HKUST CBE

香港科技大學
THE HONG KONG UNIVERSITY OF SCIENCE AND TECHNOLOGY

DEPARTMENT OF CHEMICAL AND BIOLOGICAL ENGINEERING
化學及生物工程學系

The Department of Chemical and Biological Engineering

Issue of 2025

Building Tomorrow's Materials Today

Contents

Message from the Department Head

CBE Powers Ahead: Energy, Record Growth, and a Family of Excellence

The Department of Chemical and Biological Engineering thrives as a family united in excellence, making 2025 a landmark year of remarkable progress. From surging enrollments to groundbreaking research, we advanced with strategic vision and family-like collaboration. It is with pride and gratitude that I share how these collective efforts have propelled us forward.

Pride of the Year: Surging Enrollment and Faculty Expansion

Reflecting on the past year, one of our proudest achievements is the department's remarkable undergraduate enrollment growth of approximately 50%, made possible by our collective efforts to implement a hybrid admission scheme. This strategic change has elevated student quality, significantly increased departmental resources, and enabled us to expand our faculty team, ensuring outstanding instruction and research mentorship as our programs grow.

A Promising Future: New Programs, New Possibilities

To meet evolving industry and societal demands, we proudly launched two forward-looking programs this year: the Bachelor of Engineering in Energy and Environmental Engineering and the Master of Science in Materials Engineering. In addition, we are integrating more artificial intelligence and biomedical engineering into our curriculum. The establishment of the new Medical School further amplifies these opportunities, opening exciting avenues for collaboration in cancer research and biomedical innovation and positioning our faculty at the forefront of translational discovery. With these developments, CBE is well placed for sustained growth and lasting impact.

The CBE Family: The Backbone to Excellence and Passion

CBE has been my academic home, and leading it remains a privilege guided by one clear goal: to strengthen our family-like community where trust, collegiality, and respect empower us to excel. The enduring commitment of our long-serving colleagues, echoed in the warm atmosphere they describe, affirms that this supportive culture is now our greatest strength. This is where passion fuels purpose and strong foundations shape excellence across generations. My sincere gratitude goes to every faculty member, staff, student, and alumnus who makes this possible. Building on this solid backbone, my advice to young researchers and students is simple: stay passionately curious, because genuine interest is the only sustainable fuel in academia; ***without it, work becomes just a job.***

This edition celebrates our collective joy and success over the past year, and we warmly invite you to stay connected and be part of our journey.

Professor Minhua Shao
Head and Chair Professor, CBE
Cheong Ying Chan Professor of
Energy Engineering and Environment

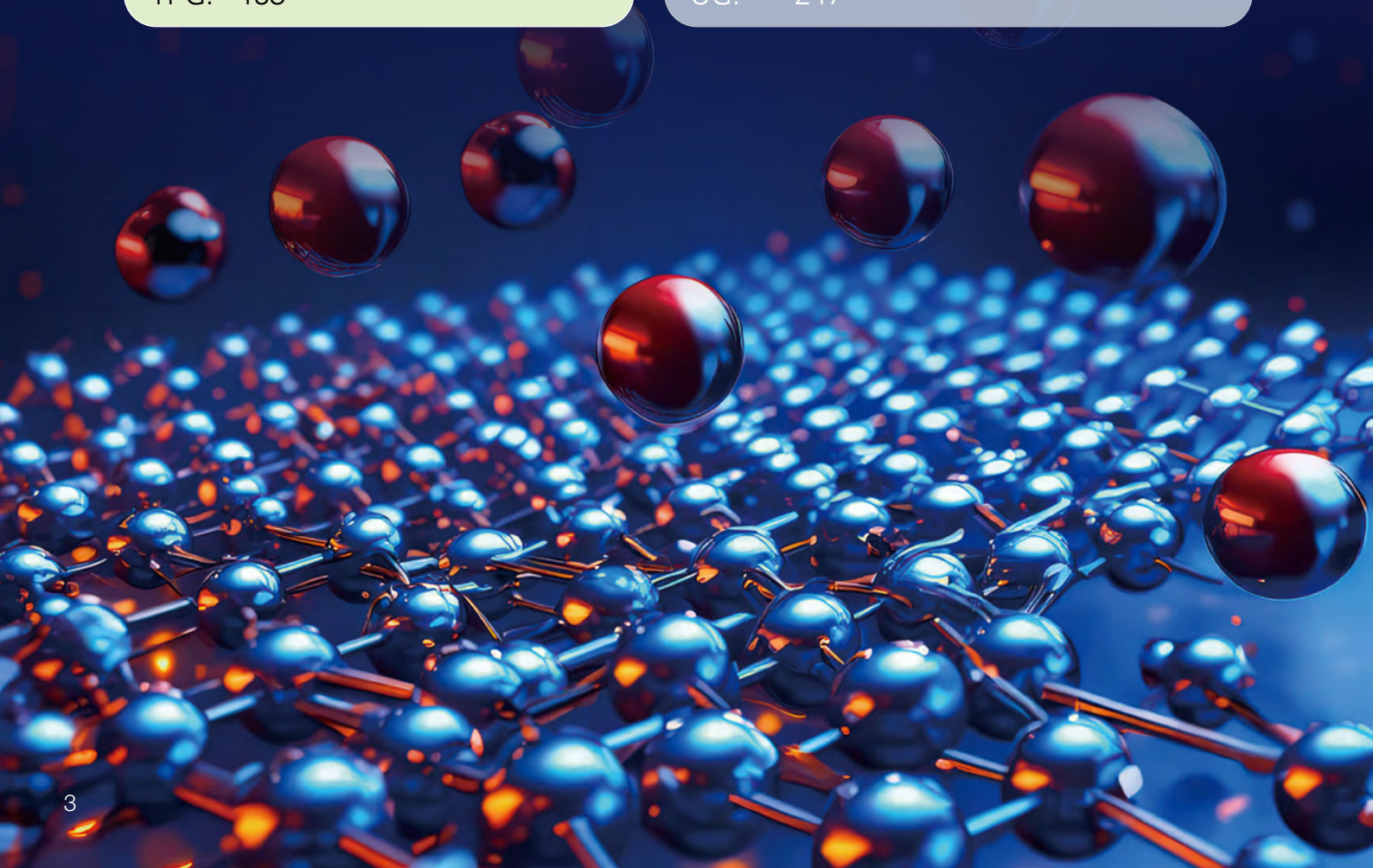
CBE at a Glance

Faculty and Staff

Regular Faculty	25
Jointly Appointed Faculty	3
Zero Percent Jointly Appointed Faculty	13
Research Assistant Professor	7
Teaching Track Faculty	4
Adjunct Faculty	5
Emeritus Faculty	5
Research Staff	61
Administrative Staff	9
Technical/IT Staff	11

Students:

PhD: 202	MPhil: 46
TPG: 153	UG: 247



Faculty

Faculty Profile - Regular

		Title	Research Interest
Minhua SHAO		• Head and Chair Professor • Cheong Ying Chan Professor of Energy Engineering and Environment • Director of HKUST Energy Institute • Director of Joint Laboratory for Hydrogen Energy	• Battery • Electrocatalysis • Electrochemical energy technologies • Electrochemistry • Fuel cell
Richard LAKERVELD		• Associate Head and Associate Professor	• Process system engineering • Pharmaceutical manufacturing • Crystallization • Chemical process design and optimization • Process control
Guohua CHEN		• Chair Professor	• Advanced materials • Electrochemical Engineering • Energy conservation • Environmental technologies • Drying of solids
Furong GAO		• Chair Professor • Director of Center for Polymer Processing and Systems	• Process modeling • Control and monitoring • Polymer processing
Dan LI		• Chair Professor	• Iontronics • nanofluidics and nanoionics • Graphene-based soft materials • Electrochemical energy storage and conversion • Artificial intelligence • Bioelectronic interfacing and materials
King Lun YEUNG		• Chair Professor • Director of France-HKUST Innovation Hub • Director of HKUST-AP EnviroSci Ltd Joint Laboratory on Health and Environmental Innovations • Associate Director of Environmental Central Facility	• Environmental pollution treatment • Nanoporous and nanostructured materials • Biomedical engineering
Alicia Kyoungjin AN		• Professor	• Advanced materials • Waste treatment processes • Filtration and separation
Ying CHAU		• Professor • Director of Student Innovation for Global Health Technology	• Biomedical engineering • Drug delivery • Cancer • Tissue engineering • Biomaterials • Bioengineering
Ping GAO		• Professor • Associate Director of Center for Polymer Processing and Systems	• Polymer • Polyethylene • Nanocomposites
I-Ming HSING		• Professor • Program Director of MSc in Biomolecular Engineering and Health Informatics	• Biosensors • Biomedical engineering • Microsystems • Bioengineering • Bioelectronics
Xijun HU		• Professor	• Environmental catalysis and reaction • Nanomaterials • Adsorption engineering

Faculty Profile - Regular

		Title	Research Interest
Henry H N LAM		• Professor • Associate Dean of Engineering (Undergraduate Studies)	• Bioengineering • Bioinformatics • Mass spectrometry • Metabolomics • Microbiomes and microbial communities • Proteomics
Zhengtang LUO		• Professor • Program Director of MSc in Chemical and Energy Engineering	• Advanced materials • Graphene chemistry and physics • Functional polymer
Yongli MI		• Professor	• Nanotechnology • Biotemplating preparation of nanomaterials • Polymer • Nanoparticles • Functional polymer • Bioengineering
Fei SUN		• Professor	• Bioengineering • Biopolymers • Biomaterials • Advanced materials
Yoonseob KIM		• Associate Professor • PG Programs Coordinator (Chemical and Biomolecular Engineering)	• Advanced materials • Polymer • Membrane technology • Electrochemical energy technologies
Becki Y KUANG		• Associate Professor • PG Programs Coordinator (Bioengineering)	• Synthetic biology • Biomaterials • Biomedical engineering • Bioengineering
Jiguang WANG		• Associate Professor • Padma Harilela Associate Professor of Life Science • PG Programs Coordinator (Life Science) • Co-Director of Center for Evolution and Health • Associate Director of HKUST Big Data for Bio Intelligence Laboratory	• Cancer genomics • Cancer • Bioinformatics • Bioengineering
Terence T W WONG		• Associate Professor • UG Programs Coordinator (Chemical and Biological Engineering) • Associate Director of Center for Medical Imaging and Analysis • Associate Director of Collaborative Center for Medical and Engineering Innovation	• Biomedical engineering • Bioinstrumentation • Bioengineering • Medical imaging systems • Bioimaging
Angela R H WU		• Associate Professor • UG Programs Coordinator (Life Science) • Associate Director of Center for Epigenomics Research	• Genomics • Cancer genomics • Systems biology • Microfluidics and nanofluidics • Single particle / molecule / cell studies • Bioengineering

Faculty Profile - Regular

		Title	Research Interest
Yuanyuan ZHOU		• Associate Professor • Associate Director of HKUST Energy Institute • Program Director of MSc in Materials Engineering	• Perovskite semiconductors and (opto) electronics • Multimodal characterization at high spatio-temporal resolution • High-throughput synthesis, screening, and discovery of new semiconductors
Shensheng CHEN		• Assistant Professor	• Computational science and engineering • Polymers and complex fluids • Complex coacervates and protein condensates • Charge transport • Interfacial phenomena • Artificial intelligence
Hanyu GAO		• Assistant Professor	• Chemical process design and optimization • Artificial intelligence • Polymer • Reactor engineering
Yong LAI		• Assistant Professor	• Synthetic biology • Microbiome engineering • Living therapeutics and diagnostics • Genome engineering • Functional metagenomics • Bioengineering
Hnin Yin Yin NYEIN		• Assistant Professor	• Bioelectronics • Electrochemistry • Biosensors • Wearable devices • Material science • Bioengineering
Cindy Guanyu TANG		• Assistant Professor	• Advanced materials • Polymer • Material science • Molecular electronics • Functional polymer
Yuxing YAO		• Assistant Professor	• Functional polymer • Synthetic biology • Biomolecular ultrasound • Advanced materials • Medicine and therapeutic treatment • Bioengineering
Danqing ZHU		• Assistant Professor	• Bioengineering • Computational medicine and health informatics • Protein engineering • Biomaterials

Faculty Profile - Teaching

		Title	Research Interest
Marshal YS LIU		• Senior Lecturer • Associate Professor of Engineering Education • Acting Director of Center for Engineering Education Innovation	• Bioprocess engineering • Food Processing • Engineering education
Frank L Y LAM		• Senior Lecturer • Associate Dean of Students • Assistant Professor of Engineering Education	• Environmental pollution treatment • Nanotechnology • Catalysis • Electrocatalysis
Hiddadura Isura Malinda M ABEYNAYAKE		• Lecturer II • Associate Director of Student Innovation for Global Health Technology	• Systems thinking and design • Technology and innovation management • Design and innovation • Engineering education
Darwin LINARDI		• Lecturer II	• Microbiology • Fermentation • Systems biology • Omics • Bioprocess design and optimization • Product development • Bioengineering

Faculty Profile - Research

		Title	Research Interest
Mingwei HAO		• Research Assistant Professor	• Perovskite microstructures beyond grain boundaries • Advanced multimodal characterization techniques • Innovative devices and module architectures
Zhaodong HUANG		• Research Assistant Professor	• Electrochemical energy technologies • Advanced materials • Battery
Jiawei LIU		• Research Assistant Professor	• Advanced materials • Colloid and surface chemistry • Electrocatalysis • Nanoparticles
Qiang LIU		• Research Assistant Professor	• Lithium ion batteries • Advanced materials • Nanotechnology • Surface and interface engineering
Yanbing WANG		• Research Assistant Professor	• Statistical genetics • Bioengineering

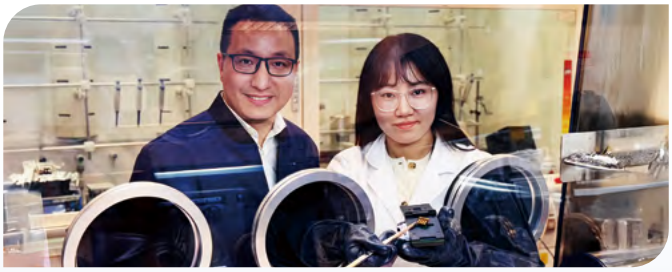
Fei XIAO		• Research Assistant Professor	• Electrochemistry • Electrocatalysis • Advanced materials • Fuel cell • Electrolyzer
Qinglan ZHAO		• Research Assistant Professor	• Electrochemical energy technologies • Electrochemistry • Electrolyzer • Battery

Faculty Profile - Emeritus

		Title	Research Interest
Chi Ming CHAN		• Professor Emeritus • Adjunct Professor, Division of Integrative Systems and Design	• Surface and interface science • Polymer blends and alloys • Conductive composite polymers • Crosslinking of polymers • Adhesion phenomena
Chi Wai HUI		• Professor Emeritus	• Energy conservation • Chemical process design and optimization • Production planning and scheduling • Site-modeling • Waste minimization
Gordon MCKAY		• Professor Emeritus	• Wastewater treatment for dyes and metals using adsorption • Ions exchange and ozonation • Biopolymers from crab and prawn shells • Processing design • Ions dioxin removal • MSW processing • Production of new adsorbents
Ka Ming NG		• Professor Emeritus	• Development of processes with multiphase reactions • separation and purification using extraction and crystallization • solids processing • Applications in manufacture of pharmaceuticals and specialty chemicals
Po Lock YUE		• Professor Emeritus	• Detoxification of hazardous waste and wastewater • Advanced oxidation and membrane separation • Waste minimization • Novel reactor engineering and applied catalysis • Artificial intelligence

Faculty **Achievements**

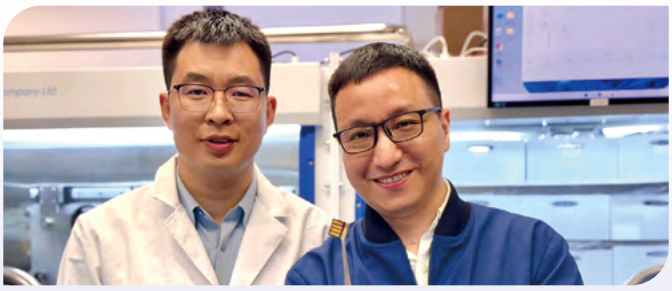
Prof. Yuanyuan ZHOU's Breakthrough in Perovskite Solar Cells



A research team led by **Professor Yuanyuan ZHOU**, Associate Professor of Chemical and Biological Engineering and Associate Director of the Energy Institute at HKUST, has achieved a breakthrough in perovskite solar cells (PSCs). By examining nanoscale properties, the team developed more efficient and durable PSCs that lower costs and broaden applications. They identified groove traps at grain junctions that disrupt cation distribution and cause instability, and through a chemical additive approach reduced trap depth, achieving efficiency near 26% with improved stability.

Prof. Zhou emphasized the importance of nanoscale analysis, while Dr. Mingwei HAO, HKUST Postdoctoral Fellow and first author, highlighted unique structural features of perovskite materials. Published in *Nature Nanotechnology*, the findings mark a step toward PSC commercialization and renewable energy advancement. Prof. Mahshid AHMADI, University of Tennessee, Knoxville, served as co-corresponding author, with collaborators from Yale, Oak Ridge National Laboratory, Yonsei University, and Hong Kong Baptist University.

Laminated Interface Boosts Perovskite Solar Cell Stability



Professor Yuanyuan ZHOU, Associate Professor in the Department of Chemical and Biological Engineering and Associate Director of the Energy Institute at HKUST, led a collaborative team with the Hong Kong Polytechnic University to design a laminated interface microstructure that improves the stability and conversion efficiency of inverted perovskite solar cells. By creating a three-ply structure composed of a molecular passivation layer, a fullerene derivative layer, and a 2D perovskite layer, the team reduced interface defects and enhanced energy alignment, resulting in more durable and efficient solar cells. Their findings, published in *Nature Synthesis*, underscore the potential of composite materials in advancing optoelectronic devices.

Prof. Angela WU **Named Schmidt Polymath**

This year, after a rigorous global selection process, eight outstanding scientists and engineers from universities worldwide were honored as Schmidt Polymaths. Organized by Schmidt Sciences, a philanthropic organization founded in 2024, the program aims to accelerate scientific knowledge and breakthroughs by supporting researchers with advanced tools and resources. **Professor Angela WU** is recognized for her pioneering work at the intersection of biology and engineering and will receive up to USD $2.5 million over five years to pursue bold, high-impact research projects that push conventional boundaries.

Bio-Inspired Strategies Advance Stability for Perovskite Solar Cells

Professor Yuanyuan ZHOU, Associate Professor in the Department of Chemical and Biological Engineering and Associate Director of the Energy Institute at HKUST, and his team have developed bio-inspired multiscale strategies to improve the long-term stability of perovskite solar cells. Drawing from natural systems, these designs enhance efficiency and resilience while addressing commercialization challenges such as mechanical fragility and environmental susceptibility. Their approach includes molecular interactions that improve crystallization, microscale self-healing mechanisms, and device-level structures that strengthen performance.

Breakthroughs feature chiral interfaces that mimic biological springs for durability and laminate-inspired microstructures that boost efficiency and stability. Dr. Tianwei DUAN, first author and Research Assistant Professor in CBE, emphasized that this represents a new approach to solar technology inspired by nature. The study, titled Bio-Inspired Multiscale Design for Perovskite Solar Cells, was published in *Nature Reviews Clean Technology* in collaboration with Yale University, École Polytechnique Fédérale de Lausanne, and Lawrence Berkeley National Laboratory.

SENG Research Excellence Awards 2024–25 and Highly Cited Honors for CBE Faculty

Professor Minhua SHAO, Cheong Ying Chan Professor of Energy Engineering and Environment, Head and Chair Professor of the Department of Chemical and Biological Engineering, and Director of the HKUST Energy Institute, has received the SENG Research Excellence Award 2024–25. He is recognized for pioneering in-situ spectroscopic techniques that advance understanding and applications in energy conversion. With over 320 publications, 37,500 citations, and an H-index of 91, he is a Fellow of the Electrochemical Society and Technical Editor of the *Journal of The Electrochemical Society*. He has also been named a Highly Cited Researcher 2025 by Clarivate, reflecting his global leadership in energy research.

Professor Hao CHEN, Assistant Professor in the Departments of Computer Science and Engineering and Chemical and Biological Engineering, as well as the Division of Life Science, has received the SENG Young Investigator Research Award 2024–25. He is recognized for innovative work in trustworthy AI for biomedicine that improves diagnostic accuracy and clinical applications. With more than 200 publications, 36,000 citations, and an H-index of 79, his AI technologies are deployed in hospitals to support diagnosis across over 30 diseases. His honors include the Asian Young Scientist Fellowship and the MICCAI Young Scientist Publication Impact Award, and he has also been named a Highly Cited Researcher 2025 by Clarivate, highlighting his growing influence in biomedical AI.

Mentorship to Global Impact: **CBE's Researchers to Rising Faculty**

Advances Perovskite Materials and Device Technologies

A group photo of Prof. Duan (bottom left) with her colleagues at HKUST.

Professor Tianwei DUAN advanced expertise in chiral perovskite materials, interface engineering, and energy related devices while working with Prof. Yuanyuan ZHOU and interdisciplinary teams. She led projects, supervised junior researchers, and secured funding, building a strong research profile. Her work on crystallization control, interfacial chemistry, and stabilization of perovskite thin films led to advances reported in *Nature Reviews Clean Technology*. She also explored functional group regulation and interface design to enhance solar cell stability, and branched into memristors with results published in *Matter*. She has since joined the Department of Materials Science and Engineering at City University of Hong Kong as an Assistant Professor, and expresses gratitude to Prof. Yuanyuan ZHOU, the department staff, and the MCPF team for their guidance and support.

From CBE to Global Impact: Prof. Guo's Perovskite Breakthroughs

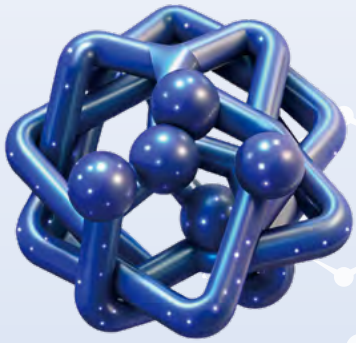
Professor Pengfei GUO, currently a Full Professor at the School of Materials Science and Engineering at Northwestern Polytechnical University, made notable contributions during his postdoctoral research at the ΣLab under Prof. Yuanyuan ZHOU. His work on perovskite solar devices included developing a bio-inspired laminated heterointerface, published in *Nature Synthesis*, which enhanced cell stability. At CBE, he also helped establish Hong Kong's first large-area perovskite module platform, achieving over 20% efficiency for 300×300 mm^2 modules. Prof. Guo expresses gratitude to his mentor and acknowledges CBE's supportive culture and facilities, noting that the recognition he has received is closely tied to the exceptional training and opportunities at HKUST.

HKUST as a **Cornerstone for Global Competitiveness**

Professor Xitang QIAN's experience at HKUST was pivotal for his successful application to the National Natural Science Fund for Excellent Young Scientists Fund Program (Overseas). As a postdoctoral researcher supervised by Prof. Minhua SHAO, he built a strong foundation in advanced carbon and two dimensional nanomaterials, achieving notable results, an international reputation, and collaboration skills that matched the program's expectations for "academic rising stars with international competitiveness." Reflecting on his journey, Prof. Qian notes, "It is no exaggeration to say that HKUST, as a fertile ground dedicated to pursuing excellence, endowed me with the confidence and capability to engage in global competition."

Building a Path to **Sustainable Energy Leadership**

Professor Qinbai YUN joined CBE in 2023 as a Research Assistant Professor under Prof. Minhua SHAO and, in 2025, became Assistant Professor in the Sustainable Energy and Environment Thrust at HKUST (Guangzhou). His research centers on low-dimensional metallic materials for electrochemical energy conversion and fine chemical electrosynthesis. At CBE, he supervised an MSc project, secured grants in Hong Kong and mainland China, and organized academic events that strengthened his leadership and network. He credits Prof. Shao's mentorship and CBE's collaborative support as instrumental in shaping his career, preparing him to advance innovative research and inspire future engineers at HKUST(GZ).



Faculty **Award**

Thetos Teaching Award Honorable Mention

Professor Frank LAM has been recognized with an Honorable Mention in the Thetos Distinguished Teaching Award 2024–25, a newly established honor founded by the Thetos Foundation as HKUST's first initiative to celebrate teaching-track faculty excellence; the Selection Committee, led by the Associate Provost (Teaching & Learning), reviewed a competitive pool to honor educators who exemplify innovation, dedication, and classroom impact. Prof. Lam's recognition reflects his exceptional commitment to student learning and innovative methods that enrich the academic experience, inspiring students and strengthening the teaching culture within the Department of Chemical and Biological Engineering.

SENtastic Staff Award 2025 Honors Inclusive Student Support

Professor Angela Ruohao WU, Associate Professor in the Department of Chemical & Biological Engineering and Division of Life Science, and Associate Director of the Center for Epigenomics Research at HKUST, has been named recipient of the SENtastic Staff Award 2025 for her exceptional dedication to supporting students' overall well-being, diverse learning needs, and special educational needs; the award celebrates faculty and staff who create inclusive, caring learning environments and promotes the sharing of best practices, with Prof. Wu recognized for her outstanding contributions in fostering a more supportive and equitable educational experience for all students.

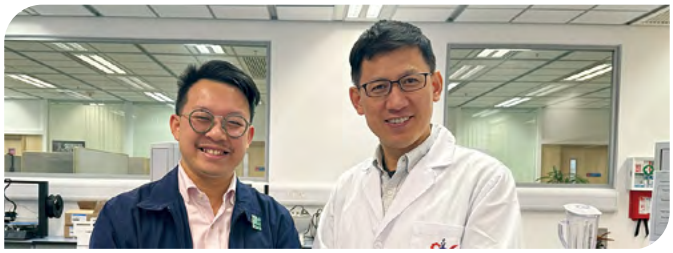
CBMS Young Innovator Award 2025 for Wearable Biosensor Breakthrough

Professor Hnin Yin Yin NYEIN, from HKUST's Department of Chemical and Biological Engineering, has been named the global recipient of the 2025 CBMS Young Innovator Award, formerly the Analytical Chemistry Young Innovator Award, for her outstanding contributions to chemical and biological microsystems; joining HKUST in 2022 after a PhD from UC Berkeley and postdoctoral training at Stanford, she leads research on bioelectronics and wearable biosensors, including a pioneering sweat sensor with integrated microfluidics for continuous molecular-level health monitoring; she will deliver an invited lecture at MicroTAS 2025 in Adelaide, Australia, where she will receive the honorarium and certificate, joining a prestigious lineage of innovators and highlighting HKUST's growing impact in microsystems engineering.

ICANX Young Scientist Award for Non-Invasive Health Monitoring

Professor Hnin Yin Yin NYEIN, from HKUST's Department of Chemical and Biological Engineering, has been selected as one of ten global recipients of the prestigious ICANX Young Scientist Award for her groundbreaking research and visionary plan to transform healthcare from reactive to proactive through non-invasive monitoring; her work converges nanomaterial engineering and smart microfluidics on flexible electronics to unlock the potential of sweat as a continuous, blood-comparable biofluid source, enabling clinical-grade, needle-free health insights seamlessly integrated into daily life and advancing equitable access to preventive care worldwide.

CBE Brews a Greener Future with TIGA MILK



A Hong Kong startup has launched TIGA MILK, a plant-based alternative made from tiger nuts, soy, and oats, targeting lactose-intolerant consumers. Featured on TVB Pearl's "A Milky Alternative" (Jan 13), it highlights innovative tiger nut processing.

Guided by **Professor Marshal LIU** and CBE students at HKUST, the product uses tiger nuts, a resilient crop needing 90% less water than traditional ones, while aiding anti-desertification efforts in China. Over 70% of Hong Kong residents are exploring plant-based options.

Prof. Liu highlighted their nutritional value: rich in fiber, vitamins, and antioxidants. TIGA MILK contains no added sugar; its natural sweetness comes from an enzymatic process, with local cafés and retailers embracing the product for its growing popularity.

This CBE-startup collaboration demonstrates how academic expertise can drive real-world innovation, and with the plant-based milk market projected to exceed HK$1 billion by 2025, TIGA MILK sets a strong example of health-conscious, sustainable development.

Faculty **Promotion**

Promotion to Associate Professor **Prof. Yoonseob KIM**

Professor Yoonseob KIM has been promoted to Associate Professor in the Department of Chemical and Biological Engineering effective 1 July 2025, in recognition of his outstanding contributions in research, teaching, and service; since joining HKUST, he has published 36 high-impact papers in top journals including *JACS, Angew. Chem., and Adv. Materials,* secured multiple competitive grants (1 ECS, 2 GRF, 1 CRF, and 1 ITF), and expressed gratitude for the department's support in building his independent research program while pledging continued dedication to CBE's mission.

Promotion to Chair Professor **Prof. King Lun YEUNG**

Professor King Lun YEUNG has been promoted to Chair Professor effective 1 July 2025, recognizing his groundbreaking technical advancements, successful grant acquisitions, and exceptional leadership in the Department of Chemical and Biological Engineering; he recently secured a GTF project on Carbon-Negative, Green, Circular Technology for FOG waste revalorization and ITF funding for COVID-19 innovations, while earning the 2020 Chief Executive's Commendation for Community Service, recognition at the 3rd HKUST Faculty Recognition Ceremony, and eight medals (four Gold, four Silver) at the Geneva International Exhibition of Inventions since 2018.

New Faculty 2025

Prof. **Yuxing YAO**

Prof. Yuxing Yao to CBE – Engineering a Future of Non-invasive Medicine

The Department of Chemical and Biological Engineering is delighted to welcome **Prof. Yuxing YAO**, who joined HKUST as Assistant Professor in January 2025. Trained across materials chemistry, ultrasound technology, and synthetic biology, Prof. Yao's interdisciplinary research aims to build technologies that can act inside the body, precisely and non-invasively, for next-generation therapeutics without a scalpel.

Prof. Yao earned his BS in Chemistry and Biology from Tsinghua University, PhD in Materials Chemistry from Harvard University and completed postdoctoral training at California Institute of Technology, where he advanced research in non-invasively controlled chemical and mechanical actuations. At Harvard, he pioneered soft, responsive materials for miniaturized robotics; at Caltech, he developed biocompatible ultrasound-triggered chemistry for targeted cellular manipulation. His research work has been published in top journals including *Science, PNAS, Science Advances, Advanced Materials,* etc.

Yuxing has been recognised as Foresight Institute Distinguished Student Award (2019), DSM Science & Technology Award Finalist (2018), Certificate of Teaching Excellence at Harvard (2015). His research has won funding from Caltech Resnick Sustainability Institute (2020) and Hong Kong's Research Grants Council Early Career Scheme (2025).

Beyond the bench, he mentors students through the "Exploration First" philosophy. As Prof. Yao hinted that try ten directions; nine will teach you who you are not, one will reveal who you are meant to become. It's a spirit of curiosity and rigor that aligns perfectly with CBE's ambitions for impact at the interface of engineering and medicine.

Prof. **Guohua CHEN**

Advancing Electrochemical Technologies for a Sustainable Future

Professor Guohua CHEN rejoined the Department of Chemical and Biological Engineering (CBE) at The Hong Kong University of Science and Technology as Chair Professor in July 2025, returning to his academic home after a break in other local institutions. A globally recognized authority in electrochemical energy storage and environmental technologies, he is spearheading the Energy Conversion and Storage Laboratory.

Prof. Chen received his BEng in Chemical Engineering from Dalian University of Technology in 1984, PhD in Chemical Engineering from McGill University in 1994 and has since built a distinguished career in advanced materials, battery electrochemistry, and drying of high-value materials, with a strong emphasis on sustainable processes and scalable solutions.

With over 30 years of R&D leadership, Prof. Chen has authored more than 370 peer reviewed papers, garnering over 41,000 Google Scholar citations and an h-index of 110. He holds three US patents and a dozen of Chinese patents. His breakthroughs in lithium-ion batteries and supercapacitors, have solutions for high-energy density and safe batteries for electric vehicles and energy storage for a sustainable society.

Honors include the inaugural HKUST School of Engineering Research Excellence Award, PolyU Merit Award for Individual Research, and Fellowships in the Canadian Academy of Engineering, Hong Kong Academy of Engineering, AIChE, HKIE, and Global Academy of Chinese Chemical Engineers. Prof. Chen chaired the 17th Asian-Pacific Confederation of Chemical Engineering, the 22nd International Meeting on Lithium Batteries, leads the World Chemical Engineering Council, and serves as Deputy Director of China's CIESC.

Prof. Chen is Editor-in-Chief of *Process Safety and Environmental Protection*, and serves as an Editor of *Separation and Purification Technology*, on editorial boards of *Batteries*, and other leading journals. At HKUST, he continues advancing electrochemical technologies, including advanced electrode materials for lithium-ion batteries for electric vehicles or eVTOLs and next generation energy storage devices such as Li-S batteries. His homecoming would contribute to CBE's push towards carbon-neutral energy solutions.

Research

Research Achievements

Prof. Minhua SHAO Champions Clean Energy and Inspires the Next Generation

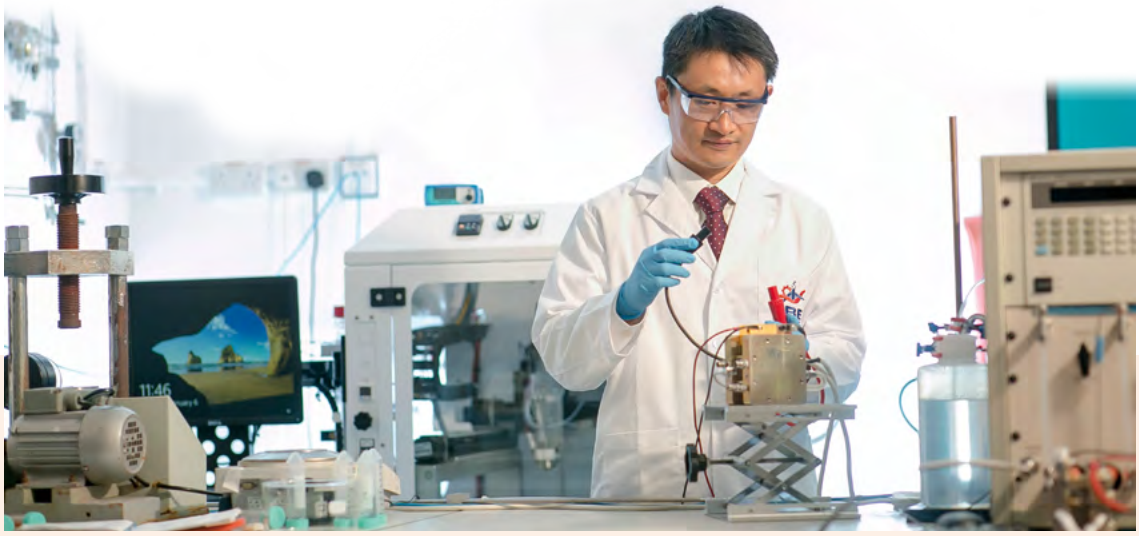
Professor Minhua SHAO, pioneering electrochemist and Head of the Department of Chemical and Biological Engineering, is accelerating the clean energy transition while empowering faculty and students to contribute to a resource-friendly world. As Director of the HKUST Energy Institute and Cheong Ying Chan Professor of Energy Engineering and Environment, he makes the vast challenge of sustainability feel achievable: "The big picture is certainly really, really big. But I just try to do what I can and what I'm good at. If I can contribute a little bit, then I'm proud of this."

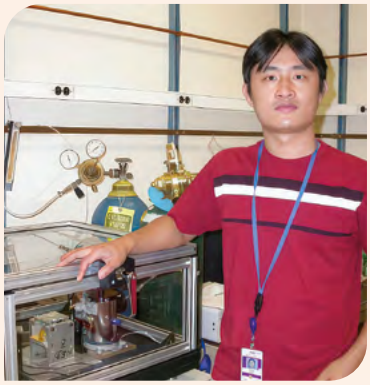
His research is advancing hydrogen fuel cells and solid-state lithium batteries with energy densities over 400 Wh/kg, supporting cleaner transportation and the rise of electric vertical takeoff and landing (eVTOL) aircraft. Since becoming Department Head in 2023, he has recruited nine faculty members, launched outreach workshops, and prepared the new BEng in Energy and Environmental Engineering, debuting in 2025–26.

"Most of us now care about the environment and renewables," he notes. "And after graduation, there are job opportunities there."

Prof. Shao's career reflects a philosophy of seizing opportunities and giving his best. After studying chemistry and electrochemistry at Xiamen University, he pursued a PhD at SUNY Stony Brook, later transferring to Brookhaven National Laboratory to explore electrocatalysis at the dawn of the hydrogen economy. He then joined UTC Power, where he led a major collaboration with Toyota and became the fastest promoted engineer in company history, before gaining further industry experience at Ford. In 2014, he moved to HKUST, seeking academic freedom to pursue his ideas.

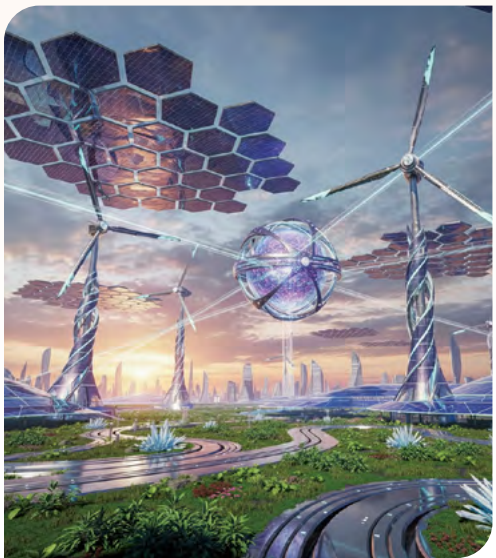
Since then, he has risen to Chair Professor and Director of the Energy Institute, earned recognition for teaching and research, and was elected a Fellow of





the Electrochemical Society in 2023. He also founded Guangzhou Padergy New Energy Co Ltd, a fuel cell catalyst start-up, and is planning a second venture in batteries. Despite his packed schedule, including raising two daughters, he still finds time for marathons and competitive sports. "Sport is sometimes competitive, so any achievement or improvement gives you joy," he says.

Looking ahead, Prof. Shao sees promising signs of cleaner energy in Hong Kong, from hydrogen-powered buses to electric ferries. At HKUST, he supports the University's Net-Zero Action Plan 2045 and believes global efforts like the UN Sustainable Development Goals provide a valuable framework. "Whether we can achieve this, I cannot tell," he reflects. "But there's progress."



CBE Faculty Lead Advanced Materials Special Issue on Materials Science Breakthroughs

The Department of Chemical and Biological Engineering (CBE) at HKUST proudly celebrates **Professor Minhua SHAO, Professor Zhiyong FAN**, and **Professor Yoonseob KIM** as guest editors of the special issue "35th Anniversary of Materials Research at the Hong Kong University of Science and Technology" (*Advanced Materials,* Volume 37, Issue 23, 2025), showcasing cutting-edge advancements in nanomaterials, next-generation energy storage, and sustainable technologies that address global challenges in renewable energy and eco-friendly materials; supported by the HKUST Provost's Office, this landmark collection unites leading researchers, inspires future innovation, and invites the community to explore the full issue online in celebration of three decades of materials science excellence at HKUST.

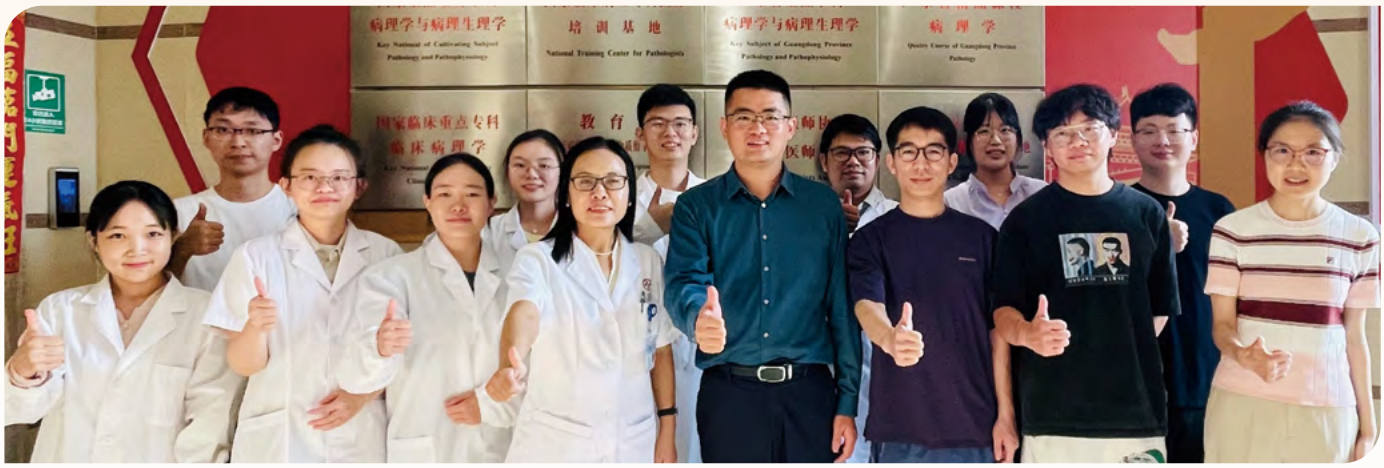
HKUST's SmartCare AI Shifts Focus to Patient-Centered Care

Professor Hao CHEN, Assistant Professor in Computer Science and Engineering, Chemical and Biological Engineering, and Division of Life Science at HKUST and Director of Smart Lab, has launched SmartCare, a transformative AI platform built on the MedDr multimodal foundation model, at the university's on-campus clinic through a six-month pilot open to over 15,000 students, faculty, and staff; featuring intelligent pre-visit triage, an AI-powered consultation assistant with multilingual live transcription, and automation of over 30 medical documents, SmartCare streamlines workflows, reduces administrative tasks, and enhances patient-provider interactions to enable personalized care, with Prof. Chen highlighting its advanced query handling, Dr. Justin CHENG (CEO) emphasizing reduced paperwork for stronger patient connections, and Prof. Samuel Chung-Toi YU praising the translation of research into real-world healthcare solutions, while a new partnership integrates PanopticAI's monitoring technology to boost efficiency at an upcoming ambulatory care center.

HKUST's MOME AI Model Enters Hospital Trials for Breast Cancer Diagnosis

Professor Hao CHEN, Assistant Professor in Computer Science and Engineering, Chemical and Biological Engineering, and Division of Life Science at HKUST, leads the development of Mixture of Modality Experts (MOME), a large AI model trained on China's largest multiparametric MRI dataset that delivers expert-level accuracy in classifying breast tumor malignancy, matching experienced radiologists, while supporting molecular subtyping, predicting treatment responses, and reducing unnecessary biopsies; currently under clinical validation in over ten hospitals, MOME integrates diverse imaging modalities with strong adaptability and interpretability, as highlighted in the *Nature Communications* study co-authored with Harvard University, Shenzhen People's Hospital, PLA General Hospital, and Yunnan Cancer Center.

HKUST AI System: SmartPath for Cancer Diagnosis



A research team led by Professor Hao CHEN, Director of the Collaboration Center for Medical and Engineering Innovation and Assistant Professor in the Departments of Computer Science and Engineering and Chemical and Biological Engineering, has launched SmartPath—an advanced AI system at HKUST that streamlines pathology workflows with integrated support for clinical diagnosis, biomarker quantification, and treatment response assessment across cancers; trained on over half a million pathology images, it excels in diagnosing lung and breast cancers with over 95% accuracy in ongoing clinical trials, enabling personalized treatment plans while expanding to more cancer types, with key findings published in *Nature Biomedical Engineering*.

Big Grants

RGC Announces Collaborative Research Fund (CRF) 2024/25 Results

Professor Jiguang WANG, Padma Harilela Associate Professor of Life Science (Division of Life Science and Department of Chemical and Biological Engineering), is a recipient of the Collaborative Research Project Grant (CRPG) under the Collaborative Research Fund (CRF) 2024/25.

Led by Prof. Wang, with HKUST co-investigators Prof. Shuhuai YAO (Mechanical and Aerospace Engineering and CBE), Prof. Kai LIU, and Prof. Can YANG (Department of Mathematics), their project titled "Characterization and Molecular Mechanisms of IDH Mutant Mesenchymal Glioma: Implications for Diagnosis and Targeted Therapies", has received HKD 6 million from RGC. The project will run from 30 June 2025 to 29 June 2028, marking a significant step forward in glioma research.

The CRF supports multi-investigator, multi-disciplinary projects in order to encourage more research groups to engage in innovative and high-quality cross-disciplinary/cross-institutional collaborations.

Prof. Bonnie ZHU Advances AI-Driven Gene Therapy with RAISe+ Recognition

Professor Bonnie ZHU, Assistant Professor in the Department of Chemical and Biological Engineering at HKUST, has been named one of seven awardees in the second round of the Research, Academic, and Industry Sectors One-plus Scheme (RAISe+ Scheme) for her project titled "Developing tissue/cell specific AAV capsids by AI- and data-driven approaches." Her work leverages artificial intelligence to enhance gene delivery systems, with potential applications in precision medicine.

HKUST secured the highest number of funded projects among local institutions in this round, spanning health and medical sciences, AI and robotics, advanced manufacturing, and electrical and electronic engineering. The RAISe+ Scheme, launched in 2023, supports university research with strong potential for commercialization and societal impact.

Prof. Tim CHENG, Vice-President for Research and Development, stated:
"HKUST is proud to lead this round with the most funded projects. This reflects our commitment to research excellence and knowledge transfer. The government's support accelerates commercialization and fosters interdisciplinary collaboration for real-world solutions."

Launched in 2023, the RAISe+ Scheme supports university teams with strong potential to generate social impact and market value. Applicants must demonstrate excellence in commercial viability and relevance to public policy and community needs. Last year, five HKUST teams received RAISe+ awards, helping translate research breakthroughs into real-world solutions across industry and academia.

Pioneering Brain-Machine Interfaces for Neural Restoration

Professor Yiwen WANG, Associate Professor in Electronic & Computer Engineering and Chemical & Biological Engineering at HKUST, leads transformative brain-machine interface (BMI) research to restore motor functions in paralyzed patients, having secured over HK$7.5 million for next-generation adaptive systems; her journey, from dismantling bicycles as a mathematically gifted child, through a PhD at the University of Florida, to witnessing a patient control a robotic arm in 2012, fuels her mission, while as IEEE EMBC 2024 keynote speaker and EMBS Distinguished Lecturer, she mentors students to prioritize impactful, long-term research over quick publications, envisioning BMIs that address cognitive and neurodegenerative disorders in aging societies, underscoring the need for engineering solutions to maintain brain health as societies age, and exemplifying the intersection of technical skill, interdisciplinary collaboration, and empathy in modern neural engineering.

Education

Undergraduate Programs

(Jupas code: JS5220)

Bachelor of Engineering in Chemical Engineering (CENG)

Chemical engineers design immensely complex processes to transform raw materials into valuable products that we use in our everyday life. They also work at the smallest scale to develop materials. Equipped with a solid foundation in the molecular sciences and the quantitative skills and systems thinking of engineers, chemical engineers are versatile professionals needed in every major industry.

Bachelor of Engineering in Bioengineering (BIEN)

Bioengineering bridges the life sciences and engineering. The interdisciplinary training of bioengineers enables them to analyse and harness biological processes to develop products such as biomedical devices, biomolecules, and pharmaceuticals. Furthermore, they often join forces with scientists and medical professionals to decipher living systems and develop treatment for diseases.

Bachelor of Engineering in Energy and Environmental Engineering (EEEN)

The sustainable production and use of energy, and the protection of the environment are among the greatest challenges of our time. Energy and environmental engineers design and implement engineering solutions to provide energy to sustain modern societies while minimizing the impact on our environment. Their expertise is also needed in various industries including energy storage and conversion, energy-intensive manufacturing, waste management, pollution control, and environmental impact assessment.

Department-Based Admissions

Starting from 2025 admission, HKUST School of Engineering will implement a dual-track admission that will offer students two entry options: school-based and department-based. Students with strong preference to pursue our undergraduate programs could choose Department-based Admissions. By allowing direct admission to Department of Chemical and Biological Engineering, CBE aims to provide clear academic pathways and flexible study progress for students.

JS5220_Jupas 2026 (Department-based)

JS5282_Jupas 2026 (School-based)

JS5220 Department of Chemical and Biological Engineering

	Highest Attainable Scores	Median	Lower Quartile	
2025	75.86	41.49	39.59	Weighted Score calculated based on 2025 program-specific formulae (Best 5 subjects + 6th subject bonus)
2026	89.25	47	44	Simulated Scores (Best 5 subjects + Best 6th subject bonus)

	School / Program-specific Subjects Requirement	Score Formulae (Best 5 Subjects)
2025	One of: Biology / Chemistry / Physics / Information and Communication Technology*	English x2 + Math x2 + Best from Biology / Chemistry / Physics / ICT# + Best 2 other subjects^: #Weighting: Biology / Chemistry / Physics (x2), ICT (x1) ^Weighting: M1 / M2 (x1.5), other subjects (x1) *Combined Science can also be considered a science subject, which carries a weighting of x2
2026	One of: Biology / Chemistry / Physics / Information and Communication Technology	English x2 + Math x2 + Best from Biology / Chemistry / Physics / ICT# + Best 2 other subjects^: #Weighting: Biology / Chemistry / Physics (x2), ICT (x1.5) ^Weighting: Biology / Chemistry / M1 / M2 (x2), other subjects (x1)

Research Postgraduate Programs

Master of Philosophy and Doctor of Philosophy Programs in Bioengineering

The Master of Philosophy (MPhil) and Doctor of Philosophy (PhD) Programs in Bioengineering integrate biological, physical, and computational sciences with engineering principles to analyze and/or design biological processes. Using a systematic and quantitative approach, these programs prepare students to advance the biomedical industry, optimize bioprocesses, and develop new biomedical technologies. The programs are managed by the Department of Chemical and Biological Engineering.

For the MPhil degree, candidates are expected to demonstrate expertise in their discipline, generate new knowledge, and contribute meaningfully to the field.

For the PhD degree, candidates are expected to achieve mastery of their discipline, generate new knowledge, and make an original, substantial scholarly contribution.

Master of Philosophy and Doctor of Philosophy Programs in Chemical and Biomolecular Engineering

The Master of Philosophy (MPhil) Program strengthens students' fundamental knowledge in Chemical Engineering, with specializations in chemical processing, materials, environment, energy and bioengineering. Students will engage with key challenges in scientific research, technological development and commercial applications within the field. Candidates are expected to demonstrate disciplinary expertise, generate new knowledge, and contribute meaningfully to the field.

The Doctor of Philosophy (PhD) Program equips students with the skills to identify critical research challenges in Chemical Engineering, design original research plans, and develop innovative solutions. Candidates must exhibit mastery of their discipline, generate new knowledge, and make an original, substantial contribution to the field.

Taught Postgraduate Programs

Master of Science Program in Biomolecular Engineering and Health Informatics (MSc BEHI)

Program Overview

The program equips students with the knowledge and skills in biomolecular engineering and data analytics so that students will be uniquely prepared for career opportunities in local and regional industries in pharmaceuticals, biomedical devices, diagnostics, biotechnology, and healthcare in general. Furthermore, the program stimulates curiosity and interest in emerging fields, which can provide a foundation for research initiatives and entrepreneurship.

Website: https://seng.hkust.edu.hk/msc/behi

Master of Science in Chemical and Energy Engineering (MSc CEE)

Program Overview

This program is designed for students who wish to acquire an in-depth understanding of a particular area of chemical and energy engineering while strengthening their overall knowledge at an advanced level. It provides students with updated knowledge on chemical process principles, energy harvesting technology, energy storage devices, energy conversion techniques, and power plant technology.

Upon completion of this program, graduates could continue with postgraduate programs or work in chemical firms, electric vehicle manufacturers, renewable energy companies, etc.

Website: https://seng.hkust.edu.hk/msc/cee

Master of Science in Materials Engineering (MSc MATE)

Program Overview

The program aims to cultivate next-generation materials engineers based on the substantial education and research infrastructure on advanced materials, a core area of HKUST that has earned a global reputation. It also leverages the university's strengths in artificial intelligence and soft matter, preparing students with integrated, updated materials-engineering training for career opportunities in broad industries.

Upon completion of this program, graduates could continue with postgraduate programs or work as materials engineers, quality control engineers, etc.

Website: https://seng.hkust.edu.hk/msc/mate

Departmental Academic Events

CBE's Successful Department Reception in Boston at AIChE Annual Meeting 2025

The Department of Chemical and Biological Engineering held its second department reception on Monday, November 3rd, during the 2025 Annual Meeting of the American Institute of Chemical Engineers in Boston. This premier educational forum brought together chemical engineering researchers and professionals from around the globe to explore innovations and professional development opportunities. The reception offered the department a rich opportunity to engage directly with promising faculty candidates, whose fresh perspectives and expertise contributed valuable dialogue that informed and enriched CBE's recruitment efforts. Researchers and practitioners across career stages converged to exchange pioneering ideas, engage diverse audiences, and cultivate meaningful connections. Beyond fostering academic discussions and networking, the reception played a crucial role in identifying and recruiting outstanding talent poised to shape the future of chemical engineering.

Alongside recruitment efforts, the reception also created a welcoming space for students, alumni, faculty, and industry partners to engage in lively conversations. Attendees exchanged ideas, shared experiences, and reconnected on their professional and academic journeys. These informal interactions fostered a strong sense of community and collaboration, opening doors to partnerships, mentorship opportunities, and future directions in the field. As guests enjoyed refreshments, the event encouraged dialogue that deepened connections and enriched the collective spirit of the department. This gathering exemplified the supportive and interactive environment that defines the CBE academic community, setting the stage for continued engagement and collaboration in the future.

CBE colloquium 2025

Spring 2025

7 Feb 2025 — Extending Spectral Library Search Strategies to Explore the Human Proteome
Prof. Wenguang SHAO
Shanghai Jiaotong University

14 Feb 2025 — Chiroptical Probes to Track Spin & Light Polarization in Space & Time in Emerging Semiconductors
Prof. Sascha FELDMANN
Ecole Polytechnique Federale de Lausanne (EPFL)

21 Feb 2025 — Open-Air Spray-Plasma Manufacturing of Large-Area Perovskite Solar Cells and Modules
Prof. Reinhold DAUSKARDT
Stanford University

28 Feb 2025 — Visualisation of Chemical Reactions with X-ray Spectroscopy
Prof. Feng Ryan WANG
University College London

7 Mar 2025 — Biomedical Sensors for Precision Diagnostics
Prof. Ali K. YETISEN
Imperial College London

14 Mar 2025 — Lightning Phases and Surfaces: Intracellular Electrochemistry Powered by Phase Transition
Prof. Yifan DAI
Washington University at St. Louis

21 Mar 2025 — Molecular Mechanism of Enzyme-Catalyzed Pericyclic Reactions
Prof. Jiahai ZHOU
Nanjing Normal University

28 Mar 2025 — Multiscale Dynamic Phase Transformations in Batteries and Electrocatalysis
Prof. Jongwoo LIM
Seoul National University

11 Apr 2025 — Molecular Measurement Technologies for Understanding Immune Responses
Prof. Jianbin WANG
Tsinghua University

25 Apr 2025 — Tracking and Making Use of Heat in Two-dimensional Metal Halide Perovskites
Prof. Peijun GUO
Yale University

2 May 2025 — The Growth of 2D Semiconductor and Its Multi-dimensional Photodetection
Prof. Zegao WANG
Sichuan University

9 May 2025 — Semiconducting Polymers for Soft Bioelectronics
Prof. Ting LEI
Peking University

Fall 2025

5 Sep 2025 — Covalent Organic Frameworks as Promising Platforms for Diverse Applications
Prof. Qichun ZHANG
City University of Hong Kong

12 Sep 2025 — Exploration of High-Performance and Low Cost Organic Photovoltaic Materials
Prof. Chunhui DUAN
South China University of Technology

19 Sep 2025 — Catalysis: Advancing Affordable and Clean Energy
Prof. Yong WANG
Washington State University

26 Sep 2025 — Pure-water-fed Electrocatalytic CO_2 Reduction to Valuable Chemicals
Prof. Shu Ping LAU
The Hong Kong Polytechnic University

3 Oct 2025 — Advancing Cardiac Tissue Engineering using iPSC and Bioprinting Technologies
Prof. Soah LEE
Sungkyunkwan University

10 Oct 2025 — Low-Power 2D CMOS and Optoelectronic Devices via Oxidation Treatment of Tungsten Diselenide
Prof. Luke SMITH
Cheng Kung University

17 Oct 2025 — Recent Progress on Perovskite-based Photovoltaics
Prof. Rui WANG
Westlake University

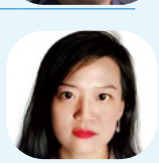
24 Oct 2025 — Programmable RNA/RNP Switches for Cell-Specific Gene Control and Next-Generation
Prof. Hirohide SAITO
University of Tokyo

31 Oct 2025 — AI for Electroplating: Data-Driven Control of Interfaces and Functional Surfaces
Prof. Cheng WANG
Xiamen University

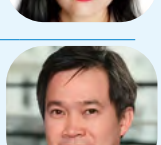
07 Nov 2025 — Targeting PARP Biology Beyond Cancer: Biomolecular Condensates, Infection, and Neurodegeneration
Prof. Anthony LEUNG
Johns Hopkins University

14 Nov 2025 — The Ins and Outs of Intratumor Bacteria in Breast Cancer Malignancy
Prof. Shang CAI
Westlake University

21 Nov 2025 — Advanced Flow Conformance via Mechanically Robust Hydrogel Particles in High-Salinity Porous Media
Prof. Liyuan ZHANG
The China University of Petroleum (East China)



28 Nov 2025 — BioCrystallisation: Challenges and Opportunities in Protein and Peptide Purification
Prof. Jerry HENG
Imperial College London



HKUST CBE & Fuzhou University Forge Stronger Ties in Joint Forum

A Milestone Academic Exchange

On October 25, 2024, HKUST's Department of Chemical and Biological Engineering (CBE) co-hosted the **HKUST–Fuzhou University Joint Forum on Chemical Engineering and Technology**. The event united faculty, researchers, and students from both institutions to strengthen collaboration and explore new frontiers in chemical and biological engineering.

Opening Sparks: Shared Vision

Prof. Minhua SHAO, Head of CBE, welcomed participants with a call for deeper international partnerships. Fuzhou University leaders, including Party Secretary Prof. Guolong CHEN, echoed this vision, while Academician Prof. Jiannian YAO of the Chinese Academy of Sciences inspired attendees with his keynote on interdisciplinary futures.

Ideas in Motion: Research Exchange

Faculty from both universities presented work on sustainable energy, advanced materials, catalysis, and biotechnology. Highlights included HKUST's Prof. Jean-Marie TARASCON on real-time battery sensing, Prof. Zhengtang LUO on 2D materials, and Prof. Fei SUN on engineering biology. Fuzhou University was represented by senior faculty such as Prof. Xinchen WANG and Prof. Lilong JIANG, alongside colleagues in chemistry and materials science. These sessions showcased innovation and opened doors for joint projects.

Bridges Built: Future Collaboration

Beyond academic exchange, the forum fostered networking and dialogue among faculty and students. By combining expertise and vision, HKUST and Fuzhou University reaffirmed their commitment to advancing interdisciplinary research and education, creating pathways for innovation across chemical and biological engineering.

CBE Connects Alumni and Industry Partners: **Forging Pathways in Sustainable Innovation at I-Connect-U**

A Vibrant Gathering at HKUST

On March 28, 2025, the Department of Chemical and Biological Engineering (CBE) at HKUST hosted the **I-Connect-U** Forum on "Innovative Solutions for Sustainable Energy, Materials, and Environment." Welcoming nearly 100 participants, including alumni, faculty, students, and industry leaders, the event underscored CBE's commitment to collaborative innovation and sustainable development.

Warm Welcome & Department Overview

Prof. George YUAN, Associate Dean of Engineering (Strategic Planning and Development), opened with reflections on the value of industry-academia collaboration. Prof. Minhua SHAO, Head of CBE, followed with an overview of the department's research strengths, educational programs, and entrepreneurial ventures.

Highlights from the Day: Keynote Perspectives and Fireside Chat

Dr. Jiadong GONG, Vice President and CTO of CATL International R&D Institute, shared how AI is transforming sustainable energy and materials. Mr. Eddie LEE, Principal Environmental Protection Officer at the HKSAR Government and a graduate of CBE's inaugural BEng cohort, discussed innovative approaches to air quality management. A fireside chat moderated by Prof. Shao brought together leaders from BASF, ExxonMobil, Templewater, and King Stone Energy Group, alongside Dr. Gong and Mr. Lee, to explore emerging technologies and sustainability strategies.

Innovation in Action: Behind the Scenes Lab Tours

Guests toured the Food Technology Lab and the CIAC-HKUST Joint Laboratory for Hydrogen Energy, followed by a research showcase featuring projects such as sugar-free craft beer, solar-driven energy systems, and advanced battery technologies. These demonstrations highlighted how academic breakthroughs can be translated into real-world solutions.

Building Connections for the Future

The I-Connect-U Forum fostered meaningful dialogue and new ties among alumni, faculty, and industry partners. By spotlighting both research excellence and collaborative opportunities, the event reinforced CBE's mission to connect people, ideas, and technologies for a sustainable future.

Info Day 2025

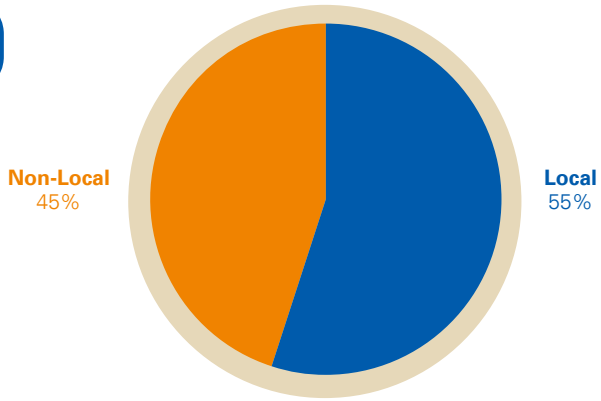
Students

Student Achievements – Admission

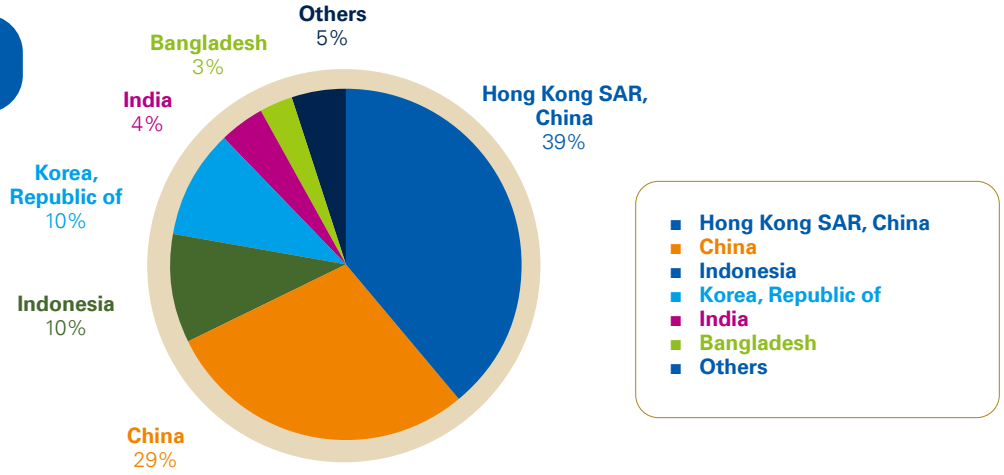
Rising Standards, Broader Horizons

Admissions quality has risen markedly this year, with the JUPAS median climbing from 41.49 in 2025 to 47 in 2026 and the lower quartile improving from 39.59 to 44, clear evidence of stronger academic preparation among incoming students. The number of admitted Year 1 undergraduates also increased, reflecting the success of department-based admissions in attracting more talent. This new pathway has also enhanced diversity and gender balance, with non-local students now making up 45% of the cohort, and women comprising 44% of the class, together creating a vibrant and inclusive learning community.

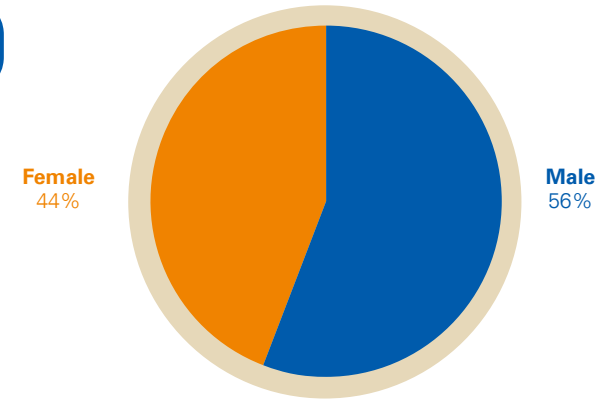
CBE UG Year 1 students
(Local/non-local)



CBE UG Year 1 students
(Citizenship)



CBE UG Year 1 students
(Gender)



CBE PhD Student Guimei LIU Awarded 2025 Steven Ying Research Prize

Ms. Guimei LIU, a Year 4 PhD student in HKUST's Department of Chemical and Biological Engineering (CBE), has been named one of two recipients of the prestigious **2025 Steven Ying PhD Research Prize**, receiving a HK$50,000 award for her outstanding research on **advanced electrocatalysts for sustainable hydrogen production**; selected from 23 applicants alongside Mr. Chen ZHAO of Ocean Science, she was honored on 6 June 2025 by Mr. Steven YING, Director of the Foundation for Amazing Potentials, and Prof. Minhua SHAO, Director of the HKUST Energy Institute and CBE Head, who praised the donation's role in advancing green innovation and global exchange, while the awardees presented their work under supervisors Prof. Ding HE and Prof. Shao and expressed gratitude to their mentors and the Institute.

CBE Student Malvin Subroto Wins First Prize in **11th HK University Innovation Competition**

Malvin Subroto PAMUDJI (CBE) and **Steven Ka Kit CHENG** (ENVR), under the guidance of Professor King Lun YEUNG, have clinched **First Prize in the Entrepreneurship Track (Start-up category)** at the **11th Hong Kong University Student Innovation and Entrepreneurship Competition** with their groundbreaking project *"Low Carbon Lifestyle with Silica Capsule Technology,"* which revolutionizes active ingredient delivery in human and pet hygiene products to boost efficacy while slashing environmental impact; presented at the May 31, 2025 ceremony amid a record 2,033 participants and 687 projects, the duo has since earned an invitation to the **China International University Innovation Competition 2025** this October, following their **Grand Prize and Gold Medal** at World Invention Singapore 2025 (representing Hong Kong), alongside accolades from Geneva, Asia Universities Alliance, WeStart Shanghai 2024, and the Rosewood Foundation.

Internship
CBE Summer Study Tour at Towngas Methanol Plant

During June 1-8, 2025, CBE organized a one-week summer study tour to a leading chemical plant, offering students valuable hands-on industry exposure. With the generous support of Towngas, 19 students had the unique opportunity to visit its subsidiary in Inner Mongolia, where coal liquefaction is used to produce 300,000 tons of methanol annually.

The plant features several key units, including air separation, coal gasification, methanol synthesis and purification, as well as utilities, instrumentation, and equipment maintenance. During the tour, students were divided into three groups. Each group began with a thorough introduction to the plant's process flow chart, followed by guided visits to the actual processes and equipment on site. This immersive experience provided students with a comprehensive understanding of large-scale methanol production and the application of advanced chemical engineering technologies in industry.

To complement the technical learning, students also had the opportunity to explore the scenic Yellow River and nearby desert, adding a memorable and enriching dimension to the trip.

CBE Summer Study Tour 2025: Fueling Futures in Inner Mongolia

Through CBE's strong commitment to student development and the generous support of Towngas, 19 students, led by dedicated faculty, gained exclusive access to one of China's most advanced green methanol mega-plants in Ordos, Inner Mongolia in June 2025. Aaron **WONG** and Eagle **TSANG**'s reflections below capture the profound technical depth and lasting personal inspiration of this extraordinary study tour.

From Textbook to Reality

Students rotated through plant units such as air separation, coal gasification, methanol synthesis, purification, and equipment maintenance. Aaron described safety training and daily tours of coal-burning sections, distillation units, and control rooms alive with real-time data. His team also explored non-operating areas and the power department, where engineers showed how efficiency, sustainability, and innovation intersect. Eagle noted how textbook diagrams of reactors *"finally came to life"* during visits to gasification and air separation units, highlighting the value of seeing theory applied at scale.

Engineers Teaching Future Engineers

The plant's "waste-to-energy" mission left a strong impression. Students learned how Towngas converts waste, from agricultural residue to scrap tires, into clean, versatile fuel, aligning with China's carbon-reduction goals. For many, this was more than a factory tour; it was a glimpse into the future of sustainable energy and their own potential careers.

Personal Growth: Desert Adventure & Mongolian Magic

Beyond the technical lessons, the group unwound at the breathtaking XiangShaWan (Whispering Sands) Desert. Camel rides, high-speed sand sledding, a spectacular Mongolian cultural show, and a traditional yurt banquet provided the perfect celebration, complemented by glimpses of the majestic Yellow River. These experiences deepened friendships and broadened perspectives, blending professional growth with cultural appreciation.

More Than Knowledge: Lifelong Inspiration

Both Aaron and Eagle emphasized how the trip reignited passion for chemical engineering and strengthened bonds among peers. Thanks to the Department's unwavering support, the study tour became more than an internship, it was a story of growth, discovery, and inspiration that will shape their journeys ahead.

Chem-E Car 2025 Voice from the Team: Innovation Through Challenge and Support

From left to right: Prof. LUO, TANG Tsun Ting (Jason), CHEN Zihao (Mose), YAU Yuet (Joyce), ZISENGWE Vimbai Norraine (Vimbai), LIYANARACHCHI Pasindu Nikil (Nikil), CHAN Wing Yiu (Abbie)

In chemical engineering, theory meets reality, and for the 2025 CBE Chem-E Car Team, the global competition became a masterclass in turning challenges into growth, supported by our faculty and program. We are a team of eight local and international students who built a car powered by chemical reactions, transforming coursework into real-world innovation. Car modelling anchored the project, while repeated 3D printing setbacks drove sharper problem-solving. Members balanced lab and remote work, navigated cultural differences, and embraced collaborative leadership. With clear roles from propulsion specialists to electronics engineers, and strong communication, our team showed how the department cultivates leaders for a global environment.

Departmental Support: The Backbone of Innovation

Our success stemmed from the department's commitment to student growth. Faculty mentors guided us on chemical reaction safety, including hydrogen emission work, and on project management, ensuring concepts like thermodynamics and materials science were applied to real challenges. When a safety inspection revealed design gaps, we drew on departmental resources to reengineer a secondary power source overnight, meeting competition standards and showcasing our resilience through the program's emphasis on hands-on learning.

Global Competition: Expanding Horizons and Opportunities

At the global competition, our team tested our car and broadened our worldview through exchanges with peers from Asia and beyond. We saw groundbreaking designs, creative outreach like mini documentaries, and opportunities that reinforced a global outlook. The event also opened doors to graduate networks and industry connections, including alumni at MIT, underscoring how the program links academic excellence with professional growth.

Beyond the Podium: Lasting Benefits of the Experience

The competition journey brought hurdles from battery fluctuations to technical glitches, each becoming a lesson in adaptability, a core tenet of our department. The team gained not only technical skills but also the ability to lead, communicate, and innovate under pressure. As one member reflected, ***"This wasn't just about building a car, it was about building the engineers we want to be."*** In the 2025 Chem-E Car Competition, the team embodied the department's mission to empower problem-solvers, collaborators, and global leaders, showing how support transforms classroom knowledge into lifelong expertise.

Staff

CBE Long Service Award Spotlight:
30 Years of 'Can-Do' Spirit with Dynamic Duo Lee & Yau

On June 5, 2025, the Department of Chemical and Biological Engineering proudly celebrated six colleagues with Long Service Awards for three decades of commitment: **Prof. Ping GAO, Prof. Yongli MI, Prof. Xijun HU, Miss Winnie Kit Ying LEUNG, Mr. Hoi Yao CHENG (Yao),** and **Mr. Wing Li LEUNG (Lee).**

To celebrate this milestone, we are delighted to spotlight **Lee** and **Yau**, our dynamic duo and pillars of CBE's technical excellence. On November 10, 2025, Room 4557 became more than just a meeting space; it carried a cozy ease where conversation flowed naturally, almost like sharing tea among colleagues. Against this inviting backdrop, Lee and Yau reflected on three decades of collaboration and resilience. With humor and camaraderie, their stories revealed what it truly means to grow with CBE, through fire drills, faculty friendships, and teamwork that turns colleagues into lifelong teammates. At the heart of their journey lies the enduring CBE spirit and a **"can-do"** ethos that continues to drive HKUST's forward momentum.

Journey of Growth, Teamwork, and Lasting Impressions

From the very beginning, their paths ran parallel. Lee recalls his first day with a mix of excitement and nerves, as he expresses with smiles on his face, ***"Little did I know that this day would signal the beginning of a rewarding 30 year journey."*** Yau, wide-eyed and eager, threw himself into his first experiment with the energy of a reactor on overdrive. What struck Lee most was Yau's kindness, proactivity, and organization, qualities that, he notes with admiration, ***"have stayed true for all these 30 years."*** Over time, their roles expanded and intertwined: Lee supported research across diverse fields, taught courses in air pollution and bioengineering, and stepped into leadership as safety officer, while Yau evolved from hands-on technical support to co-captain of the safety team. Together, they have kept CBE's laboratories safe and thriving, a partnership defined by collaboration and dedication.

Life and Death Situations: The Unforgettable Fire

In 2022, Lee and Yau faced a moment that tested everything they stood for. While investigating a fire incident with their insurer, "chaos erupted when a ***spontaneous fire ignited just outside the main corridor***" and within seconds "raging flames advanced, and thick smoke rapidly enveloped the area."

They sprang into action, coordinating evacuation and racing to help colleagues, even discovering that "several team members were trapped in a laboratory." Thanks to the quick response of the security officer, everyone made it out safely. Looking back, Lee reflects that the ordeal became "an unforgettable chapter in our team's story, illustrating the strength we found in adversity and highlighting the vital role of camaraderie in ***life-and-death situations.***" For both, the lesson was clear: beyond roles and responsibilities, it is the ***people and teamwork that truly matter***.

CBE Magic: Transforming Challenges into Happiness through Comradeship

Over the past 30 years, the department has grown with more staff, students, and a livelier atmosphere, as courses evolve to meet Hong Kong's needs. ***"Students now dive into research much earlier, and even our professors seem to be getting younger every year!"*** Lee smiles. Lab life has been a rollercoaster of unexpected accidents and last-minute emergencies, but to Lee and Yau, challenges became ***"valuable lessons."*** Their rhythms complement each other, with Lee the early bird and Yau the night owl, while lunch gatherings remain Lee's proud domain:

"That's where I truly shine. Who can resist a good meal and delightful company?"

In recent years, they have worked side by side on lab purchases and safety, and Lee continues to echo that it is truly a joy working with Yao, who is reliable and collaborative. Their conversations infuse a clear sense that happiness helps overcome challenges, revealing the strength of their comradeship.

Secret to 30 Years: Humors & Heart

Lee, self-crowned king of dumb jokes, keeps everyone alert and entertained, even in serious meetings, with Yau nodding that those laughs lighten the load. Their 30-year secret? Both point to **passion, patience, and people**, caring for every task, staying curious and open to learning. Their advice to newcomers:

"Take work seriously, build good relationships, enjoy the journey. There is so much to learn and grow from here."

For them, it's a path of purpose, growth, and connection, where every hurdle and shared laugh has woven CBE into an integral part of who they are.

Looking Ahead: A Legacy of Happiness and Lifelong Learning

The story of Lee and Yau's 30 years is not simply about longevity. It is about turning challenges into advancement, using humor to overcome tough times, and finding in CBE a platform and culture that nurture happiness and resilience. This is the legacy they leave behind and the path they hope future generations will carry forward. In their own words:

"Dear 2055 CBE, do not ever lose your curiosity and commitment to lifelong learning, because that spark is what drives innovation, inspires growth, and brings meaningful change to the world."

Alumni

PanopticAI's App: **World's First FDA-Cleared Contactless Pulse Monitor** from Smartphones

CBE alumnus **Dr. Kyle WONG** (PhD 2023, Bioengineering), co-founder of Hong Kong health-tech startup **PanopticAI**, has pioneered the **world's first FDA 510(k)-cleared mobile app** for contactless pulse rate measurement using iPhone/iPad cameras; with co-founders **Dr. Nick CHIN** and **Mr. Teric CHAN**, guided by **Prof. Richard SO**, their AI algorithms achieve **98% accuracy in 30 seconds** by detecting blood flow changes, turning smartphones into medical-grade monitors and establishing HKUST as the birthplace of Hong Kong's inaugural FDA-cleared Software as a Medical Device for accessible healthcare.

CBE Alumnus Wins HKSEC 2024-25 with Foodtech Startup

In a remarkable display of social innovation and entrepreneurial spirit supported by the HKSAR government, a foodtech startup founded by CBE alumnus **Matey YORDANOV** and **Francis SO**, under the guidance of **Prof. Marshal LIU**, was crowned **Champion** at the Grand Final of the **Hong Kong Social Enterprise Challenge** (HKSEC) 2024–25. Selected from more than 580 young participants across tertiary institutions, the team's achievement highlights their commitment to sustainability and reducing food waste through innovative food solutions that transform surplus produce and food manufacturing byproducts into high-value, functional products. Using advanced freeze-drying technology, their innovative smoothies preserve nutrition while extending shelf life and reducing supply-chain waste, now widely available across Hong Kong and Macau in retail shops, restaurants, cafés, and fitness centers; with support from the Hong Kong Housing Authority, the team has launched a community-focused retail concept at Domain Mall in Yau Tong, deepening local engagement and advancing their vision of a more sustainable and inclusive food ecosystem.

CBE Alumni Named **HKIE President's Protégés 2025/2026**

Three exceptional CBE alumni, **Mr. Joe CHAN Cho Hon, Mr. Cyrus LEE Sing Chun,** and **Miss Katie LI Ka Yan,** have been selected among just 13 young engineers for the prestigious **Hong Kong Institution of Engineers President's Protégé Scheme 2025/2026,** earning the rare opportunity to shadow the HKIE President and gain deep insights into leadership and the future of engineering in Hong Kong; their selection reflects not only personal excellence but also CBE's strong legacy in nurturing talent dedicated to sustainability, clean energy, and decarbonization.

A Sustainable Energy Engineering graduate, **Joe CHAN** is a Graduate Trainee at ATAL Engineering Ltd., focusing on energy optimization in buildings; **Cyrus LEE,** also in Sustainable Energy Engineering, serves as a Group Management Trainee at Towngas, advancing clean energy solutions; and **Katie LI,** with a background in Chemical and Environmental Engineering, is a Graduate Trainee at HK Electric, contributing to innovation at Lamma Power Station and supporting Hong Kong's 2050 decarbonization goals—together, they embody CBE's mission to drive impactful, real-world change through engineering.

CBE Alumna Cindy TANAKA Champions Sustainability at Deloitte

Indonesian CBE graduate Cindy Aiko Filbert TANAKA (Chemical and Environmental Engineering) is now Senior Consultant, Sustainability and Climate at Deloitte Hong Kong, her passion sparked early at HKUST under mentor Prof. Frank LAM; active in women-in-STEM initiatives, she honed analytical and leadership skills that now power her global voice, speaking at ReThink HK 2023, One Young World Summit, Green Way Macao, and HKUST AIS Seminar 2024, while advancing climate action and sustainable supply chains in a city she chose to stay and grow in.

Departmental Gatherings

The Department of Chemical and Biological Engineering's Year-End Party 2024 proved a festive triumph, drawing over 200 attendees, including faculty, staff, postgraduates, undergraduates, collaborators, and alumni, to celebrate a stellar year with holiday cheer and vibrant community spirit. Prof. Minhua SHAO, the department head, opened with warm welcoming remarks, setting the tone for an evening brimming with talent: PhD student Yuyan RUAN from Jiguang WANG's group strummed a captivating guitar solo, Zhenghua LIANG delivered a heartfelt solo song, and Research Assistant Professor Dr. Qinglan ZHAO enchanted all with her graceful Chinese Classical Dance. CBE MSc students shone through harmonious group singing, ukulele virtuoso Yikai CHEN's dual performance of instrumental and vocal flair, and Siyu CHEN's emotive solo, while students from Prof. King Lun YEUNG's group spread joy with Christmas carols, and Prof. Shao joined his research team in a unifying song, culminating in Prof. Alicia AN leading everyone in a collective anthem. Laughter echoed during an interactive computer game quizzing departmental trivia, underscoring the group's creativity and bonds.

CBE Faculty Gathering Marks **New Beginnings and Achievements**

On August 29, 2025, the Department of Chemical and Biological Engineering hosted a memorable dinner gathering in Sai Kung to warmly welcome Prof. Guohua CHEN to the faculty, celebrate the well-deserved promotions of Prof. King Lun YEUNG and Prof. Yoonseob KIM, and reflect on the successful close of the 2024/2025 academic year. The event united the full spectrum of CBE faculty—tenured, emeritus, jointly appointed, adjunct, visiting, and teaching professors—in a collegial and festive atmosphere that strengthened bonds and honored shared milestones.

Class of 2025

Graduation Photo

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THE HONG KONG UNIVERSITY OF SCIENCE AND TECHNOLOGY

Department of Chemical and Biological Engineering
Master Class 2025

香 港 科 技 大 學
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Department of Chemical and Biological Engineering
Undergraduate Class 2025

DEPARTMENT OF
CHEMICAL AND BIOLOGICAL ENGINEERING
化學及生物工程學系

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