

**Fully Funded PhD Position:
Scanning Electrochemical Microscopy of Electrocatalysts for the Oxygen Evolution Reaction in Anion Exchange Membrane Electrolysers**

Supervisor: Dr Kim McKelvey

Location: School of Chemical and Physical Sciences, Victoria University of Wellington, Wellington, New Zealand.

Funding: NZD\$30,000 per annum (not taxed), plus all student fees for three (3) years.

Background:

A PhD position as part of a New Zealand-German Green Hydrogen program: **Design, Synthesis and Advanced Characterisation of Electrocatalysts for the Oxygen Evolution Reaction in Anion Exchange Membrane Electrolysers**. This programme aims to develop above state-of-the-art anode materials for the anion exchange membrane electrolyser (AEMEL) technology using low-cost and abundant materials. Currently, the anode overpotential makes up the majority part of the inefficiencies of an AEMEL system. By developing more efficient anode materials, a significant increase in the efficiency of hydrogen production using AEMEL technology is possible. This in turn will help accelerate the formation of a green hydrogen economy and thus support the Governmental climate change goals in Germany and New Zealand.

Project:

This project will involve using nanoscale electrochemical methods that have been pioneered by Dr McKelvey to study the electrocatalytic activity of a range of novel electrocatalysts for the oxygen evolution reaction. We will aim to use Scanning Electrochemical Cell Microscopy to map the electrocatalytic response at electrocatalyst surfaces with 100 nm resolution. This will reveal how the nanostructure of the electrode surfaces influences the oxygen evolution reaction and, in turn, will allow us to design better materials. A range of other materials characterisation techniques, such as atomic force microscopy, electron microscopy, Raman spectroscopy and electrochemical impedance spectroscopy will also be used in the project, as well as finite element simulations. No prior knowledge of these technique is assumed, and full training will be given in all aspects of the project.

Research environment: You will work in a supportive research group (<http://www.mckelveylab.com/>) in the School of Chemical and Physical Sciences (SCPS) at Victoria University of Wellington (VUW). SCPS and VUW has a vibrant research community with world class research facilities. We are located inf Wellington, one of the most liveable cities in the world, culinary capital of New Zealand, and with nature on our doorstep.

You will be part of the MacDiarmid Institute for Advanced Materials and Nanotechnology (<https://www.macdiarmid.ac.nz/>), a Centre of Research Excellence specialising in materials science and nanotechnology. The project is part of the New Zealand-German green hydrogen program. You will collaborate with researchers in Germany at Fraunhofer IFAM and University Bayreuth, and in New Zealand at the University of Canterbury and the University of Auckland.

Requirements: Applicants should have a background in Chemistry, Chemical Engineering, Physics, or a related subject. Some experience, skill and interest in electrochemistry or electrochemical engineering would be beneficial but is not essential. Ability to write reports, keep to deadlines, and work well in a team. A wide range of skills will be developed during this project, and full training will be given in all aspects of the project. Candidates will need to satisfy the requirements for admission as a PhD candidate at Victoria University of Wellington (<https://www.wgtn.ac.nz/fgr/apply/how/entry-requirements>)

More information: Please email kim.mckelvey@vuw.ac.nz

Application: To apply please email a cover letter and CV to kim.mckelvey@vuw.ac.nz. Applications will be considered from the 15th March 2022.

