

# School of Chemical Engineering

The School of Chemical Engineering at the University of Adelaide is the second oldest in Australia and has graduated more than 1000 undergraduates and hundreds of postgraduates since its founding in 1947 following the appointment of Dr E.C.R. Spooner to the University Chair in Mining and Metallurgy. Today the School offers a range of undergraduate degrees fully accredited by Engineers Australia and the IChemE in addition to higher degrees by course work and research, including the PhD.

The School has a vibrant and dynamic research team that undertakes cutting-edge research of both fundamental and applied natures in three main areas: Nano & Materials Engineering, Bio & Pharmaceutical Engineering, and Clean & Sustainable Engineering. The staff of the school are members of the Bio & Nanoengineering Faculty Research Group, and the University Centre for Energy Technology. Research is undertaken with state-of-the-art facilities and involves collaboration with industry and academic colleagues both nationally and internationally.

[www.chemeng.adelaide.edu.au](http://www.chemeng.adelaide.edu.au)



LIN LIN LOW

PhD 2007

Studying for my PhD at the University of Adelaide was one of the best things I have done. The University and the School of Chemical Engineering provided all the support that I needed for my personal and professional development. The friendly environment, ability to access all the facilities I required and the flexibility to spend time in industry certainly made my PhD journey a memorable one.

Dr Low's thesis was entitled *Evaluation of Tartrate Stabilisation Technologies for the Wine Industry*. She now works for Constellation Wines in Berri, South Australia, as their Environmental Coordinator.

## Research Opportunities

There are a host of opportunities to undertake research in the School of Chemical Engineering at The University of Adelaide as:

- a Ph.D., M.Phil. or M.Eng. student;
- a visiting academic from another institution; or
- a visiting final year student from another institution.

In addition to the excellent research facilities outlined in this brochure, you will have access to a computer, library and study space.

In some cases the School will be able to assist in covering some or all of your costs as a visitor. For those who are interested in undertaking a higher degree in the School, please also consult the scholarships webpage of The University of Adelaide [www.adelaide.edu.au/graduatecentre/scholarships/postgrad/](http://www.adelaide.edu.au/graduatecentre/scholarships/postgrad/)

Whilst ad hoc scholarships are available all year round, the deadlines of the major scholarship rounds of the University occur in August, October and May of each year.

Please contact us if you think you would like to undertake research in the School in collaboration with our staff. You may do this by contacting any of the staff directly (see inside) or the postgraduate studies coordinator ([pgstudies@chemeng.adelaide.edu.au](mailto:pgstudies@chemeng.adelaide.edu.au)).

For more information:

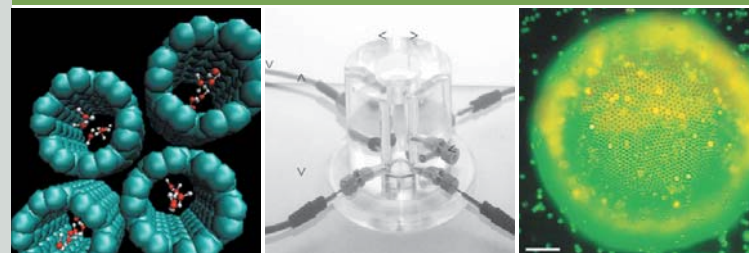
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## Chemical Engineering Research Profile and Opportunities

Be part of a World-leading University



## The University of Adelaide

The University of Adelaide, founded in 1874, is the third oldest University in Australia and older than all but a handful of UK universities.



It is one of Australia's leading universities with a proud academic tradition exemplified by the five Nobel Laureates – Sir William and Sir Lawrence Bragg (1915), Lord Florey (1945), J.M. Coetzee (2003) and Dr J. Robin Warren (2005) – that are associated with Adelaide as well as the over 100 Rhodes Scholars that may be counted amongst its graduates.



Adelaide's research is at the leading edge of knowledge, with research earnings consistently the highest per capita of any university in Australia. The research outputs of the University are independently ranked in the top 1% in the world in no less than 13 major fields. It is also often to be found in the top 100 universities in the world in various international league tables.

We are committed to producing graduates recognised worldwide for their creativity, knowledge and skills, as well as their culture and tolerance. Our graduates make an impact on the world. Life impact. Why not come and join us.



Life Impact | The University of Adelaide

# Facilities

The School of Chemical Engineering hosts state-of-the-art facilities that span its areas of research strength including:

- **Advanced Bioprocess and Pharmaceutical Engineering Laboratory** rated at PC-2 level that includes various bioreactors and fermenters, autoclaves, homogenizer, centrifuges, chromatographs, membrane separations, optical microscopy, and various freezers and refrigerators.
- **Advanced Water Laboratory** rated at PC-2 level that includes bioreactors, fermenters, PCR, electrophoresis, HPLC, GC, UV spectrometer, COD analysis and optical microscopy facilities.
- **Advanced Microalgal Engineering Research Laboratory** that includes indoor and outdoor biomass culturing facilities at various scales and downstream processing technologies suitable for the purposes of study and development of novel algal products, environmental management strategies for nuisance algal growth, and algal-based water and wastewater recycling.
- **Advanced Analytical Laboratory** that includes calorimetry, gas chromatography, particle size and zeta potential analysis, supercritical fluid extraction, gas chemical analysis, TGA/DSC, FTIR, HPLC, optical microscopy, furnace, and atomic absorption & UV/Vis spectrometry.
- **Advanced Laser Laboratory** that includes various (UV to visible) tuneable dye laser systems, mid-IR tuneable laser system, various (Ar+, CO<sub>2</sub>, solid state) continuous wave lasers, various intensified CCD imaging systems, IR detectors, PMTs, intensity correlators, and PIV systems.
- **Advanced Rheology Laboratory** that includes various commercial and in-house constructed rheometers and viscometers, including systems that can operate at non-atmospheric temperatures and pressures.
- **The South Australian Coal Research Laboratory** that includes laboratory and pilot-scale fluidised bed reactors that may be operated in combustion, gasification or pyrolysis mode using a range of solid fuels, and ancillary equipment for solids handling, feed preparation and gas analysis.

It also has access to state-of-the-art University, State and National facilities, including:

- The various supercomputing facilities hosted by eResearchSA ([www.eresearchsa.edu.au](http://www.eresearchsa.edu.au)) and the National Computational Infrastructure (NCI) National Facility hosted by the ANU ([nf.nci.org.au](http://nf.nci.org.au)).
- The many advanced analytical and microfabrication facilities hosted by the Australian Microscopy & Microanalysis Research Facility (AMMRF) in Adelaide and elsewhere in Australia ([www.ammrf.org.au](http://www.ammrf.org.au)).
- The many advanced biosciences related facilities hosted by the Adelaide Integrated Bioscience (AIB) Laboratories ([www.bioinnovationsa.com.au/AIBLabs.htm](http://www.bioinnovationsa.com.au/AIBLabs.htm))



## STAFF RESEARCH EXPERTISE



### Dr. Zeyad Alwhabi

BSc (Al Mustansiriyah), PhD (Sussex)

Laser diagnostics in fluid mechanics, combustion, laser spectroscopy and molecular reaction dynamics. Transport processes.



### A/Prof. Peter Ashman

BE (Syd), ME (Syd), PhD (Syd), GCEd (HE), CEng, FAIE, FIChemE

Production of clean, efficient and sustainable energy, including biomass and waste fuels, clean coal, geothermal energy and second generation biofuels



### Dr. Jingxiu Bi

BE (China), ME (CAS), PhD (CAS)

Self-assembly of virus like particle vaccines. High-throughput bioprocessing of viral structural proteins and their subsequent controlled assembly.



### Prof. Mark Biggs

BEHons I (UNSW), PhD (Adelaide)

Fundamentals of interfacial phenomena and their exploitation for nanoporous materials, proteins at interfaces, biomimetic self-assembly & multiphase fluids.



### Dr. Sheng Dai

BSc (Zhejiang), ME (NTU), PhD (NTU)

Fundamentals and applications of polymers, surfactants, nanomaterials, biomaterials and interfacial engineering.



### Dr. Kenneth Davey

BE (RMIT), MEngSc (Melb), PhD (Melb), CEng, FIChemE, FIEAust

Synthesis, validation and application of models of foods and pharmaceuticals processing. Quantitative risk assessments of process failure.



### A/Prof. Bo Jin

BEng (Ningxia), MSc (Delft), PhD (UNE)

Biotechnological and chemical process for water reclamation and renewable energy production, nano/porous material technology, and water treatment and quality.



### Prof. Keith King

ASTC, BSc (UNSW), PhD (NSW), FIChemE, FRACI, MRSC

Fundamentals and applications of kinetics, reactors, energy transfer, catalysis and laser diagnostics in energy, combustion and microalgal systems.



### Dr. Philip Kwong

BE (HKU), MPhil (HKUST), PhD (HKUST)

Catalytic oxidation. Fly ash recycling for environmental applications. Biomass combustion. Indoor air quality and building energy management.



### Dr. David Lewis

BE Hons (Adelaide), PhD (Adelaide), CEng, FIChemE

Environmental management and commercial exploitation of microalgae. Development of sustainable technologies for water and wastewater treatment and reuse.



### Dr. Yung Ngothai

BE (RMIT), PhD (RMIT)

Mineral deposition and dissolution under hydrothermal conditions. Design, synthesis and modification of biomaterials and recycled plastics composites.



### A/Prof. Dzuy Nugyen

BE Hons (Monash), PhD (Monash), CPEng, FIChemE, MIEAust

Rheology and fluid mechanics of structured fluids. Multiphase flows. Transport phenomena in nanofluids. Nanostructured materials. Microfluidics. High-temperature processes.



### A/Prof. Brian O'Neill

BE Hons I (Qld), PhD (Qld), CEng, FIChemE, FIEAust

Fundamental & experimental studies of rock dissolution and fouling in geothermal systems. Sustainable wine processing. Biofuels & bioprocessing. Process modelling & control.



### Dr. Hu Zhang

BE (Dalian), ME (CAS), PhD (UCL), MChemE, MISPE, MSCI

Primary cell bioprocessing, tissue engineering, bioreactor design and downstream processing. Computational fluid dynamics and mathematical modeling.

All staff may be contacted via email using an address of the form: [firstname.lastname@adelaide.edu.au](mailto:firstname.lastname@adelaide.edu.au) (eg, [mark.biggs@adelaide.edu.au](mailto:mark.biggs@adelaide.edu.au))