School of Aeronautical, Automotive, Chemical and Materials Engineering – Department of Chemical Engineering

Loughborough University

Research Associate in Electrochemical Carbon Dioxide Reduction

REQ210006

As part of the University's ongoing commitment to redeployment, please note that this vacancy may be withdrawn at any stage of the recruitment process if a suitable redeployee is identified.

Project Description

This project is part of a multi-institutional and multi-disciplinary national research programme focused on the efficient and sustainable production, use and recovery of chemicals, The programme involves 7 universities (Loughborough, Cardiff, Heriot-Watt, Imperial College London, Liverpool, Newcastle, and Sheffield) and >20 industrial and international partners, who will jointly develop key transformational enabling technologies, evaluate system-wide interactions with existing infrastructures and supply chains, and explore the complex non-technical barriers around business motivation, finance gaps, public awareness, and policy to support government, businesses, the third sector and consumers.

This project will be based in the Department of Chemical Engineering in the school of Aeronautical, Automotive, Chemical and Materials Engineering (AACME). Following a recent £25 million refurbishment, the department houses a range of state-of-the-art laboratory facilities and modern office environment.

We are committed to achieving equality for all those who learn and work here and providing a diverse and inclusive working environment. We will consider reasonable adjustments commensurate with the project requirements.

Full project details

This project is a part of the national research programme with the aim to develop highly efficient electrochemical and bioelectrochemical system able to convert waste CO2 from industrial process to multi-carbon products as chemical feedstocks as alternative raw materials for fuels and chemical production using renewable energies. We are seeking to a talented and enthusiastic Research Associate/Assistant with experience of research in catalyst development, reactor design and process optimisation for Electrochemical reduction of CO2.

Job Description

Job Grade: Specialist and Supporting Academic Grade 6

Job Purpose:

The Postdoctoral Research Associate will work as part of the wider Centre to develop highly efficient electrochemical CO2 reduction process for the synthesis of chemical precursors from CO2 and wastes biomass resources.

Job Duties

Research

- To conduct research on catalyst development for electrochemical reduction of CO_2 to organic compounds
- To design, set up and operate electrochemical systems for cathodic CO_2 reduction to organic compounds

- To set up and operate microbial bioelectrochemical systems for cathodic electrosynthesis of organic compounds
- To investigate materials (electrode substrate, membrane and catalysts) for electrochemical systems for cathodic CO_2 reduction
- To conduct electrochemical, physical, and chemical characterisation of electrochemical systems
- To analyse and present research data
- To synthesise and interpret data
- To liaise with academic and industrial project partners, and coordinate activities across the consortium

General, technical

- To perform risk assessments, develop method statements and implement safety procedures.
- To manage technical equipment and provide training to other users as required
- To actively engage with industrial and other non-academic stakeholders to determine system requirements and identify and address potential barriers for implementation
- To regularly report research progress to the Centre through formal and informal reports and communications
- To write research papers suitable for publication in high quality academic journals and for presentation at specialist scientific conferences.
- To supervise student projects in related areas.
- To attend and contribute to project meetings and engagement events.
- To assist in the development of research proposals and grant applications for follow-on project funding.
- General lab organization and coordination

General and administrative

- To work effectively with relevant administrative, technical and academic staff in the School and across the University.
- To engage in training programmes in the University (e.g. through Staff Development) which are consistent with the needs and aspirations of the project team and those of the School.
- To maintain confidentiality at all times and ensure that intellectual property agreements are not violated.
- To assist the academic staff in the project team with the supervision of undergraduate MSc and PhD project work and day-to-day supervision and support of other researchers.
- To support Chemical Engineering teaching delivery as required
- To carry out specific other duties as may be reasonably requested by the project leaders 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.

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 Prof Eileen Yu, Department of Chemical Engineering.

Person Specification

Your application will be reviewed with respect to meeting the essential and desirable criteria listed below. 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 – Test/Assessment Centre/Presentation
3 – Interview

Essential Criteria

Area	Criteria	Stage
Experience	Recent relevant research in an academic environment	1,3
	Experience of synthesis and characterisation of catalysts	1,3
	Electrochemical analysis, catalysis, chemical-physical analysis	1,3
	Practical experience of electrochemical analysis of bio-electrochemical systems	1,3
	Experience of chemical analysis with various instruments, such as GC, HPLC, BET, DSL, FTIR, DEMS	1,3
	Record of high quality publications in respected scientific journals	1,3
	Experience of presenting research findings at all levels, adapted to specific audience needs, ranging from academic experts to general public	1,3
	Experience with relevant computer software	1,3
Skills and abilities	Ability to coordinate project activities, manage project tasks, prioritise and meet deadlines	1,3
	Ability to work independently and also as part of a team	1,3
	Ability to work across multiple fields and readily understand new and challenging concepts	1,3
	Excellent written and oral communication skills	1,3
	Excellent interpersonal, and organisational skills	1,3
	Flexibility	1,3
	Ability to network with other academics and engage with project stakeholders	1,3
	Ability to write project reports and make technical presentations to industrial and academic research groups	1,3
	Skills in finding information in the scientific literature and proposing original ideas	1,3
	Knowledge of relevant Health & Safety issues	1,3
	Ability to manage laboratory equipment, including the organisation of equipment training sessions, preparation of Standard Operating Procedures (SOP) documents, management of equipment booking calendars and equipment troubleshooting	1,3
Training	A willingness to undertake further training as appropriate and to adopt new procedures as and when required	1,3
Qualifications	Have or soon to have a PhD related to electrochemical/bioelectrochemical systems or a relevant field	1

Other	Commitment to observing the University's Equal Opportunities policy at all times.	1
	Commitment to maintain confidentiality at all times	1,3
	Willingness to travel and do medium-term visits to project partners	1,3

Desirable Criteria

Area	Criteria	Stage
Experience	Experience in supervising junior members (e.g. PhD or final year project students)	1,3
	Writing research proposals for funding from internal/external sources.	1,3
	Experience of bio- and photoelectrochemical systems	1,3
Skills and abilities	Willing to work across Schools and universities to maximize cross-disciplinary outputs	1,3
	Willingness to work collaboratively with project partners in different locations	
	Willingness to assist in preparation for meetings	

Conditions of Service

The position is **full-time** and **fixed-term** for 24 months. Salary will be on Specialist and Supporting Academic Research, Grade 6, (£30,942 - £40,322 per annum), at a starting salary to be confirmed on offer of appointment.

The appointment will be subject to the University's Terms and Conditions of Employment for Grade 6 and above staff, details of which can be found here.

The University is committed to enabling staff to maintain a healthy work-home balance and has a number of family-friendly policies which can be found here.

The University offers a wide range of employee benefits which can be found here.

We also offer an on-campus nursery with subsidised places, subsidised places at local holiday clubs and a childcare voucher scheme (further details are available at: http://www.lboro.ac.uk/services/hr/a-z/childcare-information---page.html

In addition, the University is supportive, wherever possible, of flexible working arrangements.
We also 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/