

Research Associate:

Cluster algebras, Teichmüller theory and Macdonald polynomials

Job Ref: REQ17299

As part of the University's ongoing commitment to redeployment, please note that this vacancy may be withdrawn at any stage of the recruitment process if a suitable redeployee is identified.

This is an intra-disciplinary project in Mathematical Sciences that draws ideas from representation theory, geometry and topology, differential and q-difference equations to establish a new link between cluster algebra theory, and the theory of Macdonald polynomials, a remarkable family of multi-variable orthogonal polynomials which encode most previously known symmetric functions. The aim is to construct a quantum cluster algebra for each family of Macdonald polynomials in such a way that the representation theory of the quantum cluster algebra involves the given family of Macdonald polynomials. The proposed methodology relies on the (quantum) Teichmüller theory of non-compact Riemann surfaces.

The Department of Mathematical Sciences at Loughborough University offers a vibrant community of researchers who are committed in supporting each other to deliver outstanding research. It consists of six research groups <http://www.lboro.ac.uk/departments/math/research/groups/>, in particular we have a well established internationally renowned research group in Geometry and Mathematical Physics.

Job Description

Job Grade: Specialist and Supporting Academic, Grade 6

Job Purpose: Conduct research under the direction of the principal investigator (PI) Prof. Marta Mazzocco on the EPSRC funded project "[Cluster algebras, Teichmüller theory and Macdonald polynomials](#)". The focus of the project will be to construct a quantum cluster algebra for each family of Macdonald polynomials in such a way that the representation theory of the quantum cluster algebra involves the given family of Macdonald polynomials.

Job Duties

1. To conduct research on the project described above. This will involve a combination of individual work, and collaborative work with others under the supervision of the PI.
2. To meet regularly with the PI, to discuss the progress of the project, and to report the findings of research undertaken individually.
3. To prepare journal publications of results arising from the project.
4. To take part in relevant research related activities within the Department of Mathematical Sciences. This may include both taking part and delivering research seminars, and to participate in relevant Working Groups that may be set up during the course of the project.
5. To participate in appropriate international conferences and, to contribute to the dissemination strategy of the project, present research findings. This may include giving a talk, presenting a poster, as well as holding discussions with other conference participants

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 the Principal Investigator: Prof. Marta Mazzocco

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 – Presentation
- 3 – Interview

Essential Criteria

Area	Criteria	Stage
Experience	Experience of conducting research in Mathematical Physics.	1, 3
Skills and Abilities	Oral communication skills sufficient to be able to address large audiences clearly and effectively.	3
	Ability to carry out high-level rigorous mathematical research.	1, 3
	Ability to work individually and to collaborate with others.	1, 3
Training	A willingness to undertake further training as appropriate and to adopt new procedures as and when required.	3
Qualifications	Close to completion or completed PhD in Mathematics or Theoretical Physics or equivalent.	1, 3
Other	Commitment to the dissemination of scientific results.	3
	Commitment to observing the University's Equal Opportunities policy at all times.	3

Desirable Criteria

Area	Criteria	Stage
Experience	Experience of publishing research outcomes.	1, 3
	Teaching experience.	1, 3

Conditions of Service

The position is full-time and fixed-term for 36 months. Salary will be on Specialist and Supporting Academic Grade 6, £29,301 per annum, subject to annual pay award.

The appointment will be subject to the University's normal Terms and Conditions of Employment for Academic and Related 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 [here](#).

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 [here](#))

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 Marta Mazzocco by email at m.mazzocco@lboro.ac.uk.

We have a commitment to gender equality and support the Athena SWAN charter. We encourage women to apply for this position as they are under-represented. All appointments will be made on merit.

Application

The closing date for receipt of applications is **15 May 2017**.