

### PhD studentship (Full-time)

Institution	Xi'an Jiaotong-Liverpool University, China
School	School of Science
Supervisors	Principal supervisor: Professor/Dr Chen Xuan (XJTLU) Co-supervisor: Professor/Dr Zuguo Bao (JITRI) Co-supervisor: Professor/Dr Hao Yu (XJTLU) Co-supervisor: Professor/Dr William Christian (UoL)
Application Deadline	Open until the position is filled
Funding Availability	Funded PhD project (world-wide students)
Project Title	Simulation for compression molding and mechanical properties of woven carbon fiber reinforced composites
Contact	Please email <a href="mailto:chen.xuan@liverpool.ac.uk">chen.xuan@liverpool.ac.uk</a> (XJTLU principal supervisor's email address) or <a href="mailto:baozuguo@jitri-amrd.com">baozuguo@jitri-amrd.com</a> 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 Materials, mechanical engineering, mechanics or related subjects.

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) Yangtze Delta Region Institute of Advanced Materials in Suzhou. 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 Suzhou.

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 Suzhou, the PhD candidate will be provided with monthly living allowance at a standard RMB 5000 by Yangtze Delta Region Institute of Advanced Materials.

### **Project Description:**

Woven prepreg are commonly employed as raw materials for carbon fiber reinforced polymer(CFRP) composites. In compression molding, the prepreg will generate uneven deformation in the product which is determined by the localized strain. Thus, yarn angle in the product is usually different with the raw materials, which will cause the improper design for both manufacturing and performance of the products. This project aims to investigate the microstructure evolution of woven prepreg and its connection with mechanical properties of CFRP during the compression molding and develop a simulation tool for compression molding and mechanical properties of woven carbon fiber reinforced composites. Specifically, simulation of compression molding will be conducted to predict the microstructure evolution of woven prepreg in CFRP. Representative volume element method will be developed to construct relationship between the microstructure and material properties. Material properties and microstructure are tested for model input/validation. Finally, a design tool for woven CFRP product is developed by integrating the compression molding and mechanical properties prediction, providing the optimized solution including the materials, geometry, and manufacturing.

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>

### **Supervisor Profile:**

#### **Principal Supervisor:**

<https://www.xjtlu.edu.cn/en/departments/academic-departments/foundational-mathematics/staff/chen-xuan>

#### **JITRI co-supervisor:**

包祖国博士 (Dr. Zuguo Bao)

长三角先进材料研究院研发主管

Research Manager at Yangtze Delta Region Institute of Advanced Materials

包祖国博士 2015 年在南京航空航天大学获得材料加工工程专业博士学位，2016-2020 年，在福特汽车公司担任研究及先进工程技术专家，负责塑料及聚合物基复合材料的研究与开发。2020 年加入长三角先进材料研究院，担任工业应用材料大数据平台研发主管，负责复合材料的数据库建设与数字化应用工具开发。

Dr. Zuguo Bao received his Ph. D. majored in materials processing engineering in Nanjing University of Aeronautics and Astronautics in 2015. In 2016 to 2020, he worked in Ford Motor Company, mainly focused on R&D of plastics and polymer-based composites. In 2020, Zuguo Joined in Yangtze Delta Region Institute of Advanced Materials as the research manager, focusing on R&D of material database and digital product design tools for polymer based composites

### **How to Apply:**

Interested applicants are advised to email [chen.xuan@liverpool.ac.uk](mailto:chen.xuan@liverpool.ac.uk) (XJTLU principal supervisor's email address) or [baozuguo@jitri-amrd.com](mailto:baozuguo@jitri-amrd.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