POSITION DESCRIPTION

Position Title: Postdoctoral Research Fellow
Organisation Unit: School of Chemical Engineering
Position Number: NEW
Type of Employment: Full-Time, Fixed Term for 2 years
Classification: Academic Level A

THE UNIVERSITY OF QUEENSLAND

The University of Queensland (UQ) contributes positively to society by engaging in the creation, preservation, transfer and application of knowledge. UQ helps shape the future by bringing together and developing leaders in their fields to inspire the next generation and to advance ideas that benefit the world. UQ strives for the personal and professional success of its students, staff and alumni. For more than a century, we have educated and worked with outstanding people to deliver knowledge leadership for a better world.

UQ ranks in the world’s top universities, as measured by several key independent ranking, including the Performance Ranking of Scientific Papers for World Universities (45), the US News Best Global Universities Rankings (52), QS World University Rankings (51), Academic Ranking of World Universities (55), and the Times Higher Education World University Rankings (60). UQ again topped the nation in the prestigious Nature Index; and secured a greater share of Australian Research Council grants in 2016 ($24.5 million) than any other university nationally.

UQ has an outstanding reputation for the quality of its teachers, its educational programs and employment outcomes for its students. Our students remain at the heart of what we do. The UQ experience –the UQ Advantage – is distinguished by a research enriched curriculum, international collaborations, industry engagement and opportunities that nurture and develop future leaders. UQ has a strong focus on teaching excellence, winning more national teaching excellence awards than any other in the country and attracting the majority of Queensland’s highest academic achievers, as well as top interstate and overseas students.

UQ is one of Australia’s Group of Eight, a charter member of edX and a founding member of Universitas 21, an international consortium of leading research-intensive universities.

Our 50,000-plus strong student community includes more than 13,000 postgraduate scholars and more than 12,000 international students from 144 countries, adding to its proud 230,000-plus alumni. The University has about 7,000 academic and professional staff and a $1.7 billion annual operating budget. Its major campuses are at St Lucia, Gatton and Herston, in addition to teaching and research sites around Queensland and Brisbane city. The University has six Faculties and four University-level Institutes. The Institutes, funded by government and industry grants, philanthropy and commercialisation activities, have built scale and focus in
research areas in neuroscience, biomolecular and biomedical sciences, sustainable minerals, bioengineering and nanotechnology, as well as social science research.

UQ has an outstanding track-record in commercialisation of our innovation with major technologies employed across the globe and integral to gross product sales of $11billion+ (see http://uniquest.com.au/our-track-record).

UQ has a rapidly growing record of attracting philanthropic support for its activities and will have further success in this area as an important strategic aim going forward.

Organisational Environment

The School of Chemical Engineering offers degrees in Chemical Engineering, Biological Engineering, Environmental Engineering and Metallurgical Engineering, servicing an undergraduate population of over 400 students. Each year the School provides over 100 new students with their first experience of what it takes to become an Engineering professional. It takes all of our 30 full time academic staff in the School and the energy of a strong and enthusiastic administrative team to provide the industry with graduate recruits who have the reputation of having received a well-rounded education with excellent knowledge and practical skills in their chosen field.

Engineering prides itself for its innovative teaching practices. Its project-centred learning program received the UQ Excellence in Teaching and Learning Award for the enhancement of student learning in 2003 and the Australasian Association for Engineering Education (A2E2) Award for Excellence in Curriculum Innovation in 2004.

The School's research strengths include nanomaterials and biomaterials, water and waste management, bioengineering, advanced energy systems, inorganic membranes and adsorption theory and simulation. Our academic and research staff publish widely in internationally acclaimed publications and have extensive research backgrounds. They supervise some 100 students who are presently enrolled in higher degree programs. External funding awarded for the current financial year to the School and its associated Centres exceeds $5million Postgraduate.

Information about the Faculty and the School may be accessed on the Faculty’s web site at www.chemeng.uq.edu.au.

Information for Prospective Staff

Information about life at UQ including staff benefits, relocation and UQ campuses is available at - http://www.uq.edu.au/current-staff/working-at-uq

DUTY STATEMENT

Primary Purpose of Position

A multi-skilled postdoctoral researcher is required for a two-year appointment, to work on the technology development to electrochemically convert carbon dioxide emitted from steel making processes into useful products such formic acid or formate. The candidate will work with the research team and industrial partners plan and execute the industrial project, which include electrode materials synthesis, electrode development, reactors design and build-up, process optimisation, and scale-up the CO₂ electrochemical reduction technology for industry.

The successful candidate is expected to show creativity, teamwork, independence, self-motivation, leadership, and project management skills to ensure the deliveries of project objectives. Experience in R&D projects and research in electrochemical engineering or
electrode material development is desirable. This project involve new technology development, which a combination of science and engineering, not necessarily exactly matching the education background of the candidate; it is expected that they will quickly learn it.

Duties

Duties and responsibilities include, but are not limited to:

**Research**

- Design, set up and develop reactors for CO₂ electrochemical reduction.
- Conduct research on novel material design, synthesis and development as cathode materials for CO₂ electrochemical reduction applications, and evaluate the cathode performance through electrochemical characterisations and chemical analysis.
- Optimise the electrode structures using chemistry or engineering method to further improve the electrode performance, stability and tolerance to impurities.
- Collaborate with a multi-disciplinary team to plan and carry out innovative R&D projects to develop the CO₂ utilisation technologies.
- Quantitative and qualitative analysis of research results from experiments or models
- Integrate the work from PhD students into the scale-up of the CO₂ electrochemical reduction system, and demonstrate the work to the key stakeholders.
- Write and edit scientific reports and publish high quality reports to stakeholders and publish high quality papers in internationally-influential journals.
- Build connections with industrial partners and sponsors and academic people with expertise in the same area.
- Identify IP arising from research and facilitate its protection through established university procedures.
- Conduct techno-economic studies as part of strategies to integrate CO₂ conversion unit into a steel-making plant.

**Teaching and Learning**

- Involvement in supervision of research students at undergraduate, masters and PhDs

**Engagement**

- Foster relations with industry, government departments, professional bodies and the wide community

**Administration**

- Work with Project Leader and Centre Manager in day-to-day management of the projects and reporting requirements.
- Contribute, as required, to the processes that enable staff to management research projects and meet project targets.

**Other**

Ensure you are aware of and comply with legislation and university policy relevant to the duties undertaken, including but not exclusive to:

- the University’s Code of Conduct.
- requirements of the Queensland occupational health and safety (OH&S) legislation and related OH&S responsibilities and procedures developed by the University or Institute/School.
- the adoption sustainable practices in all work activities and compliance with associated legislation and related University sustainability responsibilities and procedures.
- requirements of the Education Services for Overseas Students Act 2000, the National Code 2007 and associated legislation, and related responsibilities and procedures developed by the University.

Organisation Relationships
The position reports to Professor Geoff Wang, School of Chemical Engineering.

SELECTION CRITERIA

**Essential**

- PhD in the area of electrochemical engineering or other disciplines with research and publications in the area of electro-material development for electrochemical conversion such as fuel cells or electrolyzers.
- Demonstrated solid knowledge and experience in chemical engineering, electrochemistry, material science and engineering.
- Knowledge and skills in laboratory experimental design, equipment setup and maintenance of laboratory facilities and instruments (electrochemical work stations).
- Demonstrated experience in getting involved in R&D projects for industries in a university or corporate environment.
- Ability to actively participate in discussion, presentation and debate in English and to write detailed reports and journal papers efficiently and succinctly.
- Ability to work both independently and collaboratively within a multi-disciplinary team, while taking the lead role for specific projects.
- Keep a good record of scientific publications in high-impact journals.
- Be resourceful and creative in solving challenging problems in research.
- High level of interpersonal skills and good presentation skills.

**Desirable**

- Experience in tutoring and supervising students (undergraduates, masters or PhD).
- Previous experience in scaling up technologies related to electrochemical conversion.
- Previous experience in involving in R&D projects in a corporate environment.
- Previous experience in proof-of-concept demonstration to industrial sponsors and potential investors.
- Ability to start immediately is highly desired.

**Qualification Verification**

An appointment to this position is subject to the verification of the highest academic qualification from the conferring institution.

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The University of Queensland values diversity and inclusion.