

The banner features a blue-tinted background image of a large, modern stadium or arena with a curved roof. Overlaid on this image is the text "HKUST SCIENCE AND TECHNOLOGY FORUM" in a large, bold, white, sans-serif font. Below it, "Executive Summary" is written in a smaller, white, serif font.

HKUST SCIENCE AND TECHNOLOGY FORUM

Executive Summary

**“Science and Technology: Innovation for the Future of Hong Kong”
and
“Guangzhou’s ‘12th Five-year Plan’: Integration of Hong Kong and the Pearl River
Delta”**

1-2 December, 2011

1. Background

- 1.1** In celebration of the University’s 20th Anniversary, the Hong Kong University of Science and Technology (HKUST) together with the Hong Kong Academy of Engineering Sciences (HKAES) and the Hong Kong Institution of Science (HKIS) co-organized the first ever high-powered Science and Technology Forum in Hong Kong on 1-2 December 2011 with participation from leading experts from academia, industry and government to discuss the way forward for developing innovation and technology in Hong Kong and strengthening the collaboration between Hong Kong and the Pearl River Delta region.
- 1.2** In 2010, the Hong Kong Special Administrative Region Government revisited its role in promoting economic development after the global financial crisis, and decided to make special efforts to encourage the growth of six industries. Hong Kong is in a critical juncture to maintain and enhance its competitiveness in the wake of rapid economic development of Mainland China, as well as other Asian countries. At the same time, the Framework Agreement on Hong Kong/Guangdong Cooperation signed in April 2010 translated the macro policies for the reform and development of the PRD into concrete measures conducive to the development of both places. China’s 12th Five-Year Plan for National Economic & Social Development promulgated in March 2011 also dedicated a chapter to Hong Kong to elaborate on the significant functions and positioning of Hong Kong in the development strategy of the country.
- 1.3** On its 20th anniversary, the University while formulating a five-year Strategic Plan, found it most opportune to take stock of our achievements and challenges, its Mainland initiatives, and to stimulate thinking on ways to make even greater contributions to the economic and social development of Hong Kong and the region.
- 1.4** Against this background the Science and Technology Forum was held to provide a platform for the exchange of analyses, insights and innovative ideas among international, Mainland and Hong Kong leaders and scholars. The Forum lasting for two days was held in Sheraton Hotel Hong Kong and HKUST Fok Ying Tung Graduate School at Nansha respectively. The first day of the Forum with the aim to recommend a roadmap for Hong Kong’s science and technology

policy, key issues for innovation, and development of science and technology centred on the theme of “Science and Technology: Innovation for the Future of Hong Kong”. The second day was on “Guangzhou’s ‘12th Five-year Plan’: Integration of Hong Kong and the Pearl River Delta” with a view to enhance our competitiveness by tapping into opportunities for Mainland-Hong Kong technology collaborations in the context of China’s 12th Five-year Plan.

- 1.5 To provide the context and facilitate discussion, all speakers, panelists and moderators of the forum were given the relevant background information (see two position papers from the <http://st-forum.ust.hk/hkaes.html> and <http://st-forum.ust.hk/hkis.html>), as well as the issues posed for discussion as listed below:
- What are the key science and technology policy issues for research and innovation development in Hong Kong?
 - What are the opportunities and the way forward for the government, universities and industry?
 - Research capacity and support
 - Industrial participation
 - Administrative infrastructure
- 1.6 The two-day Forum has attracted over 500 participants. Over 20 keynote speeches, dialogue sessions and panel discussions are presented with cross-sectoral experts from China, the US and Hong Kong on themes such as innovative education and science and technology policy recommendations. The purpose of this paper is to summarize the two-day programme, the key issues discussed at the forum and the recommendations made.

2. Programme

“Science and Technology: Innovation for the Future of Hong Kong” held on 1 December 2011 at Sheraton Hotel, Hong Kong

- 2.1 The first day of the forum focused on the role of university and government in science and technology in the Hong Kong and international contexts. The Forum was opened by Dr the Hon Marvin K T Cheung, Chairman of the University Council, HKUST, who delivered a welcoming speech, followed by four keynote lectures chaired by Prof Joseph H W Lee, Vice-President for Research and Graduate Studies, HKUST.
- 2.2 The keynote lectures were delivered by the following four outstanding overseas and local leaders:
- Prof Arden L Bement Jr, Director of Purdue University's Global Policy Research Institute and Former Director of US National Science Foundation who spoke on the role of government in science and technology policy, globalization of R&D and challenges to Asia and other countries;
 - Dr Yen-shiang Shih, Minister of Economic Affairs and Board Member of Commerce Development Research Institute, Taiwan on a journey to the knowledge economy;
 - Prof Wang Zhongtuo, Academician of the Chinese Academy of Engineering and Director of Research Center for Knowledge Science and Technology in Dalian University of

Technology who addressed the importance of R&D in a knowledge economy and the roles of enterprise, academia and government; and

- Prof Tony F Chan, President of the HKUST on the role of a research university of science and technology in knowledge society.

2.3 The luncheon dialogues, moderated by Prof Chia-wei Woo, Founding President of HKUST, drew insightful discussions from science and technology leaders including Mr Chun-ying Leung, Former Convenor of the Non-official Members of the Executive Council of the Hong Kong SAR Government; Ir Dr the Hon Raymond Chung-tai Ho, Member of the Legislative Council; Prof France A Córdova, President of Purdue University as well as President of the National Science Board, USA.

2.4 The Forum also witnessed the presentation of the first ever HKUST Technology Industry Innovation Award. To recognize the efforts of a high-achiever in the technology or engineering industry and to further promote the importance of innovation in the 21st century, HKUST presented the inaugural HKUST Technology Industry Innovation Award to Mr Ma Huateng, Chairman and CEO of Tencent Holdings Limited in recognition of his success in commercializing innovative ideas and the positive impacts on society. Mr Ma, in return, delivered a speech on "Reflections on the Innovation and Entrepreneurship of the IT Industry in China".

2.5 The panel discussion in the afternoon of the forum focused on the theme: "Science and Technology Policy for Hong Kong: Innovation, Entrepreneurship, and Commercialization". The discussions were held in two sessions chaired respectively by Prof. Otto Lin and Prof. Y L Choi, both Fellows of the Hong Kong Academy Engineering Sciences. A distinguished team of society leaders, academics and entrepreneurs shared their experience and delivered stimulating talks:

Session I

- Mr Sing-Cheong Liu, Chairman of My TopHome (China) Holdings Ltd
- The Hon Mrs Regina Ip Lau Suk-ye, Member of the Legislative Council, HKSAR
- Mr Nicholas Brooke, Chairman of the Hong Kong Science and Technology Parks Corporation
- Prof Yuk-shan Wong, Fellow of the Hong Kong Institution of Science

Session II

- Dr York Liao, Co-founder and Executive Director of Varitronix International Ltd
- Ir Dr the Hon Samson Wai-ho Tam, Member of the Legislative Council, HKSAR
- Dr Nim-kwan Cheung, CEO of the Hong Kong Applied Science and Technology Research Institute
- Prof Matthew Yuen, Head of Department of Mechanical Engineering, HKUST

2.6 The first day of the forum ended up with a concluding session wrapping up the reflections of the discussion and talks, and finalizing the recommendations on the development of science and technology in Hong Kong. The details of the recommendations are presented under Section 3 of this report.



HKUST Council Chairman Dr. Marvin Cheung delivered a welcoming speech.



Fellows of Hong Kong Academy of Engineering Sciences and Hong Kong Institution of Science took part in the S&T Forum.



Distinguished speakers and senior management of HKUST at the Science & Technology Forum.



Dialogue with Science and Technology Leaders: (from the left) Prof Chia-wei Woo, Ir Dr the Hon Raymond Chung-tai Ho, Prof France A Córdova and Mr Chun-ying Leung.



Mr Huateng Ma (center) receiving the HKUST Technology Industry Innovation Award from Prof Tony F Chan. On the right is Prof Khaled Ben Letaief, Dean of Engineering at HKUST.

“Guangzhou’s ‘12th Five-year Plan’: Integration of Hong Kong and the Pearl River Delta” held on 2 December 2011 at HKUST Fok Ying Tung Graduate School in Nansha

- 2.7** The second day of the Forum titled “Guangzhou’s ‘12th Five-Year Plan’: Integration of Hong Kong and the Pearl River Delta” was held at HKUST Fok Ying Tung Graduate School in Nansha on 2 December 2011. Before the official opening of the forum, a tour of Nansha and the Exhibition Hall of the Nansha Government was arranged for all participants to give them some background on the rapid development of Nansha.
- 2.8** The second day of the forum was officiated by the HKUST President Tony F Chan, Ms Wang Yan, Vice Chief, MOST China Science and Technology Center, Mr Li Xinghua, Director of Guangdong Provincial Department of Science and Technology, Ms Gong Erzhen, Vice Mayor of Guangzhou Municipal Government, Mr Xie Xuening, Director of Guangzhou Science and Information Technology Bureau, Mr Qu Shaobing, Director of Guangzhou Education Bureau, together with Mr Yuan Guiyang, Director of Nansha District Government of Guangzhou. To express gratitude to members of the Fok Ying Tung Foundation for their continuous and ardent support, Prof. Tony F Chan presented a souvenir to the Fok’s Foundation.
- 2.9** Two keynote presentations were given by Mr Wong Shuwu, Director of Nansha Development and Reform Bureau, on “Guangzhou’s Twelfth Five-year Plan” and Miss Janet Wong Wing-chen, Commissioner for Innovation and Technology of HKSAR, on “Hong Kong – the Place Where East Meets West in the Promotion of Innovation and Technology” respectively.
- 2.10** The Nansha Forum also featured the signing of a memorandum of understanding on science and technology cooperation with the Bureau of Science, Technology and Information of Guangzhou Municipality, the launch of the University’s ‘Smart Green Building’ project and the establishment of The National Engineering Research Center for Industrial Automation (South China) which all amplified HKUST’s long-term development plans and commitment on the Mainland.
- 2.11** The afternoon session, chaired by Mr Sing-Cheong Liu, Chairman of My TopHome (China) Holdings Ltd, showcased success stories of science and technology related Hong Kong entrepreneurs. Many of whom are HKUST alumni:
- Mr Arthur Chow, Co-founder & Chief Operating Officer, 6waves
 - Dr Jack Lau, Chairman & CEO, Perception Digital Ltd
 - Dr Winnie Tang, President, Internet Professional Association (iProA)
 - Prof Albert Yu, Chairman & CEO, Hai Kang Life Corporation Ltd
 - Dr David Xiao, Managing Director, Advanced Photoelectronic Technology Ltd
 - Prof Cliff C K Chan, Founder & CEO, the TeleEye Group
 - Mr Lo Wing Keung, Creator of animated series “Pleasant Goat and Big Big Wolf”
- 2.12** Moderated by Mr Zhan Decun, Vice Director of Guangzhou Science and Information Technology Bureau and Mr Wong Shuwu, Director of Nansha Development and Reform Bureau, the forum was opened for interaction with all participants for fruitful sharing and

discussion. The forum ended with a wrap up session by Prof Joseph H W Lee to summarize the sharing at the forum and to portray the future initiatives.



Representatives from Guangdong, Guangzhou, Nansha and Hong Kong SAR governments, Fok Ying Tung Foundation, HKUST and two Chinese scholars at the HKUST Science and Technology Forum Series in Nansha.



Miss Janet Wong Wing-chen delivering a keynote presentation on “Hong Kong – The Place Where East Meets West in the Promotion of Innovation and Technology”



The establishment of The National Engineering Research Center for Industrial Automation (South China) amplified HKUST's long-term development plans and commitment on the Mainland.



Distinguished guests witnessed the launch of HKUST's “Smart Green Building” project.

2.13 The two-day forum has addressed the Government’s concern on science and technology innovation and policy and also to bring HKUST members, HKSAR Government officials, society leaders to Nansha to deepen their understanding of Nansha development. A detailed programme of the two-day forum is available at <http://st-forum.ust.hk> .

3. Issues

3.1 Economic Background

- In the past, Hong Kong has been too over-reliant on the financial and property market which resulted in a narrow economic based structure. As Mainland China is in the

process of upgrading its economic activities, Hong Kong must find a new role and a market niche in the context of the world economies and China. Compared with other Asian Tigers and other high-cost-economy-based countries, Hong Kong has taken a rather long journey to build a knowledge-based economy. This is partly due to the government's lack of policy in science and technology, which resulted in Hong Kong missing the golden opportunity of transforming a labour-intensive to the technology-based industries in early 1980s. The latest 12th Five-year Plan and the Framework Agreement on Guangdong-Hong Kong provides a chance for Hong Kong to leverage on China's national plan to make S&T a key component of national development and to recapture the missed opportunity which should have been available in early 1980s.

3.2 Science and Technology policy

- The role of government in science and technology policy will have utmost impact in enhancing the global competitiveness of Hong Kong. Industrial policymaking has traditionally been limited in Hong Kong. The lack of coordinated preparation and government leadership for technology-based economy, in terms of R&D investment, training and policy development has left Hong Kong far behind other economies. While the HKSAR Government now has a mandate from the LegCo to look into the proposed Innovation and Technology Bureau, it is yet a long way to become a full policy bureau. At present, Hong Kong's cooperation with Mainland is restricted by the differences in systems and absence of a clearly stated science and technology policy.

3.3 Research and development

- A country's priority in science and technology always has a determining effect on resource support. "Funding for science and technology will always be a scarce resource,..." as pointed out by Prof. Arden L Bement Jr, Former Director of National Science Foundation, USA, in his keynote speech on the first day of the Forum, "... some realism is needed in deciding those fields of science and engineering in which a nation should aspire to be a global leader and those in which it decides to be a 'fast follower.'"
- In Hong Kong's 2009-10 Policy Address "Breaking New Ground Together", it has stated that the six industries, one of which was innovation and technology, were crucial to the development of Hong Kong's economy. In 2011-12 Policy Address "From Strength to Strength", innovation and technology continued to be a focal point of development.

The Government has reserved about two hectares of land in Tseng Kwan O for data centre use and encouraged the local industry to develop advanced cloud computing technologies and applications. Obviously, the science and technology has an emerging priority in government planning. Nevertheless, is the resource provided for research and development sufficient for the transformation of a knowledge-based economy?

- Prof. Tony Chan, President of HKUST, has quoted the R&D investment in other Asian countries for comparison with the case in Hong Kong in his keynote speech. Korea is spending 3% of its GDP on R&D and Singapore's spending rose from 1.9% in 1990 and

to the current 3% and will rise to 3.5% in 2015 while Hong Kong's R&D investment is the lowest among the four Asian Tigers at just 0.79%. Shall we bear the risk of falling behind without sufficient resources support in R&D?

3.4 Education and human resources

- Traditionally, Hong Kong education has been geared to training technical professionals, rather than enterprising and innovative all-rounders. Since science and technology has become the primary productive force and powerful driving force for sustained economic and social development, the key factors of our competitiveness are capability for innovation, the industrialization of technology and most importantly, we have the talents to bring in new ideas and implement their innovations.
- Universities are often at the vanguard in ushering innovation. This is especially true for HKUST which was formed with the future in mind. The role of universities is no longer confined to a passive transmission of knowledge, but the active creation of new knowledge. Through the research experience and real practice, our future generation has to learn to challenge fundamental assumptions, tackle problems with unknown formulations and develop their own solutions in encountering difficulties.

3.5 Collaborations

- Innovation networks between Industry-Academia- Government (IAG), namely the Triple-Helix Model of Collaborative Innovation has been in place in many parts of the world. In innovation collaboration, the tripartite interface and bring along synergetic effects. Different kinds of interface organizations will be set up such as joint research centre, incubator, and productivity promotion organization. Some of these interface organizations are located in enterprises and some are located in universities. To further develop win-win collaborations with Mainland China in order to leverage on China's substantial S&T investment and talents, a government-led and centrally coordinated effort is essential to enhance our competitiveness in this fast-moving world.

4. Recommendations

4.1 Enhance Administrative Infrastructure for Science & Technology

- Hong Kong SAR should set clear S&T policy to enhance the global competitiveness of Hong Kong
- Establish a S&T Policy Bureau and Secretary for S&T to support S&T related policy decisions. Actively facilitate mainland-HK S&T collaborate to re-capture missed opportunities
- Integrate leading academies of science/engineering into the government's policy formulation mechanism

4.2 Enhance Support for Research and Innovation Capacity

- Enhance the promotion of excellence in science, engineering, innovation, entrepreneurship, and commercialization.
- Increase government research funding support to national level; provide incentives to encourage private sector support of R&D.
- Boost integration with PRD cities and develop major projects;
- Establish university policy to foster and facilitate HK-mainland research collaboration

4.3 Enhance Innovation and Technology Platform

- Establish joint government-university research institutes and R&D projects with minimal government micro-management
- Enhance a Hong Kong innovation system to enable closer interaction among government-industry university- technology institute
- Boost integration with PRD cities and develop major projects;
- Develop specific action plans to promote strategic technologies – to address emerging needs (e.g. new life styles, green industry), to support regional development, economic growth and employment opportunities.

5. Conclusion

The forum has provided an interactive platform for experts and participants from various sectors to exchange their thoughts and experiences on the development of innovation and science and technology policy, to explore ways to further the cooperation between Mainland and Hong Kong, and to promote innovation in the development of technology and its commercialization. The issues and recommendations contained in this report will serve as a reference for the Government and the business community, and need to be further examined.