PhD studentship   (Full-time)

Institution	Xi'an Jiaotong-Liverpool University, China
Department	Department of Physics
Supervisors	Principle supervisor: Dr. Niels Gresnigt (XJTLU, Department of Physics) Co-supervisor: Dr. M.B.N. (Thijs) Kouwenhoven (XJTLU, Department of Physics) Co-supervisor: Dr. Martin Gorbahn (UoL, Department of Mathematical Sciences)
Application Deadline	Open until the position is filled
Funding Availability	Funded PhD project (world-wide students)
Project Title	A unified theory of particle physics based on division and Clifford algebras
Contact	Please email niels.gresnigt@xjtlu.edu.cn (XJTLU principal supervisor's email address) with a subject line of the PhD project title

Requirements:

The candidate should have a first class or upper second class honours degree, or a master's degree (or equivalent qualification), in physics or mathematics. Evidence of good spoken and written English is essential. The candidate should have an IELTS score of 6.5 or above, if the first language is not English. This position is open to all qualified candidates irrespective of nationality.

Degree:

The student will be awarded a PhD degree from the University of Liverpool (UK) upon successful completion of the program.

Funding:

The PhD studentship is available for three years subject to satisfactory progress by the student. The award covers tuition fees for three years (currently equivalent to RMB 80,000 per annum) and provides a monthly stipend of 5,000 RMB as a contribution to living expenses. It also provides up to RMB 16,500 to allow participation at international conferences during the period of the award. It is a condition of the award that holders of XJTLU PhD scholarships carry out 300-500 hours of teaching assistance work per year. The scholarship holder is expected to carry out the major part of his or her research at XJTLU in Suzhou, China. However, he or she is eligible for a research study visit to the University of Liverpool of up to three months, if this is required by the project.

Project Description:

The Standard Model of particle physics provides a mathematical description of the most basic constituents of matter observed in nature, and their interactions via three of the four fundamental forces of nature. Despite the model's overwhelming success, its underlying mathematical structure is not derived from more fundamental principles. Explaining the mathematical structure of the Standard Model remains a prominent challenges in physics. The focus of this project is to explain the properties and interactions of elementary particles in terms of division algebras, of which mathematics admits only four, and the Clifford algebras generated from them.

For relevant background to the project, see:
Gresnigt, N. G. (2018). Braids, normed division algebras, and standard model symmetries. *Phys. Lett. B*, *783*, 212-221,
Gillard, A. B., & Gresnigt, N. G. (2019). Three fermion generations with two unbroken gauge symmetries from the complex sedenions. *EPJ C*, *79*(5), 446,
And references therein.

For more information about doctoral scholarship and PhD programme at Xi'an Jiaotong-Liverpool University (XJTLU): Please visit

http://www.xjtlu.edu.cn/en/study-with-us/admissions/entry-requirements

http://www.xjtlu.edu.cn/en/admissions/phd/feesscholarships.html

How to Apply:

Interested applicants are advised to email…....@xjtlu.edu.cn (XJTLU principal supervisor's email address) the following documents for initial review and assessment (please put the project title in the subject line).

- CV
- Two reference letters with company/university letterhead
- Personal statement outlining your interest in the position
- Proof of English language proficiency (an IELTS score of 6.5 or above)
- Verified school transcripts in both Chinese and English (for international students, only the English version is required)
- Verified certificates of education qualifications in both Chinese and English (for international students, only the English version is required)
- PDF copy of Master Degree dissertation (or an equivalent writing sample) and examiners reports available

Informal enquiries may be addressed to Dr. Niels Gresnigt (niels.gresnigt@xjtlu.edu.cn), whose personal profile is linked below,
https://www.xjtlu.edu.cn/en/departments/academic-departments/mathematical-sciences/staff/niels-gresnigt