

XJTLU-XJTU-UoL Joint Doctoral Supervision Project (Full-time)

Reference No.	SFXJTU2523
XJTLU School	Academy of Life and Natural Sciences
PhD Programme	Chemistry
Supervisors	XJTLU supervisor: Dr Yi Lin XJTLU co-supervisor: Dr Xuan Xue XJTU supervisor: Professor Han Yan UoL supervisor: Professor Alessandro Troisi
Project Title	Study of the non-fullerene acceptor based quasi-single-component organic solar cell with spontaneous photo-charge generation 基于自生光电荷效应的单受体有机太阳能电池研究
Application Deadline	Open until the position is filled

Requirements:

A UK first-class or upper second-class honours Bachelor's degree and a UK Master's degree with Merit (or their equivalent) are required for PhD admissions. Exceptional candidates holding only a Bachelor's degree may be considered on an individual basis.

Evidence of good spoken and written English is essential. The candidate should have an IELTS (or equivalent) score of 6.5 or above, if the first language is not English.

For more information about entry requirements and admission procedures of PhD programme at XJTLU, please visit:

[Entry Requirement - Xi'an Jiaotong-Liverpool University](#)

[How to Apply - Xi'an Jiaotong-Liverpool University](#)

Other Requirements (if any):

Academic Background Requirements: Candidates should have a background in physics, chemistry, photovoltaics, materials science, or related fields. Prior publication of significant papers in SCI journals, experience in solar cells fabrication and characterization are preferred. Candidates should possess strong learning abilities, proficiency in reading English literature, excellent teamwork skills, be proactive and responsible, and have strong hands-on capabilities.

Programme Structure and Fees:

Doctoral students in the joint programme are registered with both XJTLU and the UoL. Upon successful completion of the programme, the students will be awarded a PhD degree from University of Liverpool. During their doctoral studies at XJTLU, students are expected to

conduct research at XJTU as visiting students. Additionally, students have the opportunity to apply for a short-term research visit to the UoL if the project requires it.

The joint doctoral programme is offered on a full-time basis, with a typical duration of three to four years. The tuition fee is RMB 99,000 per year.

Project Description:

To cultivate research talents with global leadership, interdisciplinary innovation capabilities, and international research collaboration capabilities, Xi'an Jiaotong-Liverpool University (XJTLU) fully leverages its characteristics of international education and builds upon the long-established strategic cooperation among XJTLU, Xi'an Jiaotong University (XJTU), and the University of Liverpool (UoL). This initiative integrates top-tier research resources to launch a Joint Doctoral Supervision Programme across the three institutions.

The properties of spontaneous photo-charge generation and bipolar charge transport in the non-fullerene acceptor (NFA) provide the opportunity to develop an efficient, low-cost, and stable single-component organic solar cell (SCOSC). Unlike the expectation, the NFA SCOSC shows poor photovoltaic performance in practice. Therefore, it urges people to explore the role of spontaneous photo-charge in NFA on the device operation of SCOSC. To fulfill the study requirements on device uniformity and repeatability, a quasi-SCOSC with less than 1 wt.% donor content in the active layer is used as the testbed. Starting from quantitatively determining the spontaneous photo-charge generation and collection yields in SCOSC, we will clarify the much larger short-circuit current loss as compared to the reduced photon absorption in bulk heterojunction solar cell. We also plan to clarify the debatable open-circuit voltage origin by comparing it with the values of Schottky bias at anode and voltage.

Joint Supervisory Team:

XJTLU supervisor: Dr Yi Lin

XJTLU co-supervisor: Dr Xuan Xue

XJTU supervisor: Professor Han Yan

UoL supervisor: Professor Alessandro Troisi

How to Apply:

Interested applicants are advised to email yi.lin@xjtlu.edu.cn the following documents for initial review and assessment (Please include the project title in the subject line).

- CV
- Two formal reference letters
- Personal statement outlining your interest in the position
- Certificates of English language qualifications (IELTS or equivalent)
- Full academic 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