CityU
香港城市大學
City University of Hong Kong

# CityUHK Engineering Newsletter

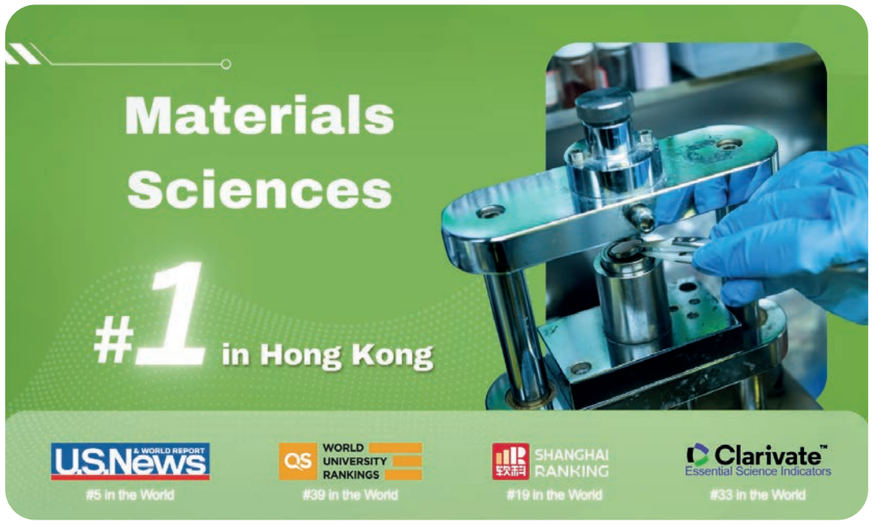
April 2026

## CityUHK College of Engineering excels in QS World University Rankings by Subject 2026

Three engineering-related subjects top 100 in THE World University Rankings by Subject 2026

CityUHK leads Hong Kong in US patents for 10th consecutive year, remains among Asia's top 10

# CityUHK College of Engineering excels in QS World University Rankings by Subject 2026




## Dean's Message

I am delighted to share that the College of Engineering at City University of Hong Kong has once again delivered an outstanding performance in the Quacquarelli Symonds (QS) World University Rankings by Subject 2026.

This year, Materials Science has achieved a remarkable milestone, rising 13 places to 39th globally and securing the Number 1 position in Hong Kong for the 1st time across major ranking systems: QS, ShanghaiRanking's Global Ranking of Academic Subjects, U.S. News & World Report, and Clarivate's Essential Science Indicators.

We are also pleased to see strong performance across other engineering-related fields. According to QS, our subject areas have shown excellent citation performance, including:

**Broad Subject Area**
- Engineering and Technology, 11th globally

**Subjects**
- Mechanical, Aeronautical and Manufacturing Engineering, 2nd globally
- Architecture and Built Environment, 11th globally
- Electrical and Electronic Engineering, 13th globally

These results demonstrate the breadth and depth of our academic excellence and our continued progress on the global stage.

Our success in Materials Science is especially meaningful because it also aligns with broader recognition of CityUHK's research strength, including the presence of 120 College's faculty members among "World's Top 2% Scientists 2025" by Stanford University, and 19 scholars from the College recognised as "Highly Cited Researchers 2025" by Clarivate.

I would like to express my sincere gratitude to all faculty members, researchers, staff, students, and partners whose commitment and perseverance have made these achievements possible. Let us continue to build on this momentum and pursue excellence with confidence and purpose.

**Professor LU Jian**
Dean, College of Engineering
City University of Hong Kong





# CityUHK named "Most International University in the World" for 3rd consecutive year; attracting global talent to "Study in Hong Kong"

City University of Hong Kong (CityUHK) has been ranked the "Most International University in the World" by Times Higher Education (THE) for 2026, marking the 3rd consecutive year it has achieved the top spot. This accolade highlights the University's excellence in fostering an internationalised teaching and research environment. It also underscores CityUHK's active commitment to supporting the Hong Kong Special Administrative Region of the People's Republic of China "Study in Hong Kong" initiative, further demonstrating Hong Kong's appeal and influence as a global hub for higher education.

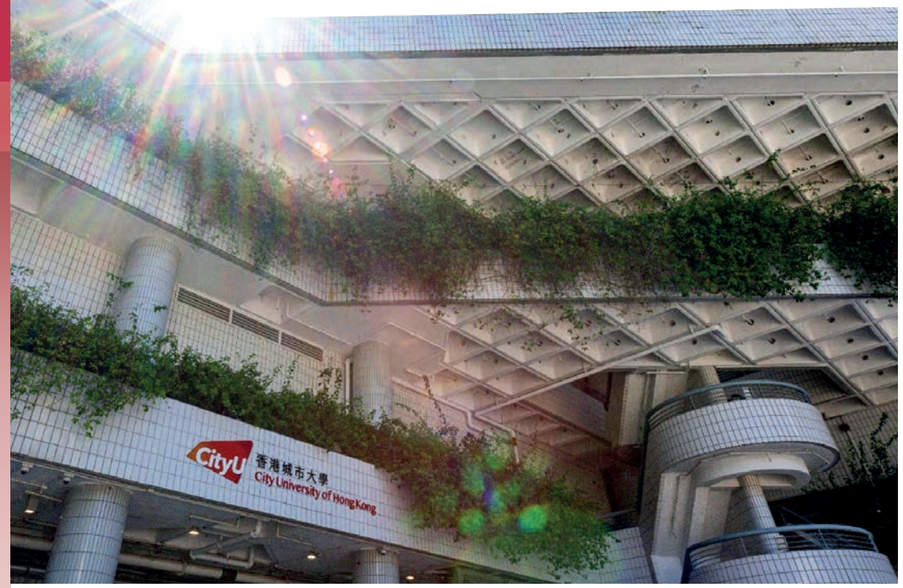
THE evaluated 2,191 universities based on the World University Rankings 2026 data, with 217 institutions from 42 countries and regions meeting the criteria. CityUHK once again topped the list by excelling across multiple metrics, including the "proportion of international students", "proportion of international staff", "international co-authorship", and "international reputation".

As a pioneer in advancing the internationalisation of higher education, CityUHK is actively supporting Hong Kong's development into an international hub for higher education by promoting the "Study in Hong Kong" brand. Through an international collaborative network comprising over 400 institutions globally, CityUHK students enjoy extensive opportunities for overseas exchange. CityUHK also boasts a diverse student body and academic community, with students from approximately 100 countries and faculty hailing from over 40 nations and regions.

The University offers joint bachelor's degree programmes in partnership with Columbia University, the US and Université Paris-Saclay, CentraleSupélec, France. Furthermore, CityUHK has signed agreements with several colleges at the University of Cambridge and, in the 2025/26 academic year, became the first international partner institution for the "Future Global Leaders Programme" at Lucy Cavendish College, Cambridge. In recent years, the University has expanded its reach to include "Belt and Road" countries such as Kazakhstan, Türkiye, Kuwait, and Azerbaijan, further enriching the depth and diversity of the "Study in Hong Kong" brand.

*Content adapted from CityUHK NewsCentre*

# Three engineering-related subjects top 100 in THE World University Rankings by Subject 2026



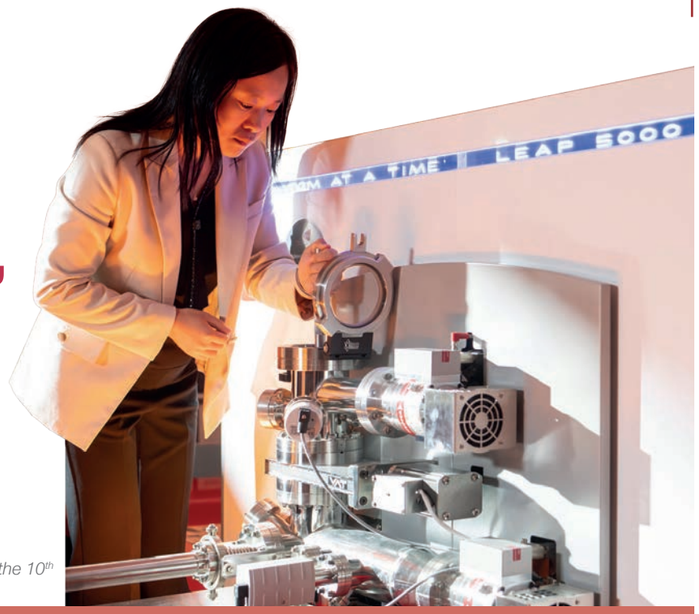

City University of Hong Kong (CityUHK) excelled in the latest Times Higher Education (THE) World University Rankings by Subject 2026, with seven subjects ranked among the world's top 100 and two ranked among the world's top 50 and Asia's top 10. Notably, Engineering, Computer Science, and Physical Sciences, three key engineering-related disciplines, all secured top 100 position worldwide. These remarkable rankings underscore the College's research excellence, academic impact, and growing global leadership in cutting-edge technological innovation.

The THE World University Rankings by Subject 2026 methodology is designed to evaluate universities using a refined version of the overall World University Rankings 2026 methodology. It assesses performance across 11 major subject areas using 18 indicators grouped into five core pillars: teaching, research environment, research quality, international outlook, and industry. Together, these indicators provide a comprehensive view of academic and research excellence worldwide.

*Content adapted from CityUHK NewsCentre*



# CityUHK leads Hong Kong in US patents for 10th consecutive year, remains among Asia's top 10



*CityUHK leads Hong Kong in US patents for the 10th consecutive year.*

City University of Hong Kong (CityUHK) has once again secured its position in the prestigious global Top 100 Worldwide Universities for most US patents granted, leading Hong Kong for the 10th consecutive year. The University is also the only local institution on the list. This outstanding performance reaffirms CityUHK's role as a core driver of innovation and scientific research in Hong Kong, highlighting the University's impact on societal advancement and economic development through research breakthroughs and patent commercialisation.

Since 2013, the National Academy of Inventors (NAI) has annually released the Top 100 Worldwide Universities list to recognise universities for their achievements in research innovation and its commercial applications. With 88 US Utility Patents granted in 2025, CityUHK ranked 35th globally and 8th in Asia. The results demonstrate the University's strong research capabilities and reflect international recognition of its long-term commitment to knowledge transfer, industry collaboration and innovation deployment.

As of 29 January 2026, CityUHK had filed 1,824 patent applications worldwide, securing 844 patents covering a wide range of fields, including information and communications technology, artificial intelligence and data science, materials science and physics, bio-engineering and life sciences, and green technologies. Currently, nearly 100 patents have attracted investment from HK Tech 300 Angel Fund start-up teams through licensing agreements, creating an effective pathway from research to market and promoting broader societal applications of CityUHK's innovations.

CityUHK places inspiration, interaction and innovation at the core of its educational and research mission. Through forward-looking initiatives such as HK Tech 300, the CityUHK Academy of Innovation, and the Institute of Digital Medicine, the University systematically nurtures innovation talent and accelerates technology translation to address critical challenges faced by both local and global communities.

The University's academic influence continues to rise. In the list of Highly Cited Researchers 2025 by Clarivate, 32 CityUHK scholars were named, ranking the University 9th in Asia and 2nd in Hong Kong. In terms of faculty size, CityUHK led Hong Kong in the proportion of the world's most Highly Cited Researchers for the 10th consecutive year, underscoring the long-standing international impact and exceptional performance of its research community.

The NAI collaborates with more than 260 US and international universities, government agencies and non-profit research institutes. It is dedicated to recognising inventors with US patents, enhancing the visibility of academic technology and innovation, promoting intellectual property disclosure and education, and enhancing public understanding of how the inventions benefit society.

*Content adapted from CityUHK NewsCentre*

# CENG secures two RGC Research Impact Fund projects

*Professor Li Hanxiong (Left) and Professor Huang Gongsheng*

Four research projects led by City University of Hong Kong (CityUHK) have been awarded HKD22.6M from the Research Grants Council (RGC) under the Research Impact Fund (RIF) 2025/26, ranking the University first among the eight UGC-funded universities in both the number of projects and funding. Notably, the College of Engineering (CENG) led two of these projects, underscoring our excellence in sustainable innovation and advanced manufacturing, and inspiring pride in our collective achievements.

| Project leader(s) | Project name | Brief |
|---|---|---|
| **Professor Li Hanxiong**, Department of Systems Engineering and the late **Professor Hu Jinlian** | Integrative Study on Needleless (Wire) Electrospinning for Massive Production (HKD4.53M) | Utilising AI and digital twin technologies, this project investigates the mechanisms of needleless electrospinning. The goal of the project is to enable intelligent material design and large-scale nanofiber production, ultimately boosting research and development efficiency and scalable manufacturing. |
| **Professor Huang Gongsheng**, Department of Architecture and Civil Engineering | Development of Decoupled Radiant Cooling Technique for Advancing Building Energy Efficiency under Hot and Humid Climates (HKD4.48M) | This project addresses the challenge of condensation in radiant cooling systems by developing decoupled technology. It aims to significantly enhance building energy efficiency in hot, humid climates while reducing carbon emissions and improving occupants' well-being. |

The success of these projects demonstrates CENG's ability to bridge the gap between laboratory research and industrial application. By securing this significant funding, the College continues to strengthen its role as a regional leader in engineering, providing innovative solutions to some of the most pressing technical challenges today.

*Content adapted from CityUHK NewsCentre*



# Congratulations to CENG's research teams on winning awards at 51st Geneva International Exhibition of Inventions


At the 51st International Exhibition of Inventions of Geneva, research teams from the College of Engineering (CENG) secured four awards. This success highlights CENG's continued excellence in engineering research and innovation, and demonstrates the College's growing impact in addressing real-world challenges through cutting-edge technological solutions.

| Project | Inventor(s) from CENG |
|---|---|
| Gold Medal with Jury Congratulations | |
| UniquePOKE series: The multifunctional biochip for therapeutic cell engineering | Department of Materials Science and Engineering & Department of Chemistry<br>Professor Zhang Wenjun<br>Department of Materials Science and Engineering<br>Dr Yang Yang |
| Gold Medal | |
| A multi-scale vascular network bioprinting strategy for tissue regeneration and bioengineered organs | Department of Mechanical Engineering<br>Professor Lu Jian and Dr Wang Wanying |
| Silver Medal | |
| Intelligent wireless power network for autonomous underwater vehicles | Department of Electrical Engineering<br>Professor CQ Jiang, Dr Ben Zhang, Mr Wang Yibo, Mr Yang Fengshuo, Dr Guo Weisheng and Dr Wang Xiaosheng |
| Bronze Medal | |
| Enamel regenerating toothpaste | Department of Materials Science and Engineering & Department of Mechanical Engineering<br>Professor Li Yangyang, Professor Lu Jian, Dr Tang Xinxue, Mr Lawrence Chan Long, Mr Li Dedi, Dr Li Hongkun, Mr Yue Hong and Dr Shen Junda |

*Content adapted from CityUHK NewsCentre*

# CENG wins six awards at 5th Asia Exhibition of Innovations & Inventions Hong Kong

*CityUHK wins 17 awards at the 5th Asia Exhibition of Innovations & Inventions Hong Kong.*

The College of Engineering (CENG)'s faculty members secured three Gold Medals and three Silver Medals at the 5th Asia Exhibition of Innovations & Inventions Hong Kong.

| Project | Inventor(s) from CENG |
|---|---|
| Gold Medal | |
| Self-Powered Magnesium-Nitrate Cell for Simultaneous Nitrogen/Phosphorus Removal and Recovery from Wastewater | Department of Materials Science and Engineering<br>Professor Johnny Ho, Dr Chen Dong, Dr Quan Quan and Miss Yin Di |
| CityAir+ UltraPurification: UVC Optical Cavity-based Enhancer, Self-Cleaning Photocatalysis, and Silver-Ion Antimicrobial Filtration for Synergistic Air Purification | Department of Materials Science and Engineering<br>Professor Juan Antonio Zapien, Miss Kwong Yee Man, Dr May Thawda Phoo and Dr Md Rashedul Huqe |
| Towards a Smarter, Connected World: Automatic, Intelligent and Reliable Submarine Optical Cable Path and System Design | Department of Electrical Engineering<br>Professor Moshe Zukerman, Professor Yanni Sun, Mr Fahan Chen, Dr Wang Xinyu, Dr Wang Tianjiao and Dr Chao Guo |
| Silver Medal | |
| A Bio-Photoelectrochemical Tandem Reactor for Simultaneous Wastewater Treatment and Hydrogen Production | School of Energy and Environment & Department of Materials Science and Engineering<br>Professor Sam Hsu |
| Photovoltaic-Powered Perovskite-Based Photoelectrochemical Devices for the Co-Production of Renewable Fuels and High-Value Chemicals from $CO_2$ Emission | School of Energy and Environment & Department of Materials Science and Engineering<br>Professor Sam Hsu |
| Photocatalytic ABS Nanocomposite for Self-Cleaning, Bactericidal, and Air Purification | Ability R&D Energy Research Centre, School of Energy and Environment & Department of Mechanical Engineering<br>Professor Michael Leung |

*Content adapted from CityUHK NewsCentre*

# Dr Calvin Keung honoured with 2025/26 Teaching Excellence Award

*Dr Keung (right) aims to nurture construction talents in the digital era.*

City University of Hong Kong (CityUHK) announced the 2025/26 Teaching Excellence Award (TEA) recipients. Among the awardees, **Dr Calvin Keung** from the Department of Architecture and Civil Engineering, stands out for his innovative work in architecture and civil engineering.

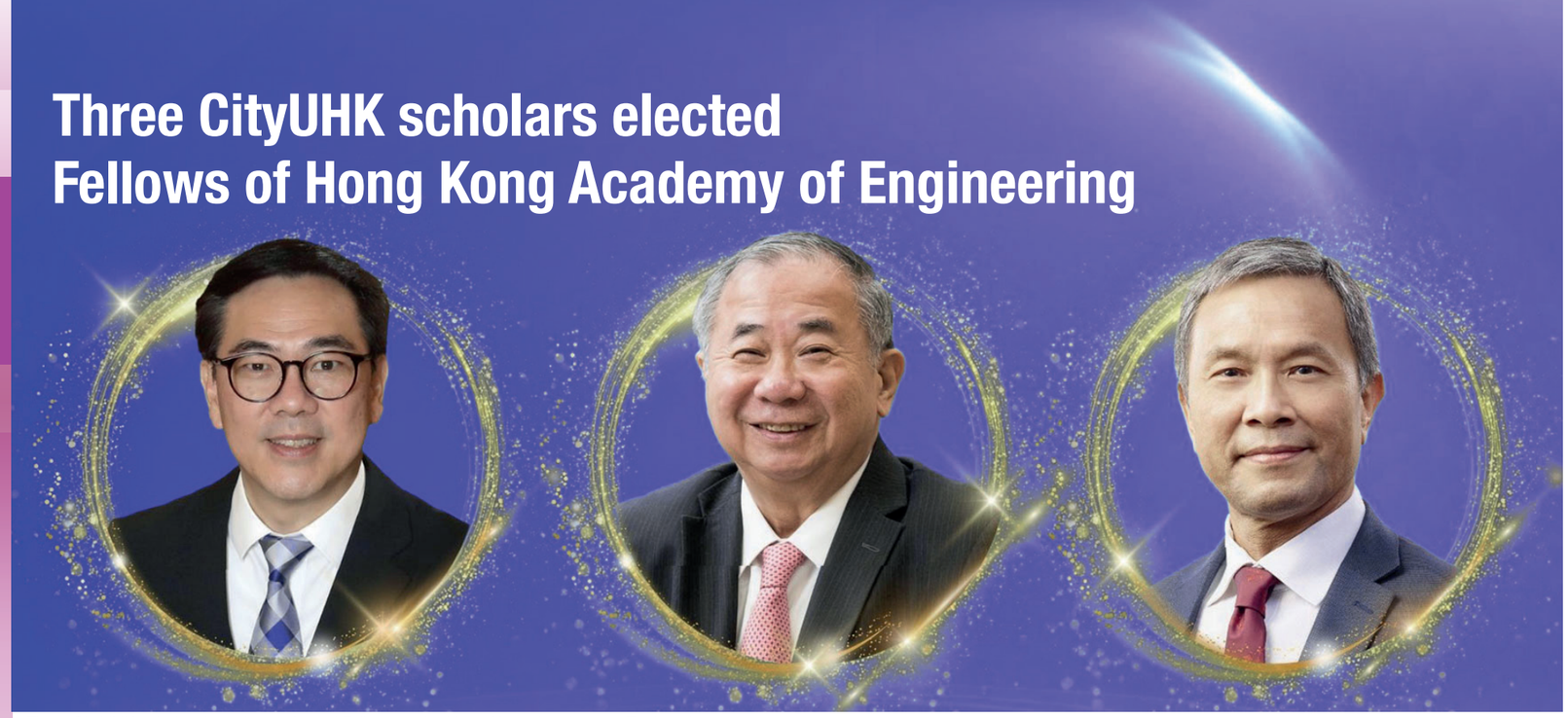
In addition to his role as a Teaching Fellow at CityUHK, Dr Keung is a Registered Professional Surveyor and a certified Building Information Modelling (BIM) Manager of the Construction Industry Council. He has leveraged his industry expertise to develop a tech-driven BIM curriculum framework for the University, addressing the rising demand for surveyors equipped with BIM expertise. Furthermore, he has designed and introduced undergraduate courses focused on BIM, nurturing future construction talents in the digital era.

Dr Keung effectively deploys emerging technology, widely incorporating AI and digital learning into daily classroom activities. He also promotes interdisciplinary collaboration practices, notably by coordinating BIM implementation in the "Integrated Building Project Development" course. He also leads the establishment of the Built-Informatics and Smart City Cluster, which features a cloud-based BIM server, extended reality applications, an interactive smart table, and a generative AI-powered ChatBIM system, creating a dynamic and engaging learning environment for students.

Since implementing this teaching model in 2020, the team has successfully established a collaborative entrepreneurial learning ecosystem. Some students have not only received seed funding from HK Tech 300, CityUHK's flagship innovation and entrepreneurship programme, but have also excelled in external start-up competitions.

*Content adapted from CityUHK NewsCentre*

# Three CityUHK scholars elected Fellows of Hong Kong Academy of Engineering



*Three CityUHK scholars have been elected Fellows of the Hong Kong Academy of Engineering.*

**Professor Freddy Boey**, President and University Distinguished Professor of City University of Hong Kong (CityUHK), **Professor Michael Tse**, Associate Vice-President (Innovation), and **Professor Richard Yuen**, Chair Professor of the Department of Architecture and Civil Engineering, have been elected Fellows of the Hong Kong Academy of Engineering (HKAE) for 2025 in recognition of their outstanding contributions to the field of engineering.

Since assuming the role of CityUHK President in May 2023, **President Freddy Boey** has been dedicated to leading the University towards internationalisation, through the strategic development framework "Innovating into the Future". Under his leadership, CityUHK has been named the "Most International University in the World" by Times Higher Education for three consecutive years in 2024, 2025 and 2026.


*(From left) Dr Alex Chan, HKAE President and President Boey*

President Boey holds numerous original patents and has outstanding achievements in medical applications of high-performance biomaterials.

His research has had a profound global impact, earning him numerous international accolades, including the President's Science and Technology Award, Singapore's highest Scientific Award, in 2013, and the prestigious Imperial College London Faculty of Medicine Fellow award, in recognition of his outstanding contributions to biomedicine. In 2014, he received Singapore's President's Technology Award for successfully developing nanostructure technology for drug delivery systems. In 2016, he was awarded the Singapore National Day Public Administration Gold Medal.

Additionally, President Boey has been conferred the title of Senior Research Associate of Peterhouse, University of Cambridge, and has received Honorary Doctorates from Loughborough University in the United Kingdom and Tianjin University in Chinese Mainland. He has also been conferred Honorary Professorships from the University of Indonesia, Nanjing Postal and Telecom University, and Nanjing Technological University.

The HKAE commended President Boey for pioneering biomaterials and nanotechnology in medicine, including biodegradable stents and surgical retractors, which have been successfully commercialised.

**Professor Michael Tse** joined CityUHK in 2021 and currently serves as Associate Vice-President (Innovation), Director of the CityUHK Academy of Innovation, and Chair Professor in the Department of Electrical Engineering. Professor Tse's research areas include power electronics, smart grids, nonlinear circuits and systems, and complex network applications. He has been awarded or appointed as an Honorary Professor and Fellow by several universities, including the University of Calgary, Melbourne University and Royal Melbourne Institute of Technology University. In 2022, he was awarded the IEEE CASS Charles A. Desoer Technical Achievement Award, becoming the first academic in Hong Kong to receive this award.


*(From left) Dr Chan and Professor Tse*

The HKAE praised Professor Tse for his pioneering contributions to power electronics, including ultra-fast transient voltage regulation, sliding-mode control for converters, robust EV charging and wireless power transfer.

**Professor Richard Yuen** joined CityUHK in 1988. He is a Registered Professional Engineer and a Fellow of the Hong Kong Institution of Engineers. He currently serves as a Member of Committee on Self-financing Post-secondary Education by Education Bureau, the Government of the Hong Kong Special Administrative Region of the People's Republic of China, and the Deputy Chairman of the Hong Kong Council for Accreditation of Academic and Vocational Qualifications. His research expertise includes fire safety and engineering, pyrolysis and combustion, applications of computational fluid dynamics, flame-retardant materials, neural network modelling applications in fire engineering, building energy conservation, Heating, Ventilation & Air Conditioning systems. He was awarded the CityUHK President's Award in 2016.

The HKAE commended Professor Yuen for pioneering CFD and machine learning models in fire engineering, advancing fire safety, flame retardant materials and human evacuation, which have had profound impacts on engineering practices.


*(From left) Dr Chan and Professor Yuen*

Established in 1994, the HKAE aims to promote collaboration and innovation to advance engineering development in Hong Kong. It comprises a distinguished group of Fellows from various engineering disciplines, recognised as leaders in their profession, with remarkable achievements in engineering sciences and applications.

*Content adapted from CityUHK NewsCentre*


*CityUHK will establish two world-class research centres under the Hong Kong SAR Government's third InnoHK research cluster "SEAM@InnoHK".*

# CityUHK to establish two world-class research centres under HKSAR Government's third InnoHK research cluster "SEAM@InnoHK"

City University of Hong Kong (CityUHK) is actively supporting the Hong Kong Special Administrative Region of the People's Republic of China Government's third InnoHK research cluster, "SEAM@InnoHK", which focuses on four major research areas, namely sustainable development, energy, advanced manufacturing and materials. CityUHK proudly announced that two proposals it submitted jointly with leading international universities to establish research centres have been selected, highlighting CityUHK's global leadership in sustainable development, advanced manufacturing and materials science.

*From left: Professor Jen and Professor Lu*

Sustainable Materials & Advanced Renewable Technologies Centre (SMART)

Co-led by **Professor Alex Jen**, Lee Shau Kee Chair Professor of Materials Science at CityUHK, and Professor Harm-Anton Klok, of the École Polytechnique Fédérale de Lausanne, Switzerland, the SMART Centre will develop and build AI/ML-enabled materials design platforms and self-driving laboratories to develop breakthrough new materials and renewable energy solutions. This includes the technologies for printable solar cells, rechargeable batteries, green hydrogen energy, and sustainable packaging materials made from food waste and plastic waste.

Centre for Advanced and Smart Manufacturing (CASM)

Led jointly by **Professor Lu Jian**, Dean of the College of Engineering at CityUHK, and Professor Colm Durkan from the University of Cambridge, the United Kingdom, the Centre focuses on intelligent, precise, and sustainable next-generation manufacturing technologies.

Cambridge researchers will establish satellite operations in Hong Kong, while CASM scientists gain access to Cambridge's world-leading facilities. The Centre will deliver six tightly integrated researches, including a platform for quantum-level precision in predicting material performance; zero-energy cooling technology, cognitive manufacturing systems to optimise production processes; and next-generation materials to enable future mobility – together to drive synergistic effects across industries.

Leveraging the entrepreneurship training, resources, and global industry network of CityUHK's HK Tech 300, the centres will be dedicated to translating research achievements into real-world applications, while contributing to carbon reduction, sustainability, and new industrialisation in Hong Kong and beyond.

**Professor Michael Yang**, Senior Vice-President (Innovation and Enterprise) of CityUHK, said, "The selection of our proposals demonstrates CityUHK's leadership in global research collaboration. Through CASM and SMART, we aim to advance next-generation smart manufacturing and sustainable energy materials, injecting fresh momentum into Hong Kong's innovation and technology development. CityUHK has been recognised as the Most International University in the world for three consecutive years (2024, 2025 and 2026), and we will continue to leverage this strength to foster impactful research partnerships with top global institutions. Together, we will translate innovation into real-world benefits for society and contribute to Hong Kong's development as a world-class innovation and technology hub."

"The two InnoHK centres were established through close research partnerships between CityUHK and our overseas partner universities, as well as strong interdisciplinary collaboration," said **Professor Anderson Shum**, Vice-President (Research) of CityUHK. "With the support of InnoHK, CityUHK teams are well positioned to make an impact that extends beyond academia, particularly in the critical fields of advanced manufacturing, sustainable development, energy and materials."

InnoHK is a major innovation and technology initiative of the Hong Kong SAR Government, designed to attract leading international research institutions to collaborate with local universities, establish research centres/laboratories in Hong Kong, and translate scientific outcomes into impactful, real-world applications. Following the successful establishment of the first two platforms, namely Health@InnoHK, focusing on healthcare technology, and AIR@InnoHK, focusing on artificial intelligence and robotics technologies, the launch of SEAM@InnoHK marks a new milestone in Hong Kong's innovation and technology development. CityUHK has established three world-class research centres under the first two InnoHK research clusters. The newly established CASM and SMART will complement these existing centres, further enriching CityUHK's strengths in innovation and technology, accelerating research translation, driving local industrial upgrading, and nurturing research talent. Together, they aim to make a lasting global impact and help position Hong Kong as a premier international hub for scientific collaboration.

*Content adapted from CityUHK NewsCentre*

# CLP Power and CityUHK sign MoU to advance metal 3D printing applications in power industry

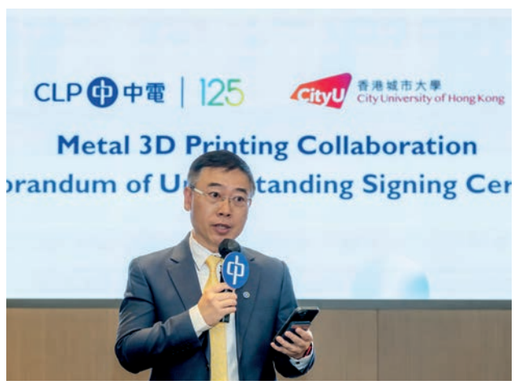
CLP Power Hong Kong Limited (CLP Power) and the Hong Kong Branch of National Precious Metals Material Engineering Research Center (NPMM) at City University of Hong Kong (CityUHK) signed a Memorandum of Understanding (MoU) to promote the application of metal 3D printing technology in power generation equipment components. By combining CLP Power's expertise in power engineering with CityUHK's strengths in precious metal materials research, the collaboration aims to enhance the durability and usability of the components while fostering innovation in advanced technologies.


*The MoU is signed by Mr Ng Ki-on, CLP Power Director of Generation Engineering (front row, left), and Professor Lu Jian, Dean of the College of Engineering and Director of the NPMM of CityUHK (front row, right), and witnessed by Mr Lau (back row, left) and Professor Shum (back row, right).*

To ensure the safe and reliable operation of power generation units, CLP Power engineering teams conduct regular maintenance, including renewal of components as needed. In some cases, where original equipment manufacturer parts are not readily available, CLP Power has used 3D printing technology to produce the required components. This provides flexible support for maintenance and enhances operational efficiency and cost effectiveness.

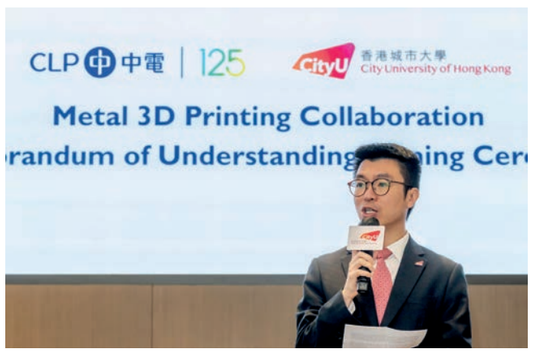
Under the MoU framework, CLP Power and CityUHK will strengthen technical exchanges to identify suitable applications of metal 3D printing technology in power stations. The collaboration will assess the feasibility of adopting new metal materials and advanced printing technologies to enhance the performance, durability and reliability of metal printed components, with a view to extending lifespans, optimising maintenance strategies, and strengthening the reliability and resilience of power generation system.

**Mr Kevin Lau**, CLP Power Senior Director of Generation said, "CLP Power is pleased to collaborate with CityUHK, combining our expertise in power engineering with their advanced research in precious metal materials to drive the application of metal 3D printing in the power industry. This partnership aims to develop innovative and efficient maintenance solutions for power generation, enhancing the flexibility of spare parts supply and improving component performance, which will further strengthen the stability and reliability of our power generation system. CLP Power continues to adopt innovative technologies to optimise power station operations and asset management. We are confident that this collaboration with CityUHK will further enhance our operational efficiency and reinforce our commitment to providing world class power services to Hong Kong."




*Mr Lau*

**Professor Anderson Shum**, Vice-President (Research) of CityUHK, said, "CityUHK is dedicated to research that has a real-world impact, and this partnership marks a significant milestone in our long-standing relationship with CLP Power. Our goal is to apply metal design and printing technologies to ensure that components of power generation equipment operate with greater stability, longer lifespans and significantly greater efficiency. I am confident that this collaboration will strengthen Hong Kong's position as a hub for engineering excellence and sustainable development."




*Professor Shum*

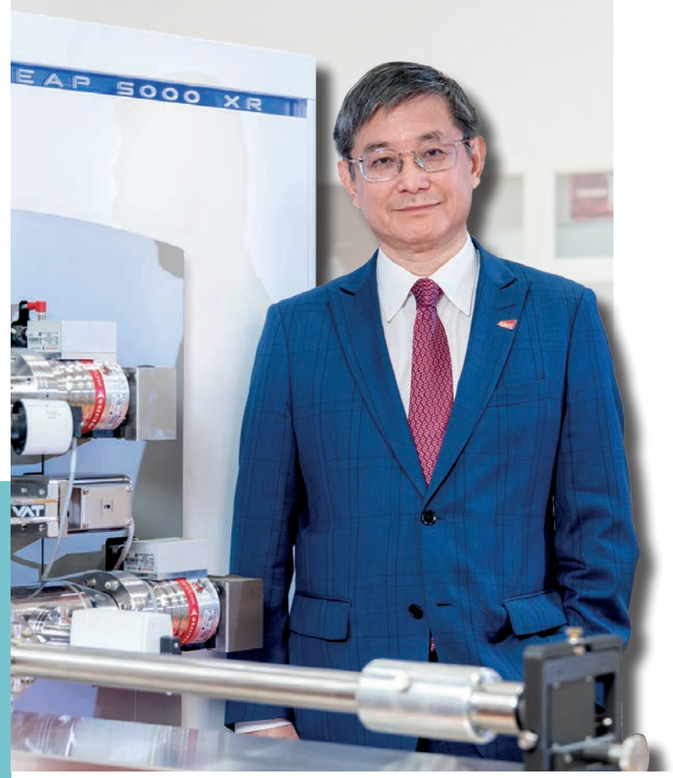
*This photo shows components of power generation equipment produced using metal 3D printing technology.*

*Mr Lau (left) visits laboratories at CityUHK, accompanied by Professor Lu (middle), to gain an overview of advancements in innovative technologies.*

*Source: CityUHK NewsCentre*

# CityUHK research team develops 3D-printed biomimetic “mechanoelectrical” smart materials inspired by sea urchin spines published in Nature

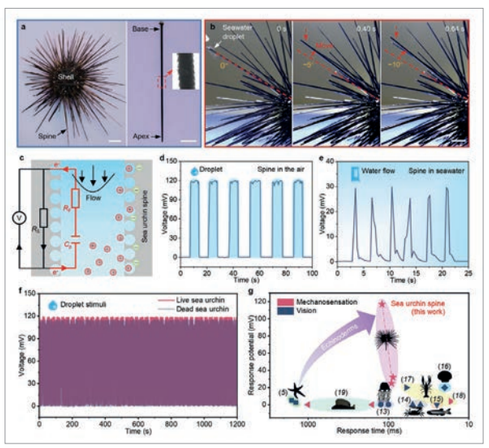
A research team led by **Professor Lu Jian**, Dean of the College of Engineering and Chair Professor in the Department of Mechanical Engineering at City University of Hong Kong (CityUHK), has discovered for the first time that the naturally occurring porous ceramic structure within sea urchin spines possesses an unexpected capability for mechanoelectrical perception. The study, titled “Echinoderm stereom gradient structures enable mechanoelectrical perception”, was recently published in the prestigious international journal *Nature*.



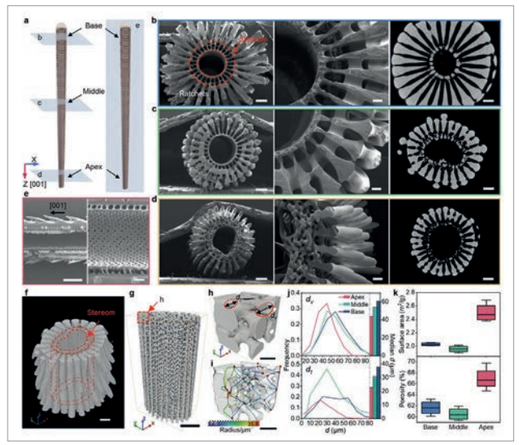

*Professor Lu*

The team revealed that when water droplets or flowing water passes over the spine’s surface, its gradient cellular structure instantaneously generates measurable voltage signals. The response speed is remarkably efficient — more than a thousand times faster than echinoderm visual perception.

Inspired by this natural architecture, the team combined biomimetic structural design with advanced 3D printing technology to replicate and enhance this capability, opening new avenues for next-generation smart sensing and underwater monitoring materials.




*In situ observation of mechanoelectrical perception in the living sea urchin spine*




*Analysis of the gradient stereom porous structure in sea urchin spine*

Through in situ observations of the long-spined sea urchin (Diadema setosum), the researchers found that when a seawater droplet falls onto the spine’s apex, the spine rotates rapidly within approximately one second, demonstrating a highly sensitive tactile response. Subsequent voltage measurements revealed that droplet stimulation induces a transient potential of approximately 100 mV, while flowing water triggers stable electrical signals. The entire response occurs within tens of milliseconds. Notably, even in the absence of any viable cellular tissue, the spines still produce the same voltage response, confirming that this perception capability stems from the intrinsic physical mechanism of the material and its microstructure rather than from neural or biological tissues.

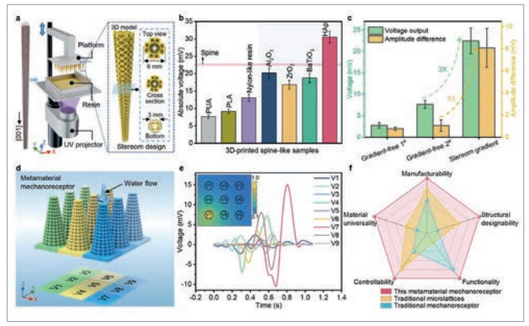
Scanning electron microscopy and micro-computed tomography analyses revealed that the spine consists of a bicontinuous porous skeleton, known as stereom, which exhibits a pronounced gradient in pore size along the spine axis. Compared with the base, the apex region features smaller pore diameters, higher porosity and greater specific surface area, enhancing solid–liquid interfacial charge separation when fluid flows through. As water moves through these microchannels, an electric double layer forms at the interface, generating a streaming potential that is converted into measurable voltage signals, effectively enabling the spine to function as a natural microscale sensor.

To verify the generality of this structure-induced phenomenon, the team fabricated biomimetic gradient porous polymer and ceramic samples using vat photopolymerisation 3D printing. Experimental results showed that compared to gradient-free structures, the biomimetic gradient designs exhibited a threefold increase in voltage output and an eightfold increase in signal amplitude. These findings show that mechanoelectrical perception is governed primarily by topological structure rather than material composition. The researchers then constructed a biomimetic metamaterial mechanoreceptor comprising multiple gradient units. This device is capable of real-time detection of underwater flow direction and intensity with time-resolved self-monitoring, without the need for external sensors or power supplies.

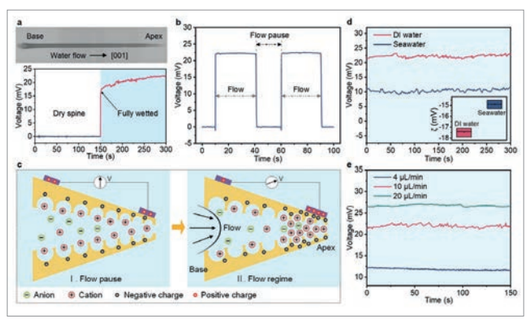
“Through biomimetic structural design and 3D printing, we have successfully translated nature’s wisdom into smart materials,” said **Professor Lu Jian**. “Our goal in fabricating biomimetic functional materials is to extend this structure–function integration concept found in nature into engineered systems, paving the way for a new generation of self-sensing intelligent materials.”

This study challenges the conventional view that natural porous structures serve primarily mechanical functions, revealing their latent sensing capabilities and providing new insights into structure–function integrated material design. With continued advances in 3D printing technologies, these biomimetic gradient porous structures hold strong potential for applications in marine environmental monitoring, intelligent underwater exploration, water resource management, energy storage, biomedical devices and aerospace engineering, forming a foundational platform for next-generation of integrated structural/functional materials.

This study is a collaborative effort between CityUHK, The Hong Kong Polytechnic University, and Huazhong University of Science and Technology.




*Generality, practicality and applicability of mechanoelectrical perception enabled by gradient cellular structures*




*Mechanism of mechanoelectrical perception within the sea urchin spine*

*Content adapted from CityUHK NewsCentre*

# CityUHK's STEM Career Fair 2026 achieves resounding success

Jointly organised by the College of Computing, College of Engineering, College of Science, and School of Energy and Environment, the STEM Career Fair 2026 was successfully concluded at the City University of Hong Kong (CityUHK) on 28 January. As the first career event of 2026 and CityUHK's sole STEM-focused fair, it served over 4,000 students across 13 departments and 27 disciplines from these organising colleges and schools.

The event drew 72 leading companies and two prominent professional associations—The Hong Kong Institution of Engineers (HKIE) and Hong Kong Institute of Human Resource Management (HKIHRM). Participating organisations included Deloitte, KPMG, PwC, Siemens Limited, CLP Group, CATL, IBM China/Hong Kong Limited, Hong Kong Science and Technology Parks, and Gammon Construction Limited. Recruiters commended the students' enthusiasm, the diverse talent pool spanning multiple disciplines, the convenient venue, and substantial attendance, describing it as an optimal platform for talent acquisition, brand promotion, and direct student interaction.

A major highlight was the Super Connect Networking Lunch, which gathered approximately 150 distinguished guests, including the presidents of HKIE and HKIHRM, senior executives from multinational corporations (MNC), technical directors, HR directors, college leadership, and department heads. Participants praised it as an exceptional venue for supporting faculty members in establishing closer networks with industry, identifying project opportunities, and enhancing student employment and internship prospects.


*Super Connect Networking Lunch gathers 150 distinguished guests, including HKIE and HKIHRM presidents, MNC executives, and senior management of the organising Colleges.*


*Over 4,000 students flock to CityUHK's STEM Career Fair 2026, to connect with top employers and explore career opportunities.*

Career Coaching, Winning CV Workshop, and Styling and Image Workshop attracted more than 240 students, significantly surpassing planned capacities. The first-ever One-Day Mentorship Programme paired 17 industry mentors from 11 sectors with around 70 students in small groups of five per mentor, facilitating in-depth discussions on career development that received acclaim from both mentors and students. Individual coaching sessions were led by professional coaches, including human resources leaders from multinational firms and specialists in the Greater Bay Area.


*Students actively participate in the Winning CV Workshop, gaining practical tips and expert guidance on crafting compelling CVs.*

*One-Day Mentorship Programme pairs 17 mentors from 11 sectors with 70 students for acclaimed career discussions.*

The fair continues to enjoy strong employer support, with many organisations regarding it as essential for their recruitment efforts. This triumph underscores CityUHK's commitment in cultivating top STEM talent, supported by valued industry partners.

Glance at the event highlights video:
https://www.youtube.com/watch?v=oydSx6DZMI4

# CENG engages global partners at APAIE 2026

*Professor Lu (4th from left) joins the "Study in Hong Kong" reception to welcome partners.*

The 2026 Asia-Pacific Association for International Education (APAIE) Conference & Exhibition, hosted by The Chinese University of Hong Kong and co-hosted by CityUHK and six other universities funded by the University Grants Committee, was held from 23 to 27 February at the Hong Kong Convention and Exhibition Centre. At the opening ceremony, **Professor Lee Chun-sing**, Provost and Deputy President of CityUHK, was among the officiating guests to kick off the event. Under the theme "Asia-Pacific Partnerships for the Global Good", the College of Engineering (CENG) delegation forged valuable connections with overseas partners. **Professor Lu Jian**, Dean of CENG, joined the "Study in Hong Kong" reception to welcome global collaborators.

**Professor Shek Chan Hung**, Associate Dean (Undergraduate Education) of CENG, delivered a standout presentation in the session "Bridging Cultures through Dual Degrees: French-Hong Kong Academic Partnerships", chaired by Mr Eric Chevreuil, Deputy Consul for Culture, Education and Science, Consulate General of France in Hong Kong and Macao. Joining speakers from HKBU and HKUST, Professor Shek showcased CENG's Joint Bachelor's Degree Programs, student mobility schemes, scholarships, and compelling case studies that enhance graduate employability and intercultural competence, earning enthusiastic audience acclaim. These engagements advanced discussions on international education, student exchange, and research collaboration opportunities across the Asia-Pacific and beyond.

*Content adapted from CityUHK NewsCentre*


*Professor Shek (right) speaks at APAIE 2026's Bridging Cultures through Dual Degrees: French-Hong Kong Academic Partnerships session.*


*Professor Wang Cheng (left) leads partners on a tour of the State Key Laboratory of Terahertz and Millimeter Waves.*



# CENG shines at "Prototyping:" Exhibition

To celebrate its 10th anniversary, the Indra and Harry Banga Gallery at City University of Hong Kong (CityUHK) is hosting the "Prototyping:" exhibition. This unique showcase bridges the gap between innovative technology and art by presenting 23 technological inventions through artistic mediums across four immersive scenarios: Garden, Kitchen, Living Room, and Bedroom.

Among the exhibits are impressive contributions from the College of Engineering (CENG), which offer a glimpse into how advanced research is shaping the future of urban living. The exhibition prominently features the pioneering work of two of the College's distinguished scholars, **Professor Alex Jen** and **Professor Chan Chi-hou**, in the Living Room and Bedroom scenarios.

**Living room scenario**
The Living Room scenario invites visitors to sit in a space resembling a living room, featuring inventions such as a lighting fixture incorporating new-generation thin-film solar cells, tablecloths using smart food labelling technology, and Cloud Rock I, which blends natural eroded stones with stainless steel 3D-printed elements.

The new-generation thin-film solar cells, including perovskite-organic thin-film technology, are the creation of a team led by Professor Alex Jen, Department of Materials Science and Engineering. With superior mechanical flexibility and adjustable optical properties, this new type of solar cell can generate electricity under weak indoor light and collect surrounding light for electricity generation.

*The Living Room scenario*

**Bedroom scenario**
In the highly futuristic Bedroom scenario, visitors can explore a decade of antenna designs developed by the State Key Laboratory of Terahertz and Millimeter Waves. A major highlight here is the latest high-power terahertz radiation source chip, developed by a team led by Professor Chan Chi-hou, Vice-President (Community Engagement), Director of the State Key Laboratory of Terahertz and Millimeter Waves, and Chair Professor of the Department of Electrical Engineering.

This cutting-edge chip represents a massive leap forward for telecommunications. Its defining characteristics include a compact footprint and scalability, making it highly adaptable for future technological integration. The chip is expected to play a vital and foundational role in the deployment of ultra-high-speed 6G communications networks.

*Antenna designs developed over the past decade by the CityUHK State Key Laboratory of Terahertz and Millimeter Waves.*

By translating complex engineering achievements into tangible, everyday scenarios, the contributions of Professor Jen and Professor Chan at the "Prototyping:" exhibition perfectly illustrate the CENG's commitment to interdisciplinary collaboration and transformative, future-ready innovation.

*Content adapted from CityUHK NewsCentre*

# CityUHK student named one of Top 10 Outstanding International Students in Hong Kong 2025 in recognition of his social contribution and national commitment


*CityUHK doctoral student Mr Li (2nd from left) was selected as one of the Top 10 Outstanding International Students in Hong Kong 2025. He receives the award from CityUHK President Freddy Boey (2nd from right). (Photo credit: Young Expats Association)*

**Mr Li Guangda**, a doctoral student at City University of Hong Kong (CityUHK), has been selected as one of the Top 10 Outstanding International Students in Hong Kong 2025. The award recognises his outstanding achievements in academic research and professional development, as well as his contributions to social service, cultural heritage, community building and the promotion of youth exchange between the Chinese Mainland and Hong Kong.

**Mr Li Guangda** is currently pursuing a PhD in the Department of Architecture and Civil Engineering at CityUHK, supervised by **Professor Zheng Xing**. He also serves as the elected postgraduate student member on the University Council. He previously studied at Northeast Forestry University in the Chinese Mainland, Waseda University in Japan and The Hong Kong Polytechnic University. His academic work has been presented in various international competitions, journals and conferences.


*Mr Li (2nd from right) attends the 12th International Conference on Urban Climate in Rotterdam, the Netherlands with Professor Zheng (left).*

Over the years, Mr Li has been dedicated to supporting students from the Chinese Mainland studying in Hong Kong. As the current President of the Hong Kong Mainland Students Association, he helps Chinese Mainland undergraduate and postgraduate students integrate into the local community. Recently, he organised volunteer teams to support the election for the 8th term of the Legislative Council of the Hong Kong Special Administrative Region of the People's Republic of China, uniting Chinese Mainland students in Hong Kong to contribute to society.

Expressing his gratitude for the award, Mr Li said, "During my studies at CityUHK, I gained not only world-class, cutting-edge knowledge, but also a lifelong ability to explore, innovate, and think independently. I would like to express my heartfelt gratitude to my alma mater and to my beloved mentors, Professor Zheng, **Professor Tsou Jin Yeu**, **Professor Alvin Yip**, and Professor Li Wanxin. CityUHK's international environment has broadened my horizons and deepened my understanding of diverse cultures. I firmly believe that youth exchange can create valuable possibilities for young people. I will continue to give back to society with what I have learned and remain committed to connecting, serving and contributing."

*Mr Li (1st from right) participates in a relay race in the CityUHK Annual Athletic Meet's with hall mates.*

The award ceremony was held on 14 December 2025 at the CityUHK campus. **Professor Freddy Boey**, President and University Distinguished Professor of CityUHK, served as one of the officiating guests. In his speech, he noted that CityUHK has been named the "Most International University in the World" by Times Higher Education for two consecutive years (2024 and 2025). He emphasised the University's commitment to advancing internationalised education, supporting the HKSAR Government's promotion of the "Study in Hong Kong" initiative and providing students with a worldclass academic environment and multicultural atmosphere to nurture future leaders with global vision and social responsibility.

Organised by the Young Expats Association, the Top 10 Outstanding International Students in Hong Kong 2025 selected 10 awardees from more than 100 outstanding candidates representing over 10 higher education institutions in Hong Kong. The awards recognise the academic achievements of international and Chinese Mainland students and highlight their efforts to integrate into the Hong Kong community, contribute to local and Guangdong-Hong Kong-Macao Greater Bay Area development, and serve as bridges for international exchange. The programme further strengthens the "Study in Hong Kong" brand and supports the growth and development of students studying in the city.

*source: CityUHK NewsCentre*


*The award ceremony for the Top 10 Outstanding International Students in Hong Kong 2025 is held at CityUHK, with President Boey (front row, 5th from right) serving as one of the officiating guests. Also in attendance are Dr Christine Choi, Secretary for Education of the HKSAR Government (front row, 6th from left), and Mr Clement Woo, Under Secretary for Constitutional and Mainland Affairs (front row, 5th from left). (Photo credit: Young Expats Association)*

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