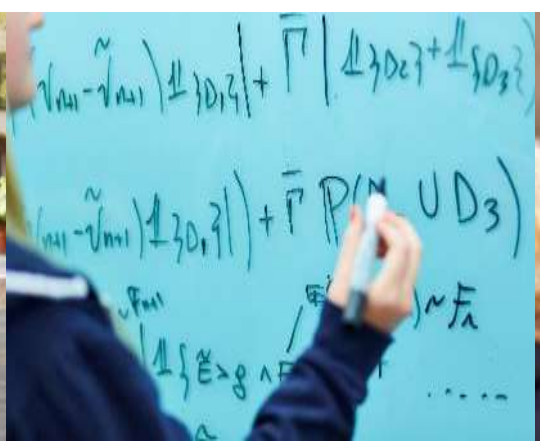
Research Fellow in Mathematical Analysis,
School of Mathematics,
Faculty of Engineering and Physical Sciences.

Are you an ambitious researcher looking for your next challenge? Do you have an established background in analysis of partial differential equations, spectral theory, or rigorous numerical analysis? Do you want to further your career in one of the UK's leading research intensive universities?

We are looking for a postdoctoral Research Fellow to work on our Leverhulme funded research project, Mathematical Analysis of Casimir Interactions. Casimir interactions between conducting materials can be understood as being induced by vacuum energy fluctuations of the electromagnetic field. The computation of Casimir forces between objects relies heavily on local spectral data that is derived from the spectral decomposition of the Laplace operator. These are connected via the Fourier and the Mellin transform to the local heat kernel and the local wave trace.

You will contribute to our project aim, which is the full mathematically rigorous analysis of these local spectral quantities. This will include asymptotic expansions with rigorous error estimates, representation formulae using scattering theory and perturbation theory. One of the applications of such an analysis is to make Casimir force computations rigorous and numerically stable. In a second stage of the project, you will be involved in seeking to implement stable numerical procedures for the computation of Casimir interactions in the existing softwage package BEM++, working in collaboration with the Co-Principal Investigator of the project, Prof. Timo Betcke at UCL. This part of the project is interdisciplinary, and you will engage with aspects of numerical analysis.

You will have a PhD in Mathematics or a closely allied discipline, together with knowledge of analysis, spectral theory, spectral geometry, or rigorous numerical analysis. Knowledge of rigorous quantum field theory is not required. You will have a willingness to engage in inter- and intra-disciplinary research, working both independently and with a larger team of researchers.



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 Professor Timo Betcke (UCL) and Professor Alexander Strohmaier;
- Generating independent and original research ideas and methods in the analysis of Casimir interactions, with an aim to extend the analysis research portfolio;
- 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.

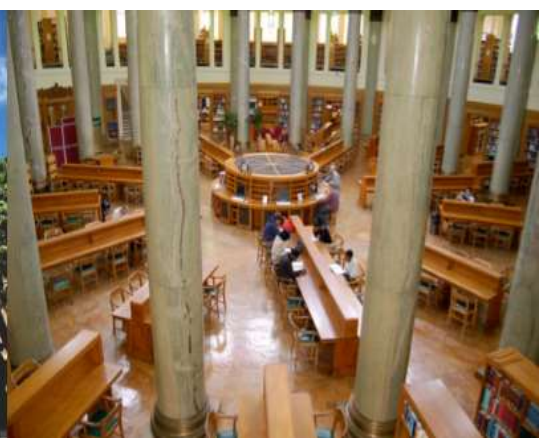
These duties provide a framework for the role and should not be regarded as a definitive list. Other reasonable duties may be required consistent with the grade of the post.

What will you bring to the role?

As a Research Fellow, you will have:

- A PhD in Mathematics (close to completion / OR have submitted your thesis before taking up the role) or a closely allied discipline;
- A strong background in analysis, spectral theory, spectral geometry or rigorous numerical analysis;
- The ability to design, execute and write up research independently;
- 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 Python or another programming langauge;
- Additional background knowledge and/or experience in Physics.

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 Alexander Strohmaier, Chair in Analysis
Tel: +44 (0)113 343 8884
Email: A.Strohmaier@leeds.ac.uk

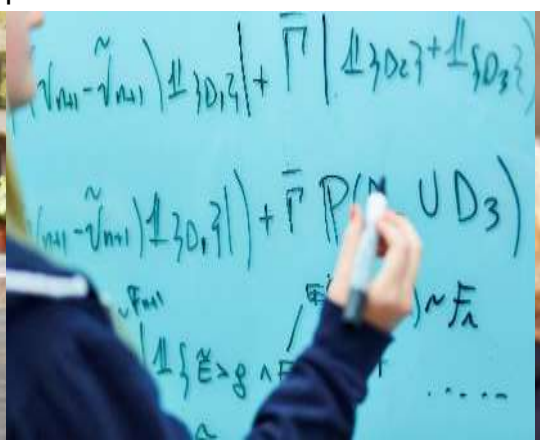
Additional information

Faculty and School Information

Further information is available on the research and teaching activities of the School of Mathematics. https://physicalsciences.leeds.ac.uk/info/6/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.

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.