

PhD studentship (Full-time)



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| Institution | Xi'an Jiaotong-Liverpool University, China |
| School | School of Science |
| Supervisors | Principal supervisor: Dr Chen Xuan (XJTLU, Centre of maths and physics) Co-supervisor: Dr Jiuzhi Xue (JITRI) Co-supervisor: Dr Richard Potter (UoL, engineering department) |
| Application Deadline | Open until the position is filled |
| Funding Availability | Funded PhD project (world-wide students) |
| Project Title | Structural and Dynamic Properties of Nanoparticle Suspensions |
| Contact | Please email ChenXuan@liverpool.ac.uk (XJTLU principal supervisor's email address) or jiuzhi.xue@jitri-lci.com (JITRI supervisor's email) 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 related discipline.

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:

This PhD project is a collaborative research project between XJTLU (<http://www.xjtlu.edu.cn>) in Suzhou and JITRI (Jiangsu Industrial Technology Research Institute) Institute for Smart Liquid Crystals in Changshu. The student will be registered as an XJTLU PhD student but is expected to carry out the major part of his or her research at the Institute in in Changshu.

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). In addition, during the period of undertaking main research at Institute for Smart Liquid Crystals, the PhD candidate will be provided with monthly living allowance at a standard of 5,000 RMB by JITRI Institute for Smart Liquid Crystals

Project Description:

This project studies liquid crystals on both the microscopic and macroscopic levels. Successful completion of this PhD programme could lead to worldwide career opportunities in academia and high-tech industrial sectors like software, R&D, biomed, robotics and smart manufacturing alike.

When suspended in a solvent, nanoparticles with anisotropic optical and dielectric properties may be manipulated by an external electric field to control the light propagation through the suspension. Such devices may find wide range of applications as light modulating devices in architectural windows and in consumer electronic devices. There is a plethora of unaddressed questions concerning the optical properties of individual nanoparticles and the suspensions, the structure of the nanoparticle suspension depending on the particle shape, size distribution, and the concentration. There is an equally plethora of questions concerning the dynamic behavior of the nanoparticles under the application of an external stimulus such as electric field, and their relaxation upon the removal of the external stimulus. The proposed thesis work will focus on a dichroic nanorod system, where nanoparticles absorb light differently depending on the relative angle between nanoparticles and the polarization of light, to study the optical, structural, and dynamic properties of the suspension, its response to the application of an electric field, and the relaxation dynamics upon the removal of the applied field.

On the macroscopic level, liquid crystals can form liquid crystal polymers/elastomers/gels when crosslinked to a polymeric network. We will study the deformation of such liquid crystal polymers in response to force, heat, light, electric field etc. The proposed work will be mainly based on continuum mechanics and finite element analysis.

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/feescholarships.html>

How to Apply:

Interested applicants are advised to email ChenXuan@liverpool.ac.uk (XJTLU principal supervisor's email address) or jiuzhi.xue@jitri-lci.com (JITRI supervisor's email) 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