

KTP Associate in disruptive technology for green hydrogen

REQ231124

Period: 24 months

Salary: £33,000 - £36,000 per annum (Confirmation on offer of appointment) plus £2,000 training budget per year

Application deadline: 30th November 2023 (Please note shortlisting may occur before the closing date and therefore applications may change at short notice if a suitable candidate is found sooner).

Due to the source of the project funding, the employment start date can be no later than 15th January 2024. Any visa application and/or notice period from current employment, must also be completed before this date.

Key words: Hydrogen, Electrodes, Fibre manufacturing

Project Title: Fibre manufacture for battolysers

About the project

This project aims to develop innovative processes for low-cost fibres manufacture, leading to new electrode technologies for integrated battery and electrolyser (battolyser) systems, enabling low-cost green hydrogen generation.

Hydrogen demand reached 87million metric tons in 2020 and is rapidly growing, with production valued at \$130billion (2021). Yet 95% of hydrogen is produced using fossil-fuels. Sustainable “green-hydrogen” production methods are urgently required.

Sustainable hydrogen generation through electrolysis of water is possible using electrolysers, though manufacturing scale-up is restricted by the rare earth metal requirement of electrolysers. Battolysers combine battery and electrolyser technologies with potential to reduce costs, increase scalability and create competitive advantage over electrolyser technology. Commercially viable battolysers are yet to reach market.

New, affordable alloy fibre materials for sale as electrodes will be developed using Fibretech’s proprietary manufacturing processes, combined with Loughborough’s expertise in electrochemistry for hydrogen containment/catalysis and energy storage for demand management. The KTP leads to reduction of costs of

existing products and new product development, including electrodes for hydrogen generation. Development will require materials chemistry, alloy-fibre manufacturing and full lifecycle testing, to construct commercial prototypes.

Fibre Technology Ltd

Fibretech is an established manufacturing business producing stainless steel fibre products for distribution across the UK and mainland Europe. They serve multiple sectors with ultra-high temperature resistant materials including Automotive; Aerospace; Petroleum Refining; Refractories; Mining & Tunnelling; Metal Production; Civil Engineering; Power Generation; Cement Production and Incineration industries.

The company's product range includes its melt extract fibres, cut-wire and polypropylene Fibres, which can be added to all monolithic refractories, in a variety of mixes, to improve working life, by enhancing toughness. These have been sold by Fibretech for more than 40 years. Their construction range is used in reinforcement, whilst their automotive products include market leading melt overflow exhaust filaments called Microtex, which withstands extremely high temperatures for high performance vehicles, and provides thermal protection and noise attenuation over a wide audible frequency range. Fibretech's aerospace fibre products offer alternatives to conventional aluminium panel sheets, to improve stiffness for a low areal density, called Fibresheet, and melt extract fibres for high temperature reinforcement for launchpads.

Fibretech's technology division delivers research and development activities, assisting customers with bespoke product requirements, delivering collaborative innovation with partners. They continually seek new application opportunities for fibres, fibre networks, composites and continuous filamentary materials across industries.

This 24-month project, between Loughborough University and Fibretech, is joint funded with UKRI Innovate UK.

Loughborough University

Loughborough University is ranked in the top ten in the most recent Complete University Guide Guardian League Table and the Times Good University Guide. Its position as a research-leading university is confirmed through its recognition as one of the UK's Top-10 research-led universities in the most recent research excellence framework (REF 2014). It has been awarded a record of seven Queen's Anniversary prizes for its research impact to society and UK industry.

Loughborough University has outstanding research in science and engineering and world-class research facilities. The Wolfson School of Mechanical, Electrical and Manufacturing Engineering is one of the largest engineering Schools in the UK. The school is home to the Centre for Renewable Energy Systems Technology (CREST), which is one of the largest and leading UK sustainable energy research centre. CREST's research is innovative, excellent and relevant, influencing industry, policy makers, researchers and educators across the world. The range of projects in this research area provide an excellent environment to support this project. Chemistry research within the School of Science at Loughborough is incredibly diverse. We work with scientists from other disciplines at universities around the world and within industry to address some

of the biggest global challenges that face us today. Chemistry at Loughborough has been a major beneficiary of a more than £65M investment in infrastructure. This investment includes our 'STEMLab', a state-of-the-art laboratory space – and a new home for Chemistry with world-class research facilities available to support this project.

About the KTP Associate Role

The Associate will be operating in a fast-moving manufacturing business within a competitive environment. The KTP requires a range of skills including technical, applied engineering, business operations, communication and marketing.

The KTP Associate will be based primarily at the Company premises in Fibre Technology Ltd, Brookhill Road, Pinxton, Nottingham, NG16 6NT and will also spend time at Loughborough University with the academic team. They will be supervised by Dr Benjamin Buckley, with extra guidance from Prof D Strickland and Dr J Barton. The Associate will form an integral part of the company research and development team, working closely with company partners and supervisory team. As a KTP Associate the successful applicant will have access to a wide range of commercial, R&D and management training programmes as well as technical training resources and facilities at Loughborough University.

For information contact:

Dr B Buckley (b.r.buckley@lboro.ac.uk) or Prof D Strickland (d.strickland@lboro.ac.uk)

Job Description and Person Specification

Job Grade: Other

Job Purpose

The KTP Associate will:

- Work with stakeholders, including senior leaders, commercial, sales and marketing functions, academic experts and multi-disciplinary scientists, developing networks across the business to understand project requirements and deliverables.
- Develop understanding of battolyser chemistry combinations through exploratory research.
- Develop and build a battolyser test rig for undertaking automated durability testing.
- Undertaking small scale electrode manufacture.
- Testing electrodes in the durability tester.
- Evaluation of solutions.
- Future market preparation and dissemination.
- Produce and deliver reports to the senior management team and employees across the business functions at different organisational levels.
- Provide training materials/workshops to employees, collaborators and customers.

Job Duties

- Carry out the KTP project tasks and deliver the outcomes as outlined in the project work plan.
- Manage the project and disseminate the findings to the project team.
- Undertake KTP management training, as well as personal development training and courses as deemed necessary.
- Write R&D reports, and present these at the Local Management Committee (LMC) meetings.
- To undertake such other duties as may be reasonably requested and that are commensurate with the nature and grade of the post.

Points to Note

The purpose of this job description is to indicate the general level of duties and responsibility of the post. The detailed duties may vary from time to time without changing the general character or level of responsibility entailed.

Applicants must have completed their last qualification (degree, masters, PhD), no more than five years before closing date.

Special Conditions

All staff have a statutory responsibility to take reasonable care of themselves, others and the environment and to prevent harm by their acts or omissions. All staff are therefore required to adhere to the University's Health, Safety and Environmental Policy & Procedures.

All staff should hold a duty and commitment to observing the University's Equality & Diversity policy and procedures at all times. Duties must be carried out in accordance with relevant Equality & Diversity legislation and University policies/procedures.

Successful completion of probation will be dependent on attendance at the University's mandatory courses, which include Respecting Diversity and, where appropriate, Recruitment and Selection.

Organisational Responsibility

Reports to the KTP Supervisor: Dr B Buckley (b.r.buckley@lboro.ac.uk)

Person Specification

Your application will be reviewed against the essential and desirable criteria listed below. Applicants are strongly advised to explicitly state and evidence how they meet each of the essential (and desirable) criteria in their application. Stages of assessment are as follows:

- 1 – Application
- 2 – Presentation
- 3 – Interview

Essential Criteria

Area	Criteria	Stage
Qualifications	Associate will be qualified to a minimum of a Masters' degree level in one of the following subject areas: Chemistry, Chemical Engineering, Renewable Energy, Energy Storage, Hydrogen Chemistry or Engineering.	1,3
Experience	Practical skills in setup of small-scale rigs and testing prototypes, this may be evidenced within a university project or previous technical role.	1,2,3
Knowledge and Experience	Analytical skills to manage, analyse and interpret data.	1,2,3
Skills and abilities	Project management skills with demonstrable achievement of results.	1,3
	Ability to work both independently and as part of a team.	1,2,3
	Ability to communicate with a wide range of company and academic personnel.	1,2,3
	Excellent communication / presentation skills.	1,2,3
	Excellent technical writing skills.	1,2,3
Training	Motivated to undertake KTP training modules and bespoke training as appropriate for personal and professional development.	1,3
Other	To observe the University Equal Opportunities policies at all times.	3

Desirable Criteria

Area	Criteria	Stage
Knowledge and Expertise	Knowledge of hydrogen production techniques, electrolysis and battery systems.	1,2,3
	Experience in activities related to laboratory test rigs, such as undertaking 3D printing or coding NI lab view.	1,2,3

	Ability to take part in collaborative activities and work with technical staff and employees across different disciplines at all organisational levels.	1,3
	Demonstrates application of skills and expertise to solving real-world problems.	1,2,3
Skills and abilities	Proven track-record of engaging diverse stakeholders in a change programme.	1,2,3
Attributes	Self-motivated with ability to meet deadlines and achieve technical objectives at a high standard.	1,2,3

Conditions of Service

The position is FULL TIME and FIXED TERM for 24 months. Salary will be between £33,000 - £36,000 per annum, at a starting salary to be confirmed on offer of appointment. The successful applicant will also receive a £4,000 training budget over the project period.

The appointment will be subject to the University's normal Terms and Conditions of Employment for Academic and Related staff/Operational and Administrative staff, details of which can be found here.

We strive to create a culture that supports equality and celebrates diversity throughout the campus. The University holds a Bronze Athena SWAN award which recognises the importance of support for women at all stages of their academic career. For further information on Athena SWAN see <http://www.lboro.ac.uk/services/hr/athena-swan/>.

Informal Enquiries

Informal enquiries should be made to Academic Supervisors: Dr B Buckley (b.r.buckley@lboro.ac.uk) or Prof D Strickland (d.strickland@lboro.ac.uk).

Applications

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Interviews will be held in the week commencing **9th October 2023**.

We will also conduct a short Teams pre-screening before your official interview, to review some basic questions.