Postgraduate Scholarship Information Sheet (Advert)

Scholarship Project Title	**Nanoscale spectroscopy and hyperspectral imaging of low dimensional materials for novel sensor technologies**
Advert Reference number	**TURISE_2024_207**
Supervisor(s)	Joseph O'Mahony (SETU Waterford)
Research Group	PMBRC
Department /School/Faculty	**Engineering Technology**
Duration	4 Years/48 Months
Status: Full-time / part-time	Full Time
Funding information	TU RISE
Value of the scholarship per year	Stipend: €19,000 Fees of €5,750 per annum Research costs- €5,000 per annum with an additional €1,650 awarded for the purchase of a laptop in year 1
Closing date and time	**14th August 2024 at 4pm Irish Time**
Interview date	August 2024
PhD commencement date	**Immediately**

Project Key Words: (enter 3 to help advertise on online platforms)

Scanning Probe Microscopy (SPM), Biomaterials, 2D Materials.

Post summary

Correlating spatial chemical information with the mechanical and electronic properties of low dimensional materials remains a specific challenge in modern nanoscience, limiting our understanding of the mechanisms underpinning the enhancement in sensitivity of Surface Plasmon Resonance (SPR) and Surface Enhanced Raman Scattering (SERS) biosensors that incorporate 2D materials. Recent developments in SPM offers the opportunity for correlative spectroscopic and mechanical investigations to observe the impacts of strain on the optoelectronic properties of low dimensional materials. In this work, Photo-induced Force Microscopy and scattering-Scanning Near Field Optical Microscopy will be employed to achieve a nanoscale study of 2D materials. The project will specifically study the electromagnetic mechanisms that enhance the SPR response and the chemical mechanisms that enhance the SERS response of these materials when used as biosensor. The project is multi-disciplinary, and the successful candidate will develop expertise in optical scanning probe microscopy techniques, nanomaterials/device simulation and sensor fabrication. The successful candidate will undertake a minimum 12 weeks placement in a leading multinational company.

Knowledge & Experience
Essential

- Applicants should have a good primary degree (First or 2.1 Honours) or M.Sc. in an appropriate discipline (Physics, Chemistry, Biology, Materials Science or Engineering). The successful candidate should be highly self-motivated and have excellent laboratory skills.
- The successful candidate will be required to spend a minimum of 12 weeks on placement with a leading multinational company and should be comfortable working within a multidisciplinary environment.

Desirable

It is desired that the successful applicant will have a good knowledge of Scanning Probe Microscopy and some previous experience of working within a research environment at an undergraduate or postgraduate level. Experience with biomolecular deposition and characterisation techniques would be advantageous.

Skills & Competencies

Essential

- Applicants whose first language is not English must demonstrate on application that they meet SETU's English language requirements and provide all necessary documentation. See Page 7 of the Code of Practice
- In order to be **shortlisted for interview,** you must meet the SETU English speaking requirements so please provide evidence in your application.
- The candidate is expected to have excellent communication skills and have a high proficiency with Word, Excel and PowerPoint.

Desirable

- Excellent written and verbal communication skills.
- Previous experience with using Scanning Probe Microscopes.
- Previous experience with biomolecule deposition techniques.
- Previous IR/FTIR/Raman spectroscopy experience.

Further information

For any informal queries, please contact <Joseph O'Mahony> on email <Joseph.OMahony@SETU.ie >

For queries relating to the application and admission process, please contact the Postgraduate Admissions Office researchadmissions@setu.ie or telephone +353 (0)51 302883.

For queries relating to the funding programme, please email scholarships2024@setu.ie

University Website https://www.setu.ie/

Application procedure

Download the Research PhD/MSc Application Form from the SETU website and return the completed application to researchadmissions@setu.ie quoting **a TURISE_2024_207** in the email subject line.

Please note that paper submissions will not be accepted.

The University may decide to interview only those applicants who appear from the information they provided, to be the most suitable in terms of experience, qualifications and other requirements of the post.

The University will short-list and interview those applicants who provide the most suitable information in terms of experience, qualifications and other requirements relevant to the scholarship.

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