



**UCL**

# Chemical Engineer in the Classroom

**Connect your class with UCL  
Researchers**

## Contact Details

020 7679 7092

[Chemeng.outreach@ucl.ac.uk](mailto:Chemeng.outreach@ucl.ac.uk)

[www.ucl.ac.uk/chemical-engineering](http://www.ucl.ac.uk/chemical-engineering)

[@uclchemeng](https://twitter.com/uclchemeng)



# Meet the Researchers

**This booklet provides details of the departmental PhD students and Research Fellows and the focus of their research.**

Our researchers are available to 'meet' with your class online to give a talk and answer questions on their field of study.

To book an online session please contact the Chemical Engineering Outreach Team who will be happy to discuss topics and themes as well as a suitable time and date.

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## Nidhi Kapil

PhD Researcher



“I am a PhD researcher in the Nature Inspired Chemical Engineering with a background in Chemistry. My main area of interest is nanomaterial designing and synthesis, focussing on various applications such as catalysis, stimuli-responsive hydrogels, anti-microbial surfaces and electrochemistry. When designing materials, it is always important to see their applications in the real world, that is how I landed in the world of Chemical Engineering visualising the actual applications of Chemistry. My PhD project aims at designing a stable yet selective catalyst to produce propylene oxide from propylene via a greener and simple route. This project takes a multiscale approach from nano to meso to macro scales, to address the challenge of producing a stable propylene oxidation catalyst.”

### Specialist Topics

- Nanoparticle synthesis
- Anti-microbial surfaces
- Catalysis
- 2D functional materials

**Click for [Nidhi's Profile](#)**

If you would like Nidhi to talk to your class about her research please contact the Chemical Engineering Outreach team at UCL.

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## Alice Llewellyn

PhD Researcher



“After completing my undergraduate degree in chemistry, I decided to pursue a PhD researching lithium ion batteries. Lithium ion batteries are a key technology for the electrification of vehicles. One of the key challenges is extending battery life, my project looks into the degradation mechanisms of lithium ion batteries in order to be able to predict degradation and combat it.”

### Specialist Topics

- Lithium ion batteries
- Fuel Cells
- Renewables

If you would like Alice to talk to your class about her research please contact the Chemical Engineering Outreach team at UCL.

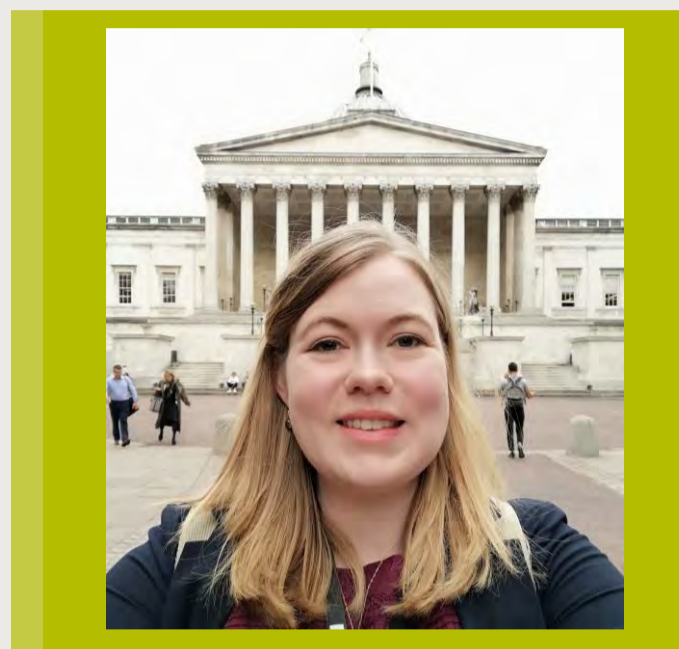
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## Dr Isobel Mackay

Lecturer in Global Management  
Of Natural Resources



“I am an Earth Scientist turned Chemical Engineer with a background in Geophysics (how we can use physics to understand the inside of the Earth). Increasing the use of renewable energy is vitally important to tackle climate change, however these technologies rely heavily on several critical minerals. These minerals need to be mined, yet mining is traditionally a “dirty industry”, and as such can influence the true environmental impact of renewable energy. My research investigates how we can alter the processes used to extract these critical minerals from bulk rock, in order to improve the sustainability of the mining industry.”

### Specialist Topics

- Renewable Energy
- Sustainability
- Mining and Minerals Processing
- Natural Resources

**Click for [Isobel's Profile](#)**

If you would like Isobel to talk to your class about her research please contact the Chemical Engineering Outreach team at UCL.

020 7679 7092

Chemeng.outreach@ucl.ac.uk



## Robert Mather

PhD Researcher



“I am an electrochemical engineering PhD researcher with a background in Physics. The need to decarbonise our transport industry has led to many new solutions for electrical transportation. The most promising technologies we currently have are electrochemical cells (batteries) and fuel cells. Fuel cells and Li-ion batteries have significant benefits over internal combustion engines when working on their own; however, when a fuel cell is hybridised with a battery the benefits are amplified. There are substantial technical challenges with combining these technologies in terms of electrical and thermal integration and my research focuses on finding solutions to these challenges.”

### Specialist Topics

- Proton Exchange Membrane Fuel Cells
- Hybrid fuel cell vehicle system design and modelling
- Electric vehicles
- Fuel cell performance in a varied range of conditions
- Li-ion batteries and automotive systems

Click for [Robert's Profile](#)

If you would like Robert to talk to your class about his research please contact the Chemical Engineering Outreach team at UCL.

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## Elan Mistry

PhD Researcher



“I am a Chemical engineering PhD researcher with a background in Chemistry. My focus is on how we can use solar energy to drive chemical/electrochemical reactions. My PhD research pertains to finding an alternative, renewable method, to the Haber Bosch process whereby nitrogen is converted to ammonia. My Masters research involved using simulated solar irradiation on an inorganic semiconductor to convert carbon dioxide and hydrogen into alternative compounds such as carbon monoxide and methane.”

### Specialist Topics

- Renewable energy
- Photo-electrochemistry
- Solar energy
- Nanomaterials

If you would like Elan to talk to your class about his research please contact the Chemical Engineering Outreach team at UCL.

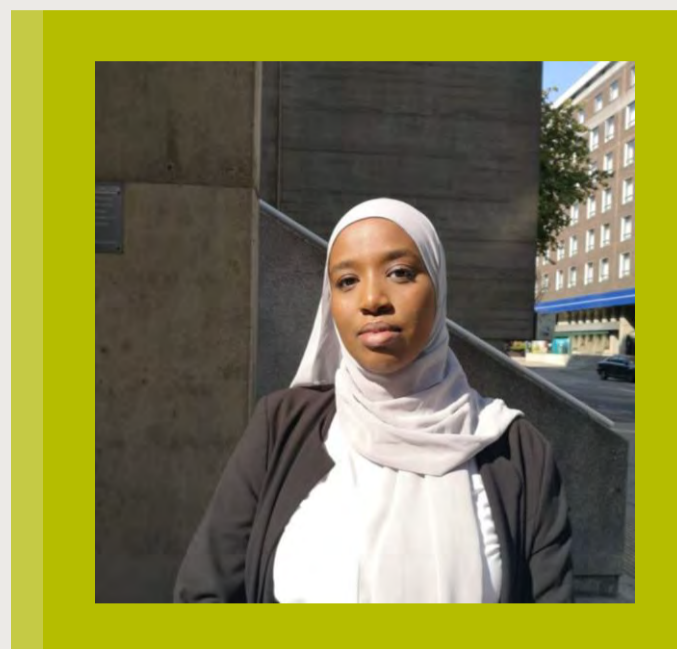
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## Halan Mohamed

PhD Researcher



“I am currently completing my PhD in Nature Inspired Chemical Engineering (NICE) and have a background in Chemical Engineering. NICE is a methodology to systematically take inspiration from nature and adapt it to solve engineering problems. My research focuses on membrane technologies used to purify water using a semi-permeable barrier to selectively remove contaminants. One of the major downfalls of this technology is the declining performance due to the “dirtying” (more commonly known as fouling) of the membrane by dissolved and suspended matter i.e., bacteria. To solve this problem, I use inspiration from the kidney to take a multiscale approach to synthesise anti-fouling membranes using advancements in nanotechnology and engineering.”

### Specialist Topics

- Polymer chemistry
- Polymer brushes
- Membrane technologies
- Water treatment
- Antimicrobial surfaces
- 3D printing

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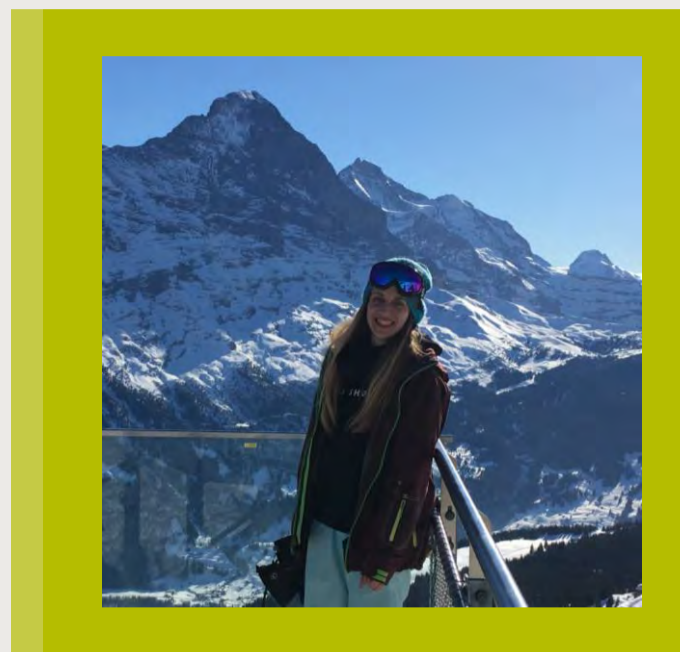
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# UCL

## Isabella Mombrini

PhD Researcher



“I am a material scientist specialising in polymers, nanomaterials and lithium-ion batteries. I took my masters degree in soft materials at the Adolph Merkle Institute in Switzerland. For my PhD I am working at the synchrotron placed at the ESRF in Grenoble (France). I am working full time on the beamline with advanced diffraction methods for characterization on lithium-ion batteries. The aim of the project is to collaborate with an industry, helping them to improve their battery material currently in use.”

### Specialist Topics

- Polymers
- Nanomaterials
- Plastics particles in the environment
- Lithium-ion batteries

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## Dr Alex Norori-McCormac

Lecturer



“I am a chemical engineer with a background in geology, mining and mineral processing. The world we live in today is completely dependent on the accessibility and availability of natural resources such as hard rock minerals and metals, oil and gas, water and so on. These are critical resources that power our society, but there is a disconnect between the reality of resource extraction and the public perception of these industries. My research focuses on improving the recovery of critical minerals during the extraction process; I also engage in the life cycle of these minerals in my teaching, from their formation to extraction, processing and the final product, as well as the environmental impact of these processes, and how we can work on the sustainability of such operations.”

### Specialist Topics

- Geology (natural resource formation)
- Mining
- Mineral processing
- Metals production
- Environmental practice in the resource industries.

Click for [Alex's Profile](#)

If you would like Alex to talk to your class about his research please contact the Chemical Engineering Outreach team at UCL.

020 7679 7092

Chemeng.outreach@ucl.ac.uk



## Dr Anand Pallipurath

Post-Doctoral Research Fellow



“I am a Biochemical Engineer, specialising in micro-engineering systems for various (bio)chemical and microbiological applications with experience in microfluidics, computational fluid dynamics, high-speed imaging, and advanced computational image processing. Over the years, I have developed various imaging platforms to capture rapid events occurring at the micro-scale using a high-speed camera and have used computer programming to extract valuable data from videos/pictures to elucidate mechanisms of various industrial processes. Such knowledge not only helps engineers achieve better control over process parameters, but also provides valuable insights to scientists on novel topics.”

### Specialist Topics

- Fluid flow
- Microfluidics
- Micro-engineering
- Optical imaging
- Computational image processing
- Image diagnostics for Li-ion batteries
- Diagnostic device development for healthcare

Click for [Anand's Profile](#)

If you would like Anand to talk to your class about his research please contact the Chemical Engineering Outreach team at UCL.

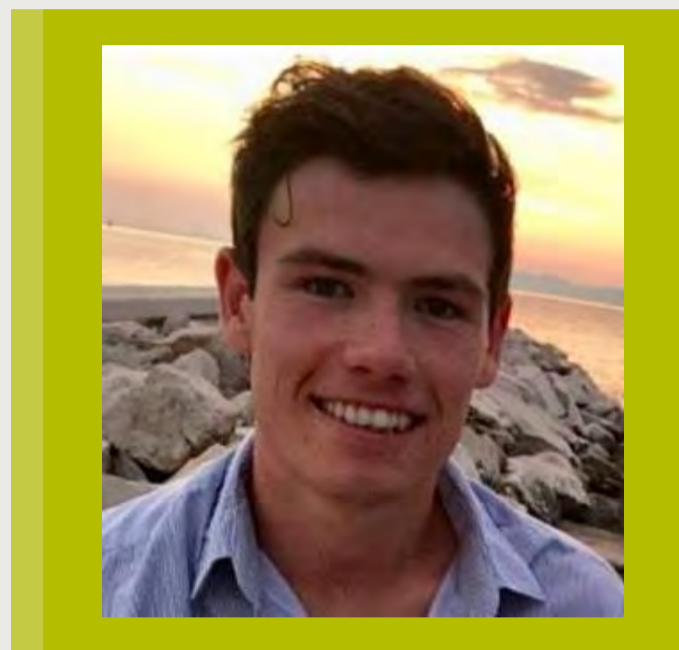
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## Keenan Smith

PhD Researcher



“I am a Chemistry graduate pursuing a PhD in the electrochemical innovation laboratory, exploring proton exchange membranes for use in electrochemical devices, such as fuel cells. The molecular structure and mobility of the polymer chains and water present within these materials determine their ability to conduct ions and thus the efficiency of these devices. I use advanced characterisation techniques, including neutron scattering, to investigate these structure-property relationships with the aim of designing improved materials.”

### Specialist Topics

- Polymers
- Fuel cells
- Renewable energy
- Batteries
- 2D materials

Click for [Keenan's Profile](#)

If you would like Keenan to talk to your class about his research please contact the Chemical Engineering Outreach team at UCL.

020 7679 7092

[Chemeng.outreach@ucl.ac.uk](mailto:Chemeng.outreach@ucl.ac.uk)



**Department of Chemical Engineering  
2<sup>nd</sup> Floor  
Roberts Building  
Torrington Place  
London  
WC1E 7JE**

**020 7679 7092  
Chemeng.outreach@ucl.ac.uk  
www.ucl.ac.uk/chemical-engineering  
@uclchemeng**