Our research strengths are:

- Macromolecular and interfacial engineering
- Advanced products and processes
- Energy
- Food, health and medical science and technology
- Environmental technology
The School of Chemical Engineering at UNSW Sydney is a powerhouse of innovative engineering research. We provide innovative solutions to technically complex challenges in the production, processing and management of energy, food, health and water resources. We value and encourage industry collaboration and see it as a key-contributing factor to the School’s strength.

Head of School Welcome

As a foundation school of UNSW Sydney, the School of Chemical Engineering has a long and proud history. This includes innovation and global impact spanning membrane technology, catalysis, vanadium batteries, polymers and nanomaterials. Our researchers are world class and many of our graduates have emerged to become technology entrepreneurs or leaders of global companies.

This publication provides a snapshot of our current research expertise as it evolves towards addressing the global challenges facing society today. It also highlights some of the existing collaborations we have with our partners from industry.

We place enormous importance on the transfer of our research into practice and each year our academics and research centres work with dozens of businesses, government and community organisations on specific industry related projects. Some examples of our industry partnerships can be found on pages 18-29.

Working with our partners in industry helps drive the application and impact of our research and supports the relevance of our learning and teaching programs across industry.

More detailed information about our research expertise and academic staff can be found on the School’s website che.unsw.edu.au, where you can also subscribe to the School’s newsletter.

We welcome all enquiries about engagement and partnership opportunities and I invite you to connect with us to explore further ways of linking our remarkable researchers and facilities with your needs and ambitions.

Professor Vicki Chen
Head of School
Chemical Engineering
UNSW Sydney
Our Research: At the forefront of global challenges

The School of Chemical Engineering is truly an interdisciplinary research ecosystem with four major research clusters tied together with underlying enabling platforms in product and process engineering.

Our research spans from material discovery to device design to engineering manufacturing and plant operation at scale. Many of our researchers work across multiple fields, leveraging their expertise in wide ranging collaborations locally and internationally.
Macromolecular and interfacial engineering

Our expertise in macromolecular and interfacial engineering primarily involves soft matter such as polymers, colloids and surfactants. We are interested in the design of advanced macromolecular systems tuned to provide engineered solutions specific to novel health, energy and environmental technologies.

In particular, we are developing new polymerisation techniques using less energy and greener precursors while controlling architectures and functionalities at the molecular level to deliver therapeutic agents with unprecedented precision. We are also on the cutting-edge of understanding complex fluids and their unusual physical behaviours leading to the assembly of polymers, colloids and surfactants into “smart” fluids to mimic biological fluids or enable enhanced oil recovery.

Academic Leads
Dr Nicholas Bedford, Professor Cyrille Boyer, Dr Rona Chandrawati, Dr Seeresha Das, Dr Frank Lucien, Associate Professor Patrick Spicer, Dr Peter Wight, Professor Per Zetterlund

Sustainable and biodegradable polymers
We develop unique polymerisation techniques based on the use of visible light as the sole energy source driving the synthesis of macromolecules with well-defined architectures and functionalities. Our expertise also lies in the precise design of these polymers for bio-applications and energy applications.

Smart coatings for lubrication and adhesion
Lubrication and adhesion are both important for industry and in biological systems. We are learning how molecular layers of soft matter behave in confined spaces. By understanding the molecular basis of human joint lubrication, we are designing better lubricants and adhesive systems for moving parts in microtechnology and plant machinery.

Advanced functionalised polymeric materials
The overall focus of our research is synthesis of polymeric materials and nano-objects for the design of advanced materials for applications ranging from coatings to nanomedicine. Our expertise lies in the advancement and understanding of methods for synthesis of polymers of well-defined molecular structure, specific size, shape and morphology such as hollow polymeric nanoparticles for drug delivery.

Engineering “Smart” fluids
Design of novel complex fluids with unique flow properties that mimic biological materials but can be formulated with readily-available chemicals. Our expertise is in rheological characterisation of structured fluids, prediction of their stability and performance, and product design for biomedical, consumer, and food applications.
A key aim of UNSW Chemical Engineering is to implement advanced technologies leading to improved, safer and more efficient processes to benefit the global community while lessening environmental impact. Building on our core expertise, we are developing advanced products and processes across water treatment, renewable energy, food and industrial chemicals.

We are research leaders in the area of water reuse and treatment and we have developed advanced models for process control. Projects we’ve worked on range from developing intelligent instrument schemes for monitoring industrial aluminium smelting processes, to creating novel technologies to preserve and increase nutritional content in packaged and processed foods.

**Academic Leads**

**Professor Jie Bao**
**Dr Robert Driscoll**
**Dr May Lim**
**Dr Yansong Shen**
**Dr Francisco Trujillo**

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**Intelligent process control for distributed energy systems**

Owing the intermittency of renewables, their integration to the grid is problematic beyond 20% of installed capacity. We are developing advanced processes to regulate distributed energy storage systems used to minimise the imbalance of energy demand and supply from renewables. Our expertise lies in our unique integration of the nonlinear control theory with a distributed optimisation approach to reduce the pressure on the electricity transmission networks.

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**Modelling ultrasound reactors for food processing**

Ultrasound has the potential to lead to continuous food processing under mild conditions of temperature while better preserving essential nutrients. To enable the large scale implementation of these novel processes, we are developing accurate numerical models mimicking the complexity of ultrasonic processing. Our aim is to facilitate the design, optimisation and adoption of industrial scale plasma based equipment.

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**Eradicating biofilms with cold plasma**

Food borne diseases and contamination of food along production chains are common problems faced by industry. We are developing novel air plasma technology to eradicate biofilms while preserving food nutrients. Our expertise combines the physics of plasma, novel plasma reactors design, and microbiology.

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**Process Modelling and Optimisation**

Multi-scale modelling and simulations are critical for complex processes and reactors in resource and energy industries. Computational Fluid Dynamics and Discrete Element Methods are used in applications such as process metallurgy, solid fuel preparation/utilisation, water and renewable energy processes (solar/cell/biomass/hydrogen/battery).
Energy

UNSW Chemical Engineering is at the forefront of the development of clean technologies for energy harvesting, conversion, storage and use. We develop new catalytic and photocatalytic materials for the direct conversion of raw molecules, such as carbon dioxide and water, into valuable chemicals and energy feedstock including hydrogen. Engineering hydride materials enables the safe storage and use of hydrogen as a clean energy vector and develops advanced electrode materials for novel battery technologies.

Academic Leads
Associate Professor François Aguey-Zinsou
Professor Rose Amal
Dr Nicholas Bedford
Professor Vicki Chen
Professor Liming Dai – UNSW-BUCT
International Joint Laboratory
Dr Yun Hau Ng
Dr Da-Wei Wang

Harvesting sunshine to create sustainable fuels
We develop next generation hybrid photo-electro catalysts that harness solar energy to transform carbon dioxide and water into sustainable fuels. Our expertise includes designing hetero-structured catalysts to effectively harvest solar light and translating these findings into greener manufacturing processes involving hybrid photo-catalysis.

Advanced Energy storage technology
The large scale deployment of renewable energy and the shift towards electric vehicles will require the development of new battery technologies. Our expertise lies in the rational design and application of new aqueous organic electrochemistry and new 2D materials for the creation of high-performance batteries, supercapacitors and fuel cells.

Storing the ultimate clean energy carrier
Hydrogen is the ultimate clean energy carrier providing unlimited possibilities to generate energy on demand. Through nanotechnology we are aiming to develop better materials to safely store high-density hydrogen. These storage materials also find application in switchable mirrors, metal-air batteries and catalysis.

Carbon nanomaterials and functional polymers for energy
Through a combined experimental and theoretical approach, we develop low-cost and efficient carbon-based catalysts for industrially important chemical production, environmental protection, and renewable clean energy generation directly from inherently sustainable water and sunlight. Our expertise covers the synthesis, functionalization, and device fabrication of carbon nanomaterials and polymers for energy-related applications.

12 | Energy
Food, health and medical science and technology

Food and health issues are global challenges. We are committed to improving global health by developing innovative food processes that deliver advanced nutritional content and naturally occurring bioactive elements. In addition, we are dedicated to addressing issues related to food safety, accessibility and allergens.

Our approach is multidisciplinary and involves food scientists, processing technologists, engineers, microbiologists, food chemists, food rheologists and nutritionists. Our experts are engaged with industry and government agencies and are focused on delivering technologies to improve food processes, nutrition, safety and availability.

Academic Leads
Associate Professor Jayashree Arcot
Dr Rona Chandrawati
Associate Professor Julian Cox
Associate Professor Alice Lee
Dr Peter Wich
Associate Professor Jian Zhao

Micronutrient fortification of foods
One way to combat micronutrient deficiencies is to fortify cereals with multiple micronutrients. However, this can lead to synergistic or antagonistic effects. We are developing sophisticated ex-vivo and in-vivo techniques to accurately inform the development of effective fortification methods.

Tackling food allergies with molecular design and control
Food allergies are an emerging epidemic currently affecting 10% of the world’s population. We are developing a treatment based on novel immunotherapy techniques enabling improved efficacy and safety.

Improving health using Australian native plants
Australian native plants have many hidden health-promoting bioactive components. We have launched the search, extraction, identification and elucidation of bioactivities within these components with the aim of developing effective methods for their practical use and application.

Advanced Food Processing with Membrane Technology
Membrane technologies are developed for high performance separation of dairy and vegetable proteins. Novel vibrating membranes are used to fractionate soluble components in high solids concentration feeds. We are developing new enzymatic membrane reactors to simultaneously sieve substrates and recover desired components.
Growing environmental concerns about pollution, greenhouse gas emissions and access to safe water means more efficient environmental technologies are needed. Our world class researchers have global reach, working in close collaboration with partners in industry, technology manufacturers and health regulators to provide solutions for these critical problems.

Our environmental technology research has advanced expertise in membrane technologies and their applications, in water and wastewater treatment, dissolved air flotation and separation processes for the capture and conversion of carbon dioxide.

Academic Leads
Professor Vicki Chen
Associate Professor Pierre Le Clech
Associate Professor Rita Henderson
Professor Greg Leslie
Professor Mike Manefield
Professor Chuyang Tang

Advanced materials for gas and water treatment
Novel composite membrane incorporating the latest generation of nanomaterials offer new opportunities for advanced separation of gases and water. We are developing ultra thin coatings to purify water, concentrate hypersaline brines, recover valuable resources and separate gases such as carbon dioxide. 1D, 2D, and framework materials such as MOFs are used to enhance performance of polymeric membranes.

Enhancing the performance of wastewater plants and water recycling
Advanced numerical modelling techniques based on computation fluid dynamics provide industry with improved module design and more efficient operations. Development of sophisticated monitoring tools such as fluorescence spectroscopy allows early warning and process optimisation to improve water quality.

Developing guidelines for industrial practice and regulatory agencies
Our expertise is providing a platform for the development of validation guidelines for the use of membranes in wastewater recycling across Australia. The aim is to facilitate the deployment and implementation of effective technology across industry to supply safe water to the community.

Environmental biotechnology
By combining fundamental understanding of biocatalytic and microbiological systems with new processes, we can exploit biological processes to remediate pollutants and contaminants as well as produce energy. Our expertise extends to use of algae and biofuels, biogas production, and recalcitrant organic degradation.
Our industry partners include Australian and international companies spanning across energy, food and health, water and manufacturing.
Fundamental research to make paint more environmentally sound

In collaboration with Allnex Industries, a team from the Centre for Advanced Macromolecular Design (CAMD) in the School of Chemical Engineering at UNSW Sydney is well on the way to developing environmentally friendly high-performance waterborne coatings to replace the more toxic solvent-based alternatives.

"The commercial and practical importance of coatings, such as paints, in today’s society can hardly be overstated," says Professor Per Zetterlund who is the Co-Director of UNSW’s Centre for Advanced Macromolecular Design.

According to Zetterlund, coatings can either be solvent-based or waterborne, but he says that with the ongoing drive towards more environmentally friendly coatings, there is a strong need to replace traditional solvent-based coatings with entirely waterborne systems.

"Waterborne coatings are a key measure by which the coating industry is able to meet legislative and environmental requirements to reduce their emissions of anthropogenic Volatile Organic Compounds (VOCs), which have been identified as key agents in long-term health impacts," he explains.

Although the industry is facing increased regulation in an effort to improve indoor and exterior air quality, there are still hurdles to overcome because without the use of VOCs, current waterborne coatings exhibit crucial shortcomings related to film formation. This includes poor gloss, cracking, and poor moisture and chemical resistance. Moreover, extensive use of VOC additives is not only undesirable from an environmental perspective, but also compromises properties such as drying rate, hardness build-up, and in some cases chemical resistance.

In order to address these shortcomings, Zetterlund and his team joined forces with partner organisation Allnex Industries (who do a lot of work on different types of polymer resins, paints and coatings) on a project to develop clean and effective waterborne coatings.

"Current practice in industry has been to mainly rely on a trial-and-error approach, which can be time-consuming, expensive and may not lead to optimum products. This project is looking to develop a quantitative understanding of the relationship between the method of polymer particle synthesis, the morphology of composite polymer particles, and the properties of the final polymer film," continues Zetterlund.

They have made great progress as Zetterlund explains: "The biggest outcome so far is that we have developed a completely new way to characterise the internal morphology of these so-called gradient nanoparticles based on a method called XPS [X-ray photoelectron spectroscopy]. The other important thing we’ve achieved is a good understanding on a mechanistic level of how to design a process in order to obtain polymeric nanoparticles with a specific internal structure. The remaining task is to link these two with the properties of the final films."

"For Allnex Industries, working with Per Zetterlund’s group has provided a great platform for in-depth scientific discussions on complex issues related to real-life production processes. The collaboration has provided us with new methods to answer questions that we only had assumptions on before, leading to adaptions of some of them, and triggering new ideas on how to improve our products."

Dr Richard Brinkhuis
Allnex Industries

Featured expert: Professor Per Zetterlund
Per Zetterlund is the Co-Director of CAMD a world-renowned centre for polymer synthesis and characterisation. His research is concerned with the synthesis of polymer, polymeric nanoparticles, as well as hybrid polymeric materials with a variety of applications ranging from materials science to nanomedicine. An important aspect of his research is the use of environmentally friendly carbon dioxide in polymer (nanoparticle) synthesis.
Solving the hydrogen energy storage problem

Much can be said of Associate Professor François Aguey-Zinsou’s ground-breaking work on hydrogen as a source of clean energy. But one of the most fascinating projects he is currently working on is a collaboration with the US Navy on unlocking the potential of sodium borohydride to solve the hydrogen energy storage problem.

With a high chemical energy density and zero emissions when produced from renewable resources, Associate Professor François Aguey-Zinsou believes that hydrogen is set to become a major fuel of the future, and one which “bridges the gap” between intermittent renewable and rapidly depleting fossil fuels. However, key to this effort is working out a way to effectively store and release hydrogen on demand.

His team have already developed a material capable of storing hydrogen at a low storage capacity, and what he is seeking to do in this project with the US Navy is design a material with a much higher storage capacity. “I can make an analogy with computers,” explains Aguey-Zinsou who leads the team at Merlin – the Materials Energy Research Laboratory in Nanoscale at UNSW School of Chemical Engineering.

“First generation computers were only able to do simple operations, but nowadays we have computers capable of doing billions of operations at the same time. That’s the kind of “step-change” we’re working on right now with hydrogen storage.”

Specifically, his team are working on a way to control or “unlock the potential” of the properties of components called borohydrides by working at the nanoscale. Says Aguey-Zinsou: “At Merlin our approach to solving this storage problem is to engineer hydride materials’ atoms by atoms” so we can accurately tailor their properties for given applications. We think that if we can make nanoparticles of these materials then we will be able to control the way they absorb and desorb hydrogen.”

Having proved this idea in concept, Aguey-Zinsou says the next stage, and indeed the motivation for this project, is to design a practical material that can store 5-10 times the hydrogen storage capacity of their current material.

With a fruitful relationship with UNSW Engineering going back many years, the US Navy heard about the work of Aguey-Zinsou and expressed an interest in funding this fundamental research.

“The US Navy have considerable interest in hydrogen as an energy source. Their interest is not only in providing clean fuel for various applications, such as running fuel cells in autonomous engines, but because hydrogen has a high-energy density with the potential to be produced anywhere. At the moment, the only way they can access energy is by having access to petrol, which means fossil fuels.”

For Aguey-Zinsou, the most satisfying part of the project is the free reign he’s been given to develop new and exciting ideas. “The US Navy are after really profound fundamental research. For obvious reasons, they want to be at the edge of this technology, so are pushing us to come up with things that are really innovative, which is hugely enjoyable.”

Featured expert: Associate Professor François Aguey-Zinsou

François Aguey-Zinsou has a Master in Surface and Interface Sciences and a PhD in Heterogeneous Catalysis. He has worked at the University of Queensland, the GKSS Research Centre in Hamburg, Queen Mary University London, and University College London. Since joining the School of Chemical Engineering in 2009, he has received AU$3 million in grant funding, founded the Materials Energy Research Laboratory in Nanoscale (Merlin) and focused on the properties of light metals and their hydrides at the nanoscale for hydrogen storage application.
Industry partnership

Improving the health of a nation

Partnership in summary

Partner: Goodman Fielder Ltd
Type of partnership: Contract research
Funding: $300,000 in cash and in-kind support.
Collaborating since: 2015
Purpose: To demonstrate how and why the mandatory fortification of wheat flour is of critical importance to the future wellbeing of Papua New Guinea (PNG) society.
Outcomes: To increase the nutritional value of wheat flour and other products that the population consumes to combat micronutrient malnutrition.

Goodman Fielder, one of the major flour millers in Papua New Guinea (PNG), is working with nutrition and food science expert Associate Professor Jayashree Arcot from the School of Chemical Engineering to ensure public nutrition is improved through micronutrient-fortified wheat flour.

"Micronutrient malnutrition is one of the most debilitating non-communicable conditions in any population," says A/Prof Arcot, who has extensive experience in fortifying foods with micronutrients for human consumption. "It contributes to a vicious cycle of poor health and depressed productivity as seen in PNG."

The last national nutrition survey (conducted in PNG in 2005) identified an alarming 44% of children between six months and five years suffering from chronic energy deficiency and stunting; 26% suffering a vitamin A deficiency; and 48% suffering anaemia due to iron deficiency.

Carol Colyer, a UNSW alumna who works for Goodman Fielder R&D as their Regulatory and Product Guidance Senior Manager, approached A/Prof Arcot in 2015 about a joint research project. Colyer wanted to tackle micronutrient malnutrition in PNG by fortifying wheat flour with some of the essential nutrients missing from the daily diet of the population.

"According to the Food and Agriculture Organization of the United Nations, adding nutrients to a food (fortification), for the purpose of preventing or correcting a demonstrated deficiency of one or more nutrients in the population, is one of the best-recognised interventions for the prevention and control of micronutrient malnutrition," says A/Prof Arcot. "It can offer enhanced protection from a range of disabilities and diseases, and help children grow and learn. Systematic scientific studies are required to make sure the added vitamins remain stable in a tropical environment and are efficiently absorbed by the target population under different nutritional status conditions."

The project is looking to fortify selected wheat based products with eight nutrients (iron, zinc, vitamin A, lysine, thiamin, riboflavin, niacin and folic acid) and study the interactions between the added nutrients, adjusting levels of addition based on these studies. They will then launch a nutrition intervention study in school children in PNG complemented by nutrition education programs for school children and their families.

"Our collaboration with Goodman Fielder will contribute significantly to the academic body of knowledge in regard to nutritional intervention studies and the assessment of key nutritional biomarkers," A/Prof Arcot continues. "But essentially, we want to see on-the-ground results. We want to improve the health of the local population, with a particular focus on mothers, infants and children."

"When considering who to partner with in our research in PNG, my natural choice was to first look to my alma mater for support. Picking up the conversation with Jayashree Arcot, it was immediately evident that she too shared our passion and hence our partnership progressed."

Carol Colyer
Regulatory and Product Guidance Senior Manager, Goodman Fielder Ltd

Featured expert: Associate Professor Jayashree Arcot

Associate Professor Jayashree Arcot is an expert in the area of food and nutritional science and Co-Director of the ARC Training Centre for Advanced Technologies in Food Manufacture. Her research in human nutrition is based on a food-based approach to tackling micronutrient malnutrition. She is active in industry and academia, sitting on panels and speaking at conferences, and has received considerable funding for her research. She has published widely and in 2013 was awarded the Australia-India Senior Visiting Fellowship by the Australian Academy of Science.
Industry partnership

Water supplies under pressure

With algal blooms costing an estimated $200 million of damage annually, Dr Rita Henderson and her research group at the bioMASS Lab in the School of Chemical Engineering assist their partners in the water industry by developing novel treatment and monitoring methods to assist in the management of impacted water supplies. Australia’s water supplies are already under tremendous stress due to drought, climate change, population growth and pollution. But an additional challenge for the Nation’s water industry is an observed increase in algal bloom development and elevated organic matter content in our waterways.

Dr Henderson, who has more than 10 years’ experience in the area of algal and organic matter treatment and monitoring, says these problems cost millions of dollars to manage annually. The water industry has to contend with the possible release of toxins, and taste and odour compounds, from algae into the water supply, while waterways affected by increased organic matter content are at risk of producing potentially harmful disinfection by-products that result from reactions between organic matter during disinfection.

“It is critical that sustainable and robust water treatment technologies and associated monitoring techniques are developed and optimised to deal with these scenarios,” Dr Henderson says.

With the help of industry partnerships, ARC grants and other funding sources, Dr Henderson and her team have developed a novel dissolved air flotation process to treat algal blooms. “We’ve shown at pilot scale that we can treat high concentrations of algae effectively and efficiently, while reducing chemical consumption and waste stream volume,” she says.

“Our research has also led to a better understanding of the impact of algae and organic matter on treatment process performance and we have developed a method that uses fluorescence probes to monitor water quality. These probes can act as an early warning device.”

“For Water Research Australia it’s important that collaborative research projects engage with industry to ensure the transfer of knowledge and adoption of research outcomes, and Dr Henderson does this extremely well.”

Claire McInnes
Program Coordinator for Water Research Australia, a not-for-profit company which undertakes collaborative research on all aspects of drinking water, recycled water and wastewater. She has worked with Dr Henderson on a number of water quality research projects.

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Partnership in summary

Partner: Emirates Global Aluminium (Formerly Dubai Aluminium Company)
Type of partnership: Contract research
Collaborating since: 2009

Funding:
$528,000 in cash, plus significant in-kind contribution.

Purpose:
To develop a low cost, low maintenance and robust approach for online monitoring and analysis of the aluminium smelting process.

Outcomes:
1. An intelligent instrumentation scheme for online monitoring and analysis.
2. Algorithms/software to detect, in real time, conditions that adversely impact energy and environmental efficiencies.
3. Two filed patent applications.

International process control expert, Professor Jie Bao from the School of Chemical Engineering, teamed up with world experts in electrochemistry, Professors Barry Welch and Maria Skyllas-Kazacos, to help Emirates Global Aluminium (EGA), one of the world’s largest aluminium smelters, improve the efficiency of their smelting operations.

The primary production of aluminium is highly energy intensive. With energy costs representing 22–36% of operating costs in smelters, it’s no wonder the industry is looking for more energy-efficient production technologies.

“In recent years, productivity and flexibility have become important economic drivers due to the changing cost structure for aluminium smelting. But unfortunately, operating practices modified to meet these requirements have increased the frequency of abnormalities, adversely impacting energy and environmental efficiencies,” Professor Bao explains.

“This has led to a need to be able to monitor the operation of smelting cells online; estimate some key process variables that cannot be directly measured; and detect abnormal conditions in real time.”

The partnership between EGA and UNSW started in 2009, when Professors Bao, Welch and Skyllas-Kazacos were working on a project funded by CSIRO. “We collaborated with EGA on a number of experimental studies with industrial operating cells and had such promising outcomes that EGA decided to fully fund this new research project,” says Professor Bao. “This is a truly interdisciplinary project that was developed based on our expertise in process control and electrochemistry.”

The project has resulted in some very useful outcomes for the aluminium industry. The first, which Professor Bao says is already implemented in a number of smelting cells in operation at EGA, is a cost-effective, low maintenance intelligent instrumentation scheme to monitor anode current distribution in real time. The second is the development of software to detect, in real time, conditions that adversely impact energy and environmental efficiencies. Two patents have been filed as a result.

“It was my personal pleasure to work with such a great team on this breakthrough project. I enjoyed the process and found the outcomes very valuable and useful not only for EGA but for the entire industry. The results have the potential to improve the efficiency of the aluminium smelting process from both a productivity and environmental point of view by decreasing the energy and manpower requirements.”

Sergey Akhmetov
Vice President-Reduction, Emirates Global Aluminium

Industry partnership
New approaches improve aluminium smelting processes

Featured expert: Professor Jie Bao

Professor Jie Bao is a process control expert of international repute. He leads the Process Control Research Group at the School of Chemical Engineering, and has been awarded more than $3.5 million in competitive research grants from the Australian Research Council, CSIRO and industry. He has published extensively in major process control and chemical engineering journals and is an Associate Editor of the Journal of Process Control.
"We welcome all enquiries about engagement and partnership opportunities and I invite you to connect with us to explore further ways of linking our remarkable researchers and facilities with your needs and ambitions."

Professor Vicki Chen
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