

Research Associate in Theoretical Condensed Matter/Theory of Superconductivity

Job Ref: REQ230154

As part of the University's ongoing commitment to redeployment, please note that this vacancy may be withdrawn at any stage of the recruitment process if a suitable redeployee is identified.

School/Department summary

The Physics Department at Loughborough University has a vibrant community of scholars who are committed in supporting each other to deliver outstanding research. We have a well-established internationally renowned research in Condensed Matter Physics and Quantum materials and Nanoscience allowing to fabricate and measure different nanostructures and nanodevices. Physics Department at Loughborough University has a high international profile and staff members collaborate with the top physicists in the world.

Loughborough University holds the Athena SWAN Bronze award, recognising its commitment to improving the representation and career progression of women in STEM (science, technology, engineering and mathematics) subjects. The Department of Physics is committed to creating a diverse and inclusive culture in which staff and students are able to thrive, regardless of their gender.

Job Description

Applications are invited for a post-doctoral research associate to start on the 1st of September 2023 or as soon as possible thereafter. The successful applicant will be based in the Department of Physics at Loughborough University and will work in the group of Prof. Joseph Betouras mainly on superconductivity and in particular on the EPSRC, project "Elasto-superconductivity: a pathway to devising new unconventional superconductors".

The work will involve significant collaboration with the experimental group of Dr Clifford Hicks (Birmingham University) and the group of Dr Evgeny Kozik (King's College London) performing computational many-body calculations, with two more Research Associate positions to work on the same project. Partners on the project are Prof. Chubukov (University of Minnesota) and Prof. Andy Mackenzie (Max Planck Institute in Dresden).

Job Grade: Specialist and Supporting Academic, Grade 6

Job Purpose

To study theoretically the effects of uniaxial strain on materials that superconduct. Explain experimental data and predict physical properties of a range of materials. The work will involve a range of many-body techniques such as mean field theory, diagrammatic techniques, renormalization group theory and use of group theory.

Job Duties

- To carry out original theoretical research, using many-body techniques, such as mean field theory, diagrammatic techniques, and renormalization group theory mainly in the area of superconductivity
- To work towards the development of the theory of elasto-superconductivity.
- To model experimental systems such as strontium ruthenates, pnictides, cuprates and kagome' superconductors.
- To publish research results in leading international journals.
- To present research results at international conferences
- To collaborate with the research fellows and students of the group in joint research work.
- To collaborate with UK and international research partners (this is likely to involve international travel especially to Germany and USA on several occasions during the period of the appointment).
- To collaborate and attend collaborative meetings with the group of Drs Hicks at Birmingham and Kozik at KCL.

Points To Note

The purpose of this job description is to indicate the general level of duties and responsibility of the post. The detailed duties may vary from time to time without changing the general character or level of responsibility entailed.

Special Conditions

All staff have a statutory responsibility to take reasonable care of themselves, others and the environment and to prevent harm by their acts or omissions. All staff are therefore required to adhere to the University's Health, Safety and Environmental Policy & Procedures.

All staff should hold a duty and commitment to observing the University's Equality & Diversity policy and procedures at all times. Duties must be carried out in accordance with relevant Equality & Diversity legislation and University policies/procedures.

Successful completion of probation will be dependent on attendance at the University's mandatory courses which include Respecting Diversity and, where appropriate, Recruitment and Selection.

Organisational Responsibility

Reports to Prof. Joseph Betouras

Person Specification

Your application will be reviewed against the essential and desirable criteria listed below. Applicants are strongly advised to explicitly state and evidence how they meet each of the essential (and desirable) criteria in their application. Stages of assessment are as follows:

- 1 – Application
- 2 – Test/Assessment Centre/Presentation
- 3 – Interview

Essential Criteria

Area	Criteria	Stage
Experience	Experience in quantum field theoretical methods in condensed matter	1,3
	Experience of collaborative research work	1,3
	Work as an independent researcher	1,3
	Publications in international journals	1,3
	Use of Mathematica or Matlab or equivalent software	1,3
Skills and abilities	Excellent written and oral communication skills in English	1,3
	Teamwork skills	1,3
	Excellent time management skills	3
	Collaboration with experimental groups	1,3
	High attention to detail	3
Training	Willingness to undertake appropriate further training and to adopt new procedures as and when required	3
Qualifications	PhD or equivalent in Theoretical Physics	1
Other	Commitment to observing the University's Equal Opportunities policy at all times.	3

Desirable Criteria

Area	Criteria	Stage
Experience	Experience on superconductivity	1,3
Skills and abilities	Leadership skills and desire for a research career in Physics	3

Conditions of Service

The position is full time and fixed term for 3 years. Salary will be on Specialist and Supporting Academic Grade 6, £32,348 to £39,745 per annum, at a starting salary to be confirmed on offer of appointment.

The appointment will be subject to the University's normal Terms and Conditions of Employment for Academic and Related staff/Operational and Administrative staff, details of which can be found [here](#).

The University is committed to enabling staff to maintain a healthy work-home balance and has a number of family-friendly policies which are available at <http://www.lboro.ac.uk/services/hr/a-z/family-leave-policy-and-procedure---page.html>.

We also offer an on-campus nursery with subsidised places, subsidised places at local holiday clubs and a childcare voucher scheme (further details are available at: <http://www.lboro.ac.uk/services/hr/a-z/childcare-information---page.html>)

In addition, the University is supportive, wherever possible, of flexible working arrangements. We also strive to create a culture that supports equality and celebrates diversity throughout the campus. The University holds a Bronze Athena SWAN award which recognises the importance of support for women at all stages of their academic career. For further information on Athena SWAN see <http://www.lboro.ac.uk/services/hr/athena-swan/>

Informal Enquiries

Informal enquiries should be made to Prof. Joseph Betouras by email at J.Betouras@lboro.ac.uk.

Applications

The closing date for receipt of applications is **Monday 1 May 2023**. Interviews will be held in May 2023.