香港中文大學
The Chinese University of Hong Kong

香港中文大學理學院
FACULTY OF SCIENCE
THE CHINESE UNIVERSITY OF HONG KONG

SCIENCE FACULTY
RESEARCH DAY 2026

RESEARCH IMPACT DEVELOPMENT AT THE SCIENCE FACULTY

19 MAY 2026 (TUE) 2:00 PM – 5:30 PM

LECTURE THEATRE 1, 7/F, MONG MAN WAI BUILDING (MMW BUILDING), THE CHINESE UNIVERSITY OF HONG KONG


Science Empowers Your Dreams
Learn Science to Better the World

PROGRAMME

2:00 - 2:10 pm	**Welcoming Remarks** ***Professor Chunshan SONG*** Dean of Science
2:10 - 2:55 pm	Keynote Lecture: **Bridging the Gap between Basic Research and Impact through R&D of Scientific Findings** ***Professor Nathalie WONG*** Department of Surgery, Faculty of Medicine, CUHK
2:55 - 3:40 pm	Keynote Lecture: **Soybean Research: From Basic Science to Impacts** ***Professor Hon Ming LAM*** School of Life Sciences, Faculty of Science, CUHK
3:40 - 4:00 pm	Keynote Sharing: **Entering the Era of Targeted Radiotherapy: Boron Drug Development for BNCT** ***Professor Zuowei XIE*** Southern University of Science and Technology
4:00 - 4:40 pm	**Tea Reception**
4:40 - 4:55 pm	Sharing from Faculty Member: **Computer Modeling of Condensate-Membrane Interactions** ***Professor Yi WANG*** Department of Physics, Faculty of Science, CUHK
4:55 - 5:10 pm	Sharing from Faculty Member: **From Lab to Market: Commercialisation of Eco-Engineering Hollow Spheres for Sustainable Alternatives and Aquatic Protection** ***Professor To NGAI*** Department of Chemistry, Faculty of Science, CUHK
5:10 - 5:25 pm	Sharing from Faculty Member: **From Geometry to Industrial Applications** ***Professor Lok Ming LUI*** Department of Mathematics, Faculty of Science, CUHK
5:25 - 5:30 pm	**Closing Remarks**

Message from the Dean of Science

Welcome to the Science Faculty Research Day 2026 at The Chinese University of Hong Kong (CUHK). Every year, the Faculty organises this event as a vital platform for researchers to exchange ideas, showcase new findings, and spark the kind of collaborative spirit that advances our academic community. Research is the fundamental engine of discovery and innovation that can also turn curiosity into practical solutions for the world. This year's theme, "Research Impact Development at the Science Faculty", addresses the significance of establishing clear pathways that bridge the gap between scientific discovery and societal benefit.

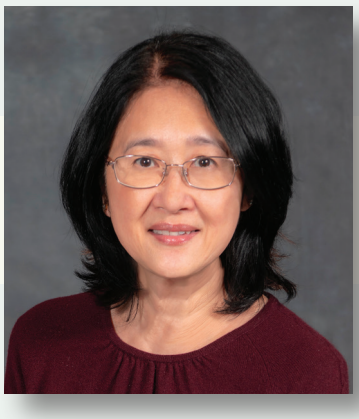
Dr. Jonas Edward SALK, the virologist who developed one of the first successful polio vaccines, once said, "*The social world cannot exist on one side and the scientific world on the other because the scientific realm is merely the end result of many other operations that are in the social realm*". This perspective aligns closely with our Faculty motto, "Science empowers your dream. Learn Science to Better the World". Our Faculty does not only value profound, high-impact research at the forefront of knowledge but also affirms the importance of translational work that brings positive change to society. Furthermore, since the Research Assessment Exercise (RAE) 2020, the ability to demonstrate how research outputs deliver tangible economic and societal benefits has become important. In part to support this and foster collaborative research based on new and original ideas developed at CUHK, our Faculty established the Collaborative Research Impact Matching Scheme (CRIMS) in Fall 2020. This first-of-its-kind seed funding at CUHK aims to nurture collaborative research, helping colleagues develop new ideas in order to secure large competitive external grants and develop future impact cases.

This year, three distinguished scholars have been invited to lead the keynote session. Prof. Nathalie WONG from Department of Surgery (CUHK), Prof. Hon Ming LAM in life sciences, and an esteemed friend of our Faculty, Professor Zuowei XIE, a member of the Chinese Academy of Sciences, will share how their research has influenced both the fundamental science and the wider community. Additionally, the event features three excellent researchers who have utilised CRIMS support to explore new ideas through collaborative research and prepare competitive grants or submit impact cases for RAE 2026. Prof. To NGAI in chemistry, Prof. Lok Ming LUI in mathematics and Prof. Yi WANG in physics will share their impact pathways and experiences.

We believe that the exchange of ideas, presentations, and discussions centred on collaborative research and impact development during Research Day 2026 will embody the true purpose of this annual event. We hope these interactions would inspire researchers for continued pursuit of excellence through effective collaborations. I look forward to a stimulating Research Day where participants will engage actively in lively discussions and exchange ideas, share experiences and insights that inspire collaboration and innovation. I hope all participants find their experience at Research Day 2026 both rewarding and inspiring.

Prof. Chunshan SONG
Dean of Science and
Wei Lun Professor of Chemistry

Keynote Lecture:
Bridging the Gap between Basic Research and Impact through R&D of Science Findings



Professor Nathalie WONG

- Professor, Department of Surgery, Faculty of Medicine, CUHK

Hepatocellular carcinoma (HCC) is one of the most prevalent and deadly malignancies in China, with a five-year recurrence rate at ~70% after liver resection. This posing a severe problem to public health. Intratumor heterogeneity and divergent clonal lineages within and among primary and recurrent HCCs remain challenges to clinical management of patients. Investigations into the genetic and epigenetic variations within HCC tumors, among hepatic lesions, and between primary and relapsing tumors led to discoveries on codependence of phylogenetic and phyloepigenetic features in tumor evolution, and understandings on post-operative recurrence. Alternative splicing (AS) allows generation of cell-type specific mRNA transcripts that contributes to almost all hallmarks of cancer when dysregulated. By long-read sequencing, a comprehensive AS landscape in HCC was defined for the first time. Tumor associated mRNA splicing events were found in vast GO categories including the ubiquitin–proteasome system. Ubiquitin receptor AS variant, ADRM1-ΔEx9, redirects ubiquitin proteasome specificity to selectively degrade tumor suppressor protein FBXW7, whereby promotes HCC tumor formation and provide a window of synthetic lethal link for PARPi therapy. Finally, I shall present a proof-of-concept study on patient-derived organoid (PDO) guided off-label use of drug in 2 advanced inoperable HCC patients. The outcome highlights the predictive value and clinical relevance of PDO findings in supporting patient management.

Biography

Prof. Nathalie WONG obtained her D.Phil. in Clinical Biochemistry from the University of Oxford, UK, and later post-doctoral training at King's College School of Medicine and Dentistry, University of London, UK. She is now Professor and Director of Laboratory at the Department of Surgery, The Chinese University of Hong Kong. Prof. Wong's research focuses on understanding the molecular carcinogenesis of human hepatocellular carcinoma (HCC; also commonly known as liver cancer). Her group has previously defined key molecular events in HCC and its clonal trajectories during evolution. Prof. Wong's current research includes long-read transcriptome sequencing of HCC to define tumor-related splicing variants, mechanistic investigations of somatic alterations for their cancer-causing effects and tumor intrinsic genetic events in mediating immune escape of HCC. Over the years, Prof. Wong and her team have also established a number of HCC ex-vivo models of both 2D cell lines and 3D organoids that were directly established from patient's tumoral tissue. These bona fide patient-derived models have been an invaluable resource to her team's research in functional biology, new drug developments and contemporary oncology research.

Keynote Lecture:

Soybean Research: From Basic Science to Impacts

Professor Hon Ming LAM

- Choh-Ming Li Professor of Life Sciences
- School of Life Science, Faculty of Science, CUHK

Global climate change poses a severe threat to agricultural productivity and stability. Predictive models indicate likely declines in crop yields and quality, alongside increasing pressure on freshwater resources. At the same time, conventional food production is a major source of greenhouse gas emissions, with agrochemical use playing a central role. For example, the life cycle of synthetic nitrogen fertilizers accounts for approximately 5% of total global emissions.

Soybean offers a sustainable alternative. As a legume, it supports sustainable agriculture through symbiotic nitrogen fixation, reducing the need for synthetic fertilizers. Soybean is also a critical global food source, providing 28% of the world's plant oil and 70% of its protein meal.

Our research integrates genomic studies and field analyses to investigate soybean seed resources. By identifying key genes associated with stress tolerance, we aim to develop new, climate-resilient soybean varieties capable of thriving in suboptimal environments. This work provides a direct pathway to enhancing crop resilience and advancing sustainable agricultural practices.

Prof. Hon Ming LAM is the Choh-Ming Li Professor of Life Sciences at The Chinese University of Hong Kong, where he also serves as Director of the State Key Laboratory of Agrobiotechnology and the Institute of Environment, Energy and Sustainability. An internationally recognized scientist, he has authored 265 highly cited publications and holds a Web of Science h-index of 54.

Prof. Lam is a trailblazer in plant genomics. His landmark research first uncovered the vast genetic diversity of wild soybeans, establishing them as a vital resource for crop improvement. He later led an international consortium to construct the world's first high-quality reference genome for wild soybean, providing an indispensable tool for breeders.

His work consistently bridges fundamental science with real-world impact. By identifying key stress-tolerance genes, his team has developed new soybean varieties now cultivated on over 100,000 hectares. This has generated millions in additional farmer income while significantly reducing carbon emissions. His vision extends to strengthening global food security through projects in developing nations, where he develops stress-tolerant seeds and trains local scientists to build long-term agricultural resilience.

Finally, drawing from his soybean and agricultural research, Prof. Lam has developed a STEAM education program for high school students that emphasizes the connection between science and humanity.

Keynote Sharing:

Entering the Era of Targeted Radiotherapy: Boron Drug Development for BNCT

Professor Zuowei XIE

- Chair Professor and Dean of Shenzhen Grubbs Institute, Southern University of Science and Technology
- Member of the Chinese Academy of Sciences
- Member of the Hong Kong Academy of Sciences
- Fellow of Chinese Chemical Society
- Fellow of Royal Society of Chemistry

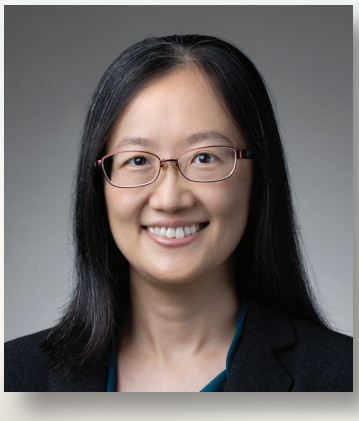
Boron Neutron Capture Therapy (BNCT) is the radiotherapy method with the greatest potential for targeted treatment, and is expected to usher tumor therapy into the era of "targeted radiotherapy." BNCT is a binary treatment modality that combines boron-containing drugs with neutron irradiation. It utilizes boron-containing drugs to achieve enrichment of the boron-10 isotope in tumor cells and subsequently exploits the selective absorption of neutrons by boron-10 to effectively kill cancer cells at the cellular scale. In China, BNCT technology is generally still in its nascent stage. Relying on major scientific achievements from the Spallation Neutron Source, a BNCT facility was established in Dongguan. The development of boron drugs with high selectivity and high enrichment has become the greatest challenge and the bottleneck in the advancement of BNCT therapy. This talk will briefly describe the current status of boron drug development, existing problems and challenges, and discuss how to address key scientific issues.

Prof. Zuowei XIE is a member of The Chinese Academy of Sciences and The Hong Kong Academy of Sciences. He is also a Fellow of Chinese Chemical Society and Royal Society of Chemistry. Prof. Xie is a Chair Professor and Dean of Shenzhen Grubbs Institute at Southern University of Science and Technology.

Prof. Xie's main research interests centre around organometallic, main group chemistry and boron-containing drugs with the focus on catalytic B-H bond functionalization, (super)carboranes, metallacarboranes, low-valent boron chemistry, small molecule activation, homogeneous catalysis, and the development of new boron-containing drugs for boron neutron capture therapy (BNCT). Prof. Xie has made important contributions to carborane chemistry by developing a general strategy for catalytic selective cage BH functionalization and synthetic methods for the synthesis of supercarboranes.

Prof. Xie received several prestigious awards including the State Natural Science Prize (2008), The Croucher Award (2003), the Chinese Chemical Society Yao-Zeng Huang Award in Organometallic Chemistry (2010), Hong Kong Research Grants Council Inaugural Senior Research Fellowship Award (2020), and Humboldt Research Award (2022) among others.

Sharing from Faculty Members:



Computer Modeling of Condensate-Membrane Interactions

Professor Yi WANG

Professor, Department of Physics, CUHK

The efficacy of many biomolecular therapeutics, such as peptides and mRNAs, rely on their efficient intracellular delivery, which is frequently hindered by the poor membrane permeability and/or low endosomal escape efficiency of macromolecules. Recent studies on condensates that arise from liquid-liquid phase separation (LLPS) indicate that condensates formed by phase-separating peptides or fluorescent molecules can recruit macromolecular cargoes and deliver them intracellularly with high efficiency. However, our understanding on the mechanism by which the cargo-carrying condensates enter the cell and how condensate-membrane interactions can be tuned by physico-chemical properties of the phase-separating molecules remain limited. In this talk, I will discuss our recent collaboration with Prof. Jiang Xia on a photo-responsive, phase-separating fluorescent molecule (PPFM) based on pyrene that undergoes LLPS in the aqueous solution and recruit payload molecules into the resulting condensate. Through simulations of the condensate-membrane systems and drawing analogy to small-molecule permeation, I will discuss the conditions under which PPFMs may spontaneously penetrate the membrane and achieve the co-transport of their payload molecules.

Prof. Yi WANG is a professor at the Department of Physics, Faculty of Science, The Chinese University of Hong Kong. Her group works on molecular dynamics (MD) simulations of biomolecules, with research topics spanning all four categories of biological macromolecules, namely, proteins, lipids, carbohydrates as well as nucleic acids. Recent work from her group includes the calculation of free energy barriers against drug or drug-like molecules' permeation, the characterization of nanoparticle-membrane interactions, the activation and function mechanism of enzymes as well as the structure and dynamics of condensates formed via liquid-liquid phase separation.

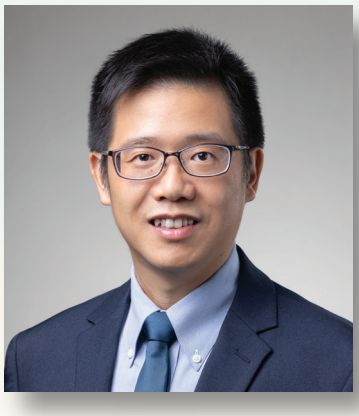
From Lab to Market: Commercialisation of Eco-Engineering Hollow Spheres for Sustainable Alternatives and Aquatic Protection

Professor To NGAI

Assistant Dean (Research)
Professor, Department of Chemistry, CUHK

Hollow spheres are powders with interior cavities ranging from nanometers to micrometers. Their unique properties—such as high optical contrast and low density—make them indispensable in industrial coatings requiring opacity and brightness. The development of advanced manufacturing techniques for hollow particles is therefore of growing importance. Since 2006, our group at CUHK has pioneered the use of Pickering emulsions as templates to engineer hollow spheres with tailored size, permeability, mechanical strength, and biocompatibility. This fundamental research laid the groundwork for practical applications and culminated in the establishment of the spin-out company O-Spheres in 2022, supported by CUHK's TSSSU and TSSSU+ schemes. In 2023, O-Spheres joined the Hong Kong Science and Technology Parks Incubation Programme, accelerating the transition from laboratory innovation to market-ready products. The resulting technology provides a sustainable alternative to conventional UV filters, mitigating threats to aquatic ecosystems while enhancing user experience. This successful translation from lab to market underscores the societal, environmental, and commercial value of hollow sphere innovation, exemplifying how academic research can drive impactful technological advancement.

Prof. To NGAI is a Professor of Chemistry and Assistant Dean (Research) in the Faculty of Science at The Chinese University of Hong Kong (CUHK), as well as a Fellow of the Royal Society of Chemistry. He earned his B.Sc. (1999) and Ph.D. (2003) at CUHK, specializing in polymer interactions, before postdoctoral appointments at BASF (Germany) and the University of Minnesota. Returning to CUHK in 2006, he advanced from Research Assistant Professor to Full Professor in 2017. His research spans colloids, polymers, surface chemistry, and soft matter. Prof. Ngai has published over 270 papers, with more than 12,000 citations and an h-index of 58 (Google Scholar). His achievements include the CSJ Lectureship Award (2020) and the Paul J. Flory Research Prize (2023, Polychar World Forum, Nice). Since March 2026, he has served as Senior Editor of Langmuir (ACS).



From Geometry to Industrial Applications

Professor Ronald Lok Ming LUI

Professor, Department of Mathematics, CUHK

This talk explores how computational quasiconformal geometry can be transformed into practical tools with real-world impact. I will present how advanced mathematical theory has been translated into industrial solutions in agriculture, electronic system design, and healthcare. More specifically, I will demonstrate how computational quasiconformal geometry improves farmland monitoring accuracy, reduces costs, enhances large-scale electronic simulations, and enables more accurate medical imaging and earlier scoliosis detection. These outcomes illustrate how abstract geometry theories can drive innovation, generate socio-economic value, and create tangible benefits across multiple sectors.

Prof. Ronald Lok Ming LUI is a Professor in the Math department of The Chinese University of Hong Kong (CUHK). He is also serving as the Executive Director of the Centre for Mathematical Artificial Intelligence (CMAI), under Department of Mathematics and Institute of Mathematical Sciences at CUHK. Ronald got his PhD in Applied Mathematics at UCLA Math department in June 2008, under the supervision of Prof. Tony F. Chan. Before joining CUHK, he worked as a Postdoctoral Scholar for 2 years at Harvard Math department, hosted by Prof. Shing-Tung Yau. He was awarded the Morningside Mathematics (Silver) Medal during the International Congress of Chinese Mathematicians in 2016. In 2018, he was awarded the HKMS Young Scholars Award by the Hong Kong Mathematical Society. In 2019, he was awarded the Vice-Chancellor's Exemplary Teaching Award.

Notes

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