



## DEPARTMENT OF CIVIL ENGINEERING

## SEMINAR

**Sustainable Production of Nanostructured Membranes**

Professor Kang Li

Chemical Engineering at Imperial College London

Date: July 18, 2025 (Friday)

Time: 10:00 a.m. – 11:00 a.m.

Venue: Room 612B, 6/F Haking Wong Building, The University of Hong Kong

**Abstract**

Phase inversion by means of immersing precipitation has led to the industrial production of reverse osmosis and ultrafiltration membranes in quantity, which significantly changed the water reclamation technologies by using membranes as an energy-saving separator. Over the past 60 years of development, porous membranes prepared by phase inversion have been applied in broader separation contexts for drinking water production, wastewater treatment, dialysis, beverage clarification, etc. However, a technological limit has been reached, and there has been no significant breakthrough over the last decade in terms of new manufacturing procedures which produce membranes with high performances in an environmentally benign and sustainable way. Water permeability determines the membrane's filtration efficiency, but the phase inversion technique creates membranes with low permeance and wide variation of pore sizes. Pore uniformity and controllability are essential for the separation capability of the membrane, yet phase inversion lacks control over the membrane structure. This presentation will introduce a new approach, termed Combined Crystallization and Diffusion, that simultaneously achieves both ultrahigh water permeation and pore size tunability on both surfaces of the membrane product. Our work will greatly advance the manufacturing of porous polymeric membranes by significantly increase the filtration efficiency and production sustainability of phase inversion membranes to meet the global challenge of water supply.

**About the Speaker**

Professor Kang Li has been a Professor of Chemical Engineering at Imperial College London since 2007. Currently, he leads a research group (10 post-docs/PhDs) at Imperial to conduct multidisciplinary research in membrane science, solid oxide fuel cells, wastewater treatment, membrane catalysis, separation processes and reaction engineering. He received Rector's Award and Research Excellence Award at Imperial in 2007 and MND R&D Award 2013, Singapore. His commitment to working at interdisciplinary boundaries is evidenced by his involvements as an editorial board member of Journal of Membrane Science, Elsevier (Membrane Technology) Journal of Chemical Technology and Biotechnology, Wiley (Chemical Technology) and Polymers, MDPI, Switzerland (Polymer Science) and Reactive and Functional Polymers, Elsevier (Functional Polymers). He has published regularly in international refereed journals (cited over 28400 times) with h-index of 88 (Google Scholar: <https://scholar.google.com/citations?user=mjmj79wAAAAJ&hl=en>) and has authored a book on Ceramic Membranes for Separation and Reaction (Wiley 2007). He is a Chartered Engineer and a Fellow of the Institution of Chemical Engineers.

- ALL ARE WELCOME -