

Postgraduate Scholarship Information Sheet

Scholarship Project Title	Development, Optimisation and Environmental Validation of Seaweed-Based Biofoams as Sustainable Alternatives to Polystyrene Flotation Materials
Advert reference number	SETU_CW_2026_01_SPONS
Supervisor(s)	Dr Adriana Cunha Neves (SETU Carlow) Dr David Culliton (SETU Carlow) Dr Deirdre Gleeson (SETU Carlow)
Research group	Organic Materials Valorisation & Biopolymers Research Group
Department /School/Faculty	Applied Science
Duration	4 Years
Status: Full-time / Part-time	Full Time
Funding information	SETU PhD Co-fund
Value of the scholarship per year for four years	Stipend: €22,500 per annum Fees of €5,750 per annum (covered by scholarship) Research costs - €3,000 per annum
Closing date and time	Monday, 5 October 2026 at 4pm Irish Time
Interview date	As soon as possible
PhD commencement date	January 2027

Project Key Words: biopolymers; marine foams; circular economy

Post summary:

Expanded polystyrene (EPS) is widely used in marine flotation applications due to its low cost and favourable buoyancy properties; however, its persistence in the environment and contribution to marine plastic pollution pose significant sustainability challenges. This project aims to develop scalable seaweed-based biofoams as environmentally sustainable alternatives to conventional polystyrene flotation materials for marine use.

This research will focus on the formulation and optimisation of novel biofoams derived from seaweed biomass, with emphasis on achieving the mechanical performance, durability and buoyancy required for marine use. Comprehensive material characterisation will be undertaken to benchmark the developed materials against existing commercial flotation foams. The environmental performance of the biofoams will be assessed through degradation studies under marine conditions, evaluation of ecotoxicity, and investigation of potential impacts on marine biodiversity.

The most promising formulations will be scaled up and manufactured as semi-pilot-scale flotation blocks for deployment and validation in operational marina environments in collaboration with Inland and Coastal. In parallel, a life cycle cost assessment will be conducted to evaluate the economic feasibility of the technology and compare its performance with conventional polystyrene systems across production, deployment, maintenance and end-of-life stages.

The project will generate new knowledge in sustainable biomaterials, provide a pathway towards environmentally responsible flotation technologies, and support the transition of marine infrastructure towards circular and low-impact materials. The outcomes are expected to contribute to reducing plastic pollution while creating commercially viable alternatives for the marine sector.

Person specification

Qualifications

Essential

- Honours Degree (minimum 2:1) in Material sciences, Material engineering, Biology, Biochemistry or related disciplines
- Fundamental knowledge of biochemistry
- Basic understanding of experimental design and scientific research methods
- Experience in laboratory-based research during undergraduate projects or internships
- An interest in sustainability, biomaterials or circular bioeconomy research

Desirable

- MSc in areas related to Sustainability, Material sciences, Material engineering, Biology or Biochemistry

Knowledge & Experience

Essential

- Fundamental knowledge of biochemistry
- Basic understanding of experimental design and scientific research methods
- Experience in laboratory-based research during undergraduate projects or internships
- An interest in sustainability, biomaterials or circular bioeconomy research

Desirable

- Knowledge of the formulation and characterisation of biomaterials, and an understanding of their environmental impact
- Experience in material testing
- Knowledge of microbial ecology, or environmental microbiology
- Basic skills in statistical analysis or programming (e.g., R or Python)
- Experience in multidisciplinary science and working with multidisciplinary teams

Skills & Competencies

Essential

- Strong analytical and problem-solving skills
- Ability to plan and conduct laboratory experiments
- Excellent organisation and time management
- Ability to work independently and collaboratively within a research team
- Strong written and verbal communication skills
- Motivation to undertake interdisciplinary research combining biochemistry, materials science, and environmental science

- 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.

Desirable

- Skills in scientific writing and literature review
- Experience presenting research findings (e.g., poster or oral presentations)
- Interest in science communication and stakeholder engagement
- Ability to work across interdisciplinary research environments involving academia and industry

Further information

For any informal queries, please contact Dr Adriana Neves on email adriana.cunhaneves@setu.ie.

Application procedure

Complete the online Application Form from the [SETU website](#) quoting the advert reference number from above.

Please ensure that you upload all supporting documents as part of your submission.

Please note that applications must be submitted by this route.

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

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

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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