POSITION DESCRIPTION

THE UNIVERSITY OF MELBOURNE

School of Chemical and Biomedical Engineering
Faculty of Engineering and Information Technology

Postdoctoral Research Fellow - Carbelec Project (Fluid Dynamic Modelling)

POSITION NO	0054946
CLASSIFICATION	Level A or Level B (commensurate with experience)
SALARY	Level A: $75,289 - $102,163 p.a. ($95,179 for PhD entry level) Level B: $107,547 - $127,707 p.a.
SUPERANNUATION	Employer contribution of 17%
WORKING HOURS	Full-time
BASIS OF EMPLOYMENT	Fixed term position available for 24 months Applications for part-time or other flexible working arrangements will be welcomed and will be fully considered subject to meeting the inherent requirements of the position
OTHER BENEFITS	https://about.unimelb.edu.au/careers/staff-benefits
HOW TO APPLY	Online applications are preferred. Go to http://about.unimelb.edu.au/careers, select the relevant option ('Current Opportunities' or 'Jobs available to current staff'), then find the position by title or number. Limit "address to ESSENTIAL selection criteria" to 3 pages.
CONTACT FOR ENQUIRIES ONLY	For further details on this position, please contact Professor Robin Batterham (Chemical Engineering) email r.batterham@unimelb.edu.au Associate Professor Dalton Harvie (Chemical Engineering) email daltonh@unimelb.edu.au *Please do not send your application to this contact*

For information about working for the University of Melbourne, visit our website:
about.unimelb.edu.au/careers

Acknowledgement of Country

The University of Melbourne acknowledges the Traditional Owners of country throughout Australia. The University recognises the unique place held by Aboriginal and Torres Strait Islander peoples as the original custodians of country and their continued connection to the land, waterways, songlines and culture. The University respects all Aboriginal and Torres Strait Islander People and warmly embrace those students, staff, Elders and collaborators who identify as First Nations.

FEIT's Commitment to Diversity and Inclusion

The Faculty of Engineering and Information Technology (FEIT) is committed to creating a diverse and inclusive environment that welcomes and values all people. We recognise that diversity is essential in contributing to the success of FEIT. Women, Aboriginal and Torres Strait Islanders, the LGBTIQ+ community, people living with disability and those from a culturally and linguistically diverse background, are strongly encouraged to apply. Those seeking support in submitting an application are welcome to contact the Faculty HR team at feit-hr@unimelb.edu.au

Position Summary

Carbelec is a technology aimed at removing CO_2 from industrial gas streams and is being jointly developed by Hancock Prospecting Pty Ltd and the University of Melbourne. It is a revolutionary technology that involves the electrolytic decomposition of CO_2 into Carbon (solid) and O_2 at low temperatures. Carbelec has the potential for step change improvements across multiple industries, including carbon emission reductions in steel production, as well as other industrial sectors such as cement and potentially direct air capture.

The Postdoctoral Research Fellow will tackle some of the challenges with low temperature direct electrolysis, especially understanding and optimising the detachment of the newly formed carbon from the electrode and the subsequent separation of the product from the electrolyte. The researcher will fundamentally challenge this via a combination of techniques, including small scale experiments, physical modelling and where necessary, Computational Fluid Dynamics (CFD) simulations.

The Postdoctoral Research Fellow will be primarily responsible for the small-scale physical modelling and CFD aspects of the project, working within a larger dynamic team that is being rapidly assembled to optimise this ground-breaking Carbelec technology. As this problem involves multiple physical effects (fluid and suspension flow, chemical reactions, fluid interface dynamics and chemistry, electrolysis and electrohydrodynamics) the researcher will use a variety of modelling and simulation techniques to aid/create understanding of this industrially-focused fluid-based system.

1. Selection Criteria

1.1 ESSENTIAL

- A postgraduate research degree at PhD level (or near completion) or Higher Education qualification in a field relevant to the position described above. Specifically you will have core experience in modelling or performing detailed analysis on fluid flow, or physical effects that occur within flowing fluids.
- A record of high-quality research as evidenced by publications in leading journals and at conferences commensurate with opportunity.
- Ability to perform independent research with a commitment to interdisciplinary research.
- Demonstrated ability to lead and contribute in a cross-functional, multi-disciplinary team environment.
- Detail oriented, self-motivated and committed to the profession.
- Experience in working with minimal supervision and ability to prioritise tasks to achieve project objectives within timelines, demonstrating flexibility to flourish in a fast-paced environment.
- Demonstrated capacity to communicate research concepts to technical and non-technical audiences.
- Excellent written and verbal communication skills, demonstrated by presentation of research results at conferences, internal forums and manuscript submissions.
- Excellent interpersonal skills, including an ability to interact with internal and external stakeholders (academic, administrative and support staff) in a courteous and effective manner.

- Demonstrated ability to develop, administer and see through to completion. appropriately designed research projects with limited supervision.

1.2 ADDITIONAL ESSENTIAL CRITERIA FOR APPOINTMENT AT LEVEL B

At Research Fellow Level B, the successful applicant must demonstrate all of the above, and additionally must demonstrate:

- An outstanding background in either of the project areas.
- Demonstrated ability to perform independent research and a commitment to interdisciplinary research.
- Demonstrated ability to develop new experimental protocols and experience in trouble shooting protocols.
- Demonstrated ability to work with limited supervision in a self-directed manner and as a member of a research team, and to interact in a courteous and effective manner with academic, administrative and support staff.

1.3 DESIRABLE

- Experience in using one or more Computational Fluid Dynamics or Multiphysics software packages.
- Experience in constructing small scale physical models of fluid flow or particle/droplet movement/formation/detachment.
- Experience in using coding/programming to model or analyse multiphysics problems.
- Experience in modelling any of: particle in fluid dynamics, suspension flows, settling and separation, interfacial forces, interfacial chemistry, interfacial dynamics, reacting flows, electrolysis, electrohydrodynamics.

1.4 OTHER JOB-RELATED INFORMATION

- This position requires the incumbent to hold a current and valid Working with Children Check.
- Occasional work out of ordinary hours, travel, etc.

2. Key Responsibilities

The position description should be read alongside the Academic Career Benchmarks.

A level A academic is acquiring skills and building academic achievements (oriented towards the benchmarks).

2.1 RESEARCH AND RESEARCH TRAINING

- You are expected to significantly contribute towards the research effort of the team and to develop your research expertise with an increasing degree of autonomy.
- Under the guidance and support of Senior Academic staff conduct internationally competitive research, resulting in publications in high impact journals.
- Contribute to timely reports to the project steering committee.

- Contribute to and publish academic papers and other scholarly outputs to a high academic standard in accordance with the research expectations of the University of Melbourne.
- Actively participate in research seminars and conferences to disseminate research findings as opportunities arise.
- Undertake administrative functions and obligations primarily connected with the staff member's area of research.
- Contribute to, and assist in the co-supervision and training of research students primarily at undergraduate level.

2.2 TEACHING AND LEARNING

- Contribute to teaching, training, scientific mentoring and supervision of students.
- Contribute to the effective supervision of junior research staff in the appointee's area of expertise.

2.3 LEADERSHIP AND SERVICE

- Actively participate at School meetings and with guidance, contribute to planning activities or committee work to support capacity building in the School/discipline.
- Contribute to, or present research to the public to elevate public awareness of educational and scientific developments, and promote critical enquiry and public debate within the community where appropriate.
- Effective demonstration and promotion of University values including diversity and inclusion and high standards of ethics and integrity.
- Actively contribute to School activities such as Open day to promote student engagement.

2.4 OTHER DUTIES

- Perform other tasks as requested by the supervisor or the Head of School
- Actively participate in the University Professional Development Framework
- Ensure an up-to-date record of University compliance courses, such as, but not limited to, Appropriate Workplace Behaviour, PDF for Staff and Supervisors, OH &S training courses.
- Occupational Health and Safety (OH&S) and Environmental Health and Safety (EH&S) responsibilities as outlined in section 4.

IN ADDITION TO THE ABOVE, EXPECTATIONS OF A LEVEL B ACADEMIC POSITION ARE:

- Contribute to promotion and maintenance of academic excellence by supporting activities such as the School seminar series.
- Initiate, manage and maintain significant inter-School and institutional collaborations.
- Plan experimental programs for Research Fellows, students and Research Assistants and effectively supervise or co-supervise honours or postgraduate research projects within research area.

3. Equal Opportunity, Diversity and Inclusion

The University is committed to all aspects of equal opportunity, diversity and inclusion in the workplace and to providing all staff, students, contractors, honorary appointees, volunteers and visitors with a safe, respectful and rewarding environment free from all forms of unlawful discrimination, harassment, vilification and victimisation. This commitment is set out in the University's People Strategy and policies that address diversity and inclusion, equal employment opportunity, discrimination, sexual harassment, bullying and appropriate workplace behaviour. All staff are required to comply with all University policies.

All FEIT employees are required to behave in a manner that creates; supports and encourages an inclusive and safe work environment for all.

https://eng.unimelb.edu.au/diversity

4. Occupational Health and Safety (OHS)

All staff are required to take reasonable care for their own health and safety and that of other personnel who may be affected by their conduct.

OHS responsibilities applicable to positions are published at:

http://safety.unimelb.edu.au/topics/responsibilities/

These include general staff responsibilities and those additional responsibilities that apply for Managers and Supervisors and other Personnel.

5. Other Information

5.1 SCHOOL OF CHEMICAL AND BIOMEDICAL ENGINEERING

https://eng.unimelb.edu.au/about/departments/school-of-chemical-and-biomedical-engineering

The School of Chemical and Biomedical Engineering encompasses both the Department of Chemical Engineering and the Department of Biomedical Engineering. This fusion of engineering disciplines provides a dynamic and interdisciplinary environment that is world leading in both research and teaching.

5.2 DEPARTMENT OF CHEMICAL ENGINEERING

http://www.chemeng.unimelb.edu.au

The Department of Chemical Engineering hosts several Research Centres including the Peter Cook Centre for Carbon Capture and Research, the ARC Dairy Innovation Research Hub, the Particulate Fluids Processing Centre and the ARC Centre of Excellence in Convergent Bio-Nano Science and Technology.

Our laboratories are housed across four locations including a substantially renovated main building, a second building devoted exclusively to research, two floors within the nearby Chemistry building and a presence within the Bio21 Institute. Our academics have been elected as Fellows of the Royal Society, the world's oldest scientific society, the Australian Academy of Science, and the Australian Academy of Technological Sciences and Engineering.

Strong collaborations with industry, government and community partners inform teaching and research programs with real-world requirements. Industry Engagement is a key focus area for the Department. We carry out research projects based on deep collaborations with government and business and we also work with organisations that provide internship project opportunities for students.

We offer four Masters of Engineering degrees (Chemical, Chemical with Business, Biochemical, and Materials) with over 250 students, as well as undergraduate majors within the Bachelor of Science and Bachelor of Commerce.

5.3 SCHOOL OF CHEMICAL AND BIOMEDICAL ENGINEERING

https://eng.unimelb.edu.au/about/departments/school-of-chemical-and-biomedical-engineering

The School of CBE integrates the expertise and capabilities of the Chemical Engineering and Biomedical Engineering departments. The resulting mix of skills creates new horizons for engineering and enables the realisation of transformative new ideas into practical innovations.

This ranges from the development of bionic prosthetic implants to remediation of Antarctic landscapes. The sweep of technological applications is vast and we are focused on end-use inspired research.

We encompass mining, energy, material science, the environment, medical devices, medical imaging, drug delivery and food production. Our goal is to facilitate knowledge acquisition, research excellence, and its translation into technological, societal, industrial and medical innovation.

5.4 FACULTY OF ENGINEERING AND INFORMATION TECHNOLOGY

The Faculty of Engineering and Information Technology (FEIT) has been the leading Australian provider of engineering and IT education and research for over 150 years. We are a multidisciplinary School organised into three key areas; Computing and Information Systems (CIS), Chemical and Biomedical Engineering (CBE) and Electrical, Mechanical and Infrastructure Engineering (EMI). FEIT continues to attract top staff and students with a global reputation and has a commitment to knowledge for the betterment of society.

FEIT has never been better positioned as a global leader, anchored in the dynamic Asia Pacific region, creating and curating knowledge to address some of the world's biggest challenges. Through our students and our relationships with communities, we can not only respond to society's needs but anticipate and create engineering and IT solutions for the future.

https://eng.unimelb.edu.au/

https://eng.unimelb.edu.au/about/join-feit

Our ten-year strategy, FEIT 2025, is our School's commitment to bring to life the University-wide strategy Advancing Melbourne and reinforce the University of Melbourne's position as one of the best in the world.

To achieve our ambitions, we will continue to build new infrastructure to enable our teaching, research and engagement; we continue to recruit outstanding people from around the world; and we continue to attract high-quality students from across the globe who are at the heart of our enterprise.

https://eng.unimelb.edu.au/about/feit-2025

5.5 THE UNIVERSITY OF MELBOURNE

Established in 1853, the University of Melbourne is a public-spirited institution that makes distinctive contributions to society in research, learning and teaching and engagement. It's consistently ranked among the leading universities in the world, with international rankings of world universities placing it as number 1 in Australia and number 32 in the world (Times Higher Education World University Rankings 2017-2018).

The University's 10-year strategy, Advancing Melbourne will enable the University to contribute to advancing the state and national interest and make vital contributions to Australia's standing on the world stage. We seek to be a leading force in advancing Australia as an ambitious, forward-thinking country while increasing its reputation and influence globally. https://about.unimelb.edu.au/strategy/advancing-melbourne

Further information about working at The University of Melbourne is available at http://about.unimelb.edu.au/careers

5.6 HANCOCK PROSPECTING PTY LTD (HPPL)

Built on a long and special history of investing and risk taking in Australia, Hancock Prospecting Pty Ltd (HPPL) is an independent, privately owned Australian company that has a proud history with the Pilbara and the iron ore sector, and is one of the longest continuous owners of cattle stations in Australia. Under the leadership of the Executive Chairman, Gina Rinehart, HPPL (including its majority ownership in Roy Hill) has grown into one of the most successful private companies in Australia's history, and is a diversified company group with interests in iron ore, coal, beef, dairy as well as continuing mineral exploration and development.