

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

Reference No.	SFXJTU2511
XJTLU School	School of Science
PhD Programme	Chemistry
Supervisors	XJTLU supervisor: Dr Lifeng Ding XJTU supervisor: Professor Jian Lin UoL supervisor: Dr Haifei Zhang
Project Title	Visible Detection of Radionuclides based on Metal-Organic Framework 基于金属有机框架材料的核素可视化检测研究
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):

Candidates applying for this position are expected to hold a background in one of the following disciplines: Chemistry, Materials Science and Engineering, Physics, or Artificial Intelligence.

Programme Structure:

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 three to six-month research visit to UoL.

Project Description:

Long-lived fission products pose significant environmental risks due to their tendency to migrate with groundwater over extended geological disposal periods, ultimately contaminating natural water bodies and causing long-term ecological damage. Therefore, the real-time, rapid, large-scale, and accurate detection of these radionuclides has become a critical challenge in radioactive pollution prevention. To address this issue, the applicant proposes the development of metal-organic frameworks (MOFs) functionalized with dual/multi-emissive fluorescent groups. Leveraging the fluorescence color-changing properties of MOFs in conjunction with the RGB (Red, Green, Blue) color detection principle, this approach aims to enable visual and quantitative detection of radioactive nuclides. Furthermore, an RGB reading device will be designed to convert fluorescence color information into digital RGB values, allowing for the establishment of a quantitative calibration curve correlating nuclide concentration with RGB response. This innovation seeks to overcome the limitations of conventional analytical methods that depend on expensive and specialized instrumentation. The proposed fluorescence probe technology not only mitigates the drawbacks of traditional techniques—such as complex sample preparation, high costs, and the inability to perform real-time or on-site detection—but also offers a cost-effective, user-friendly, and highly sensitive alternative. This method holds great promise for widespread application in environmental monitoring and nuclear safety.

Joint Supervisory Team:

XJTLU supervisor: [Dr Lifeng Ding](#)

XJTU supervisor: [Professor Jian Lin](#)

UoL supervisor: [Dr Haifei Zhang](#)

How to Apply:

Interested applicants are advised to email Dr Lifeng Ding (Lifeng.Ding@xjtlu.edu.cn) or Professor Jian Lin (jianlin@xjtu.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