

PhD studentship (Full-time)

Institution	Xi'an Jiaotong-Liverpool University, China
School	Design School
Supervisors	Principal supervisor: Dr Charles Loo (XJTLU) Co-supervisor: Dr Jinfeng Leng (JITRI) Co-supervisor: Professor Yuyuan Zhao (UoL)
Application Deadline	Open until the position is filled
Funding Availability	Fully Funded PhD project (world-wide students)
Project Title	Lightweight design and development of graphene / aluminum composites for new energy vehicles based on carbon neutralization
Contact	Please email charles.loo@xjtlu.edu.cn (XJTLU principal supervisor's email address) or JITRI supervisor's email: jfleng@126.com 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 Mechanical Engineering, Manufacturing Engineering, Materials Engineering, Applied Mechanics or related fields.

Knowledge of finite element modelling is required.

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) DINGMEI New Material Technology Co., Ltd. in Kunshan. 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 Kushan.

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 in Changzhou, the PhD candidate will be provided with monthly living allowance around RMB 4000-6000 by DINGMEI New Material Technology Co., Ltd.

Project Description:

6xxx and 7xxx aluminum alloys are widely used in the fields of aerospace and rail transit because of their advantages of high specific strength, good machinability, and good corrosion resistance. With the development of automobile lightweight, it has become an inevitable trend that aluminum alloy partially replaces steel materials to reduce weight.

With the increasing demand for new energy vehicles, lightweight aluminum structural parts are inevitable. In that perspective, we propose to adopt a nano-phase strengthening technology of aluminum matrix composites and apply a rapid cooling process in the engineering semi-continuous casting to realize the lightweight design. The key technology will explore the bonding mechanism of nano-phase /Al interface, and reveal the evolution mechanism of the precipitation phase in the Al matrix and strengthening mechanism. The project aims to achieve high strength and high toughness aluminum matrix composites, ensuring the homogeneity of macro performance and the stability of product performance.

Keywords: Carbon neutralization, Lightweight, Metal matrix composites, Nano carbon reinforced phase, Materials design, Numerical simulation

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>

Supervisor Profile:

Principal Supervisor:

Dr. Charles Loo is an Assistant Professor in Structural and Materials Engineering in the department of Civil Engineering at Xi'an Jiaotong-Liverpool University (XJTLU). He holds a BEng. (1st Class Hons) in Civil Engineering, and a MEng. in Structural and Foundation Engineering and a PhD in Structural Engineering from the University of Sydney. Prior to joining XJTLU, he was a Senior Lecturer at Curtin University. Dr. Loo also worked in the consulting

industry for a number of years, designing complex structural facilities. He is a Chartered Professional Engineer with Engineers Australia with the Civil and Structural Engineering colleges (MIEAust CPEng NER APEC Engineer IntPE Aus). His research interests include multi-physical computational modelling, inverse analysis and optimisation, metamaterials, structural engineering, composites and smart sensors.

JITRI co-supervisor:

Jinfeng Leng, Vice President of Scientific Research of D.Mag New Material Technology Co.,Ltd, obtained PHD degree from Institute of Metal Composite Materials and Engineering in Harbin Institute of Technology. As member of the Graphene Alliance Standardization Committee, she Participated in the formulation of multiple graphene material standards. She has 23 years of experiences in developing the preparation and application of high-performance aluminum alloys and composites, and published nearly 50 related academic papers in Scripta Materialia and other magazines. In the past five years, he has been the first inventor to authorize 31 invention patents for graphene composites. At present, she has also led and assumed more than 10 research projects in the National Natural Science Foundation of China and the business community, with a total amount of more than 6 million RMB. Her research group has mastered the technology of low-cost, large-scale and high-uniformity preparation of nano-reinforced metal matrix composites, and promoted the commercialization of nano-reinforced metal matrix composites. Based on the results of this research, She Won the Bronze π Award of Kunshan Zu Chongzhi Public Relations Plan in 2020 to develop and produce nano-metal matrix composite materials in aerospace, rail transit, and automobiles etc.

How to Apply:

Interested applicants are advised to email charles.loo@xjtlu.edu.cn (XJTLU principal supervisor's email address) or JITRI supervisor's email: jfleng@126.com 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 if applicable