



CITY UNIVERSITY OF HONG KONG

Striving for excellence for the betterment of humanity

City University of Hong Kong is committed to pursuing excellent research, which will have an impact on all of society, including the lives of the next generation.

City University of Hong Kong (CityU) is ranked 57th in the 2015 QS World University Rankings, with 18 of its disciplines making the top 100 worldwide. According to data compiled by Shanghai Jiao Tong University for the Academic Ranking of World Universities 2015, CityU was ranked first in Hong Kong and Taiwan for engineering, technology and computer science, and mathematics. The university's College of Business came second in the Asia-Pacific region in the University of Texas at Dallas Top 100 Business School Research Rankings for 2010–2014. CityU is ranked tenth in the world (first in Hong Kong and Taiwan) for engineering and 57th in the world (first in Hong Kong) for economics and business, according to the Best Global Universities 2016 by US News & World Report.

Spearheading bold research initiatives

The Institute for Advanced Study (IAS) at CityU marks a new phase in innovative research in Hong Kong by world-leading scholars that will address critical global challenges. One of the few such centres in the region, it aspires to be an international centre of excellence for the advancement of technology and innovation. It intends to achieve this by bringing together an interdisciplinary team of world-renowned scholars and researchers including Nobel laureates Serge Haroche and Jean-Marie Lehn; Fields Medal recipients Pierre-Louis Lions and Stephen Smale; and Shaw Prize winner Frank Shu. Other academicians are serving as IAS senior fellows.

IAS will strive to extend the frontiers of knowledge and enhance its global outreach by integrating research capabilities informed by the sciences, technology and humanities to develop innovative solutions for human betterment. In addition, the institute will organize confer-

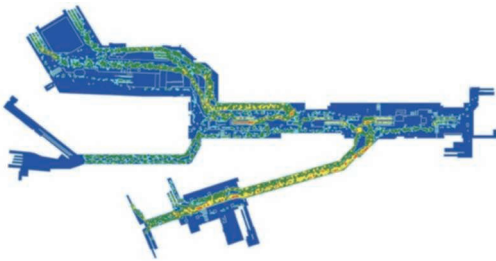
ences, symposiums and workshops to facilitate the exchange of ideas among academic communities in Hong Kong, mainland China and overseas.

A healthy and smart city

CityU was awarded two theme-based research project grants by Hong Kong's Research Grants Council to focus on themes of strategic importance to the long-term development of Hong Kong. The first project, Delivering 21st Century Healthcare in Hong Kong — Building a Quality-and-Efficiency Driven System, aims to develop an affordable and better local healthcare management system. It will focus on two areas: hospital resource planning and integrated elderly healthcare management using analytics. The cross-disciplinary team is led by CityU and is a collaboration with researchers from three other local universities and Columbia University in the USA, among others with expertise in management science, systems engineering and public health.

The other project is called Safety,

Reliability, and Disruption Management of High Speed Rail and Metro Systems. The complexity of large network systems for electricity transmission, passenger transport, supply chain management, Internet connectivity, finance and other applications is increasing at such a fast pace that it is difficult to ensure their safety, reliability and efficiency. Monitoring technologies have developed just as rapidly, generating large quantities of data. In response, Tsui Kwok-Leung from the Department of Systems Engineering and Engineering Management and his team aim to develop a platform of tools that will improve the safety and reliability of the Mass Transit Railway (MTR) and high-speed rail operators in Hong Kong. The project will also focus on ensuring the safe and efficient management of passenger capacity, demand, scheduling and pricing.



Applied research benefiting society

The mission of the State Key Laboratory in Marine Pollution is to develop technologies for combating marine pollution. Cheng Shuk Han and her PhD student Chen Xueping developed the world's first transgenic marine medaka fish assay for biomonitoring pollutants known as endocrine disruptors that interfere with the endocrine systems of mammals. In 2010, Xueping and Eric Chen teamed up to license the technology from CityU and established the start-up company Vitargent. This company now employs around 20 full-time staff members and was selected for the Technology Showcase Programme over the Past Decade by the Hong Kong government. In April 2015, Vitargent won the Grand Prix of the 43rd International Exhibition of Inventions of Geneva.

The State Key Laboratory of Millimeter

Waves, approved by the Ministry of Science and Technology (MOST) of China in March 2008, is the first such research laboratory among engineering disciplines in Hong Kong. The laboratory aims to develop new millimetre-wave and terahertz technologies for applications in areas such as antenna design, radio-frequency integrated circuit (RFIC) design, multiple-input multiple-output (MIMO) systems, microelectromechanical systems (MEMS), novel materials, micromachining, biosensing, bioimaging and spectroscopy.

Recently, MOST approved the establishment of the Hong Kong branch of the National Precious Metals Material Engineering Research Centre at CityU. This centre will be jointly established with the National Research Centre for Precious Metal Materials and Engineering Technology at the Kunming Institute of Precious Metals. It will receive annual funding from the Innovation and Technology Commission of the Hong Kong SAR government for recruiting researchers and buying the latest equipment. The Hong Kong branch will promote research and application of precious metal elements and nanomaterial engineering technology as well as provide professional training and academic exchange.

Nanosteel and atomic probe

Liu Chain-Tsuan, a university distinguished professor at CityU, along with scientists from four local universities, used government grants to purchase a three-dimensional atom probe tomography system (LEAP 5000) from CAMECA. It can analyse nanoscale particles as small as 0.3–0.5 nanometres, enabling scientists to precisely determine the size, shape, composition and structure of particles. This data will help them to improve the microstructures and properties of advanced materials and develop new materials to meet the needs of today's society. The nanosteel technology developed was licensed to a steel company for industrialization.

Structural safety for skyscrapers

Qiusheng Li of the Department of



Architecture and Civil Engineering became the first Chinese scholar to receive the 2016 Jack E. Cermak Medal from the American Society of Civil Engineers. This is the highest honour in the field of wind engineering and industrial aerodynamics. By combining and applying field measurement, wind-tunnel testing, numerical simulations and theoretical analysis, Li and his team have made significant contributions to enhancing building safety through the systematic study of boundary-layer wind characteristics and wind effects on structures. His team has developed wind and structural health monitoring systems, which have been installed in a number of super-tall buildings, including the Ping An International Finance Centre in Shenzhen (640 metres high), International Finance Centre Two in Hong Kong (420 metres), Citic Plaza in Guangzhou (390 metres) and Guangzhou West Tower (432 metres).



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