

PhD studentship (Full-time)

Institution	Xi'an Jiaotong-Liverpool University, China
Department	Department of Mathematical Sciences
Supervisors	Primary supervisor: Dr David Liu (Xi'an Jiaotong-Liverpool University) Co-supervisors: Dr Stephen James Shaw (Xi'an Jiaotong-Liverpool University), Dr Emmanuel Tadjouddine (Xi'an Jiaotong-Liverpool University), Dr Rene Steijl (University of Liverpool, UK);
Application Deadline	Open until the position is filled
Funding Availability	Funded PhD project (world-wide students)
Project Title	Granular Dynamics Simulations of Impact Attritions of Cohesive Agglomerates of Fine Particles

Requirements:

Suitable candidates should have a undergraduate degree in engineering, mathematics, computational mechanics, applied physics or related areas, with an average above 70/100 or GPA above 3.0 out of 4.0 (US system). Knowledge in granular dynamics modelling, discrete element method (DEM), computational fluid dynamics or numerical methods in general and a good understanding of micromechanics of particulates and scientific programming would be advantageous. Preference will be given to candidates with a Master's degree with good programming skills in FORTRAN, C/C++ and MATLAB. Candidates should have strong motivation to learn and strong interest in granular dynamics modelling and DEM coding. Furthermore, an appropriate qualification in the English Language together with excellent communication and organizational skills are required.

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 3500 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:

Computer modelling of small agglomerate impact has been a very active research with an aim to understand its physical mechanism therefore to help industry with better control of their product quality. However, our final goal is to provide a more advanced model that is capable of studying the attritions and breakage of cohesive agglomerate of fine particles. The first objective of this research is the modeling of impact attritions of small adhesive agglomerates by using discrete element method (DEM). Advanced inter-particle contact models will be incorporated into our current DEM program which will enable us to investigate many sophisticated physical behaviors of small agglomerates during collisions. A better understanding of attrition/breakage mechanism will be gained by examining quantitatively the data generated from such numerical experiments. There will also be a potential for the project to be developed into a field of particle agglomerates immersed in liquid or interacting with air flow.