

## SYMPOSIUM ON INNOVATION & TECHNOLOGY 創新科技論壇

### REVIVE & THRIVE 生機展現 邁步向前

- Date 日期 : 27 / 10 / 2021 (Wednesday 星期三)
- Time 時間 : 10:30am – 4:10pm / GMT+8
- Venue 地點 : The STAGE, Hall 1E, Hong Kong Convention and Exhibition Centre & Online Streaming 香港會議展覽中心展覽廳 1E The STAGE 及 線上直播
- (Attendants are welcomed to participate the event in either format 歡迎參會人士以親身或網上形式出席)
- Language 語言 : English and Putonghua (With simultaneous interpretation service) 英語及普通話 (附設即時傳譯服務)
- Remarks 備註 : Free admission (Please scan the QR Code to register online) CPD Available 免費登記 (請掃描二維碼登記), 可申請持續進修學分

Souvenir Redemption is available for onsite attendants

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	TOPICS 題目
<b>AM SESSION</b>	
10:30AM – 10:33AM	<b>Welcome Remarks by Mr Victor Choi, Chairman, Hong Kong Electronics &amp; Technologies Association</b> 香港電子科技商會主席 蔡劍誠先生致歡迎辭
10:33AM – 10:38AM	<b>Opening Remarks by The Honorable Alfred Sit Wing-hang, JP, Secretary for Innovation and Technology</b> 香港創新及科技局局長 薛永恒 JP 致開幕辭
10:38AM – 10:40AM	<b>Group Photo</b> 嘉賓合照
10:40AM – 11AM	<b>Innovation and Technology Outlook for Hong Kong</b> Mr Marcos Chow, Partner & Head of Technology Enablement, KPMG China 畢馬威中國香港技術驅動主管合夥人 周嗣良先生
11AM – 11:20AM	<b>The 6G Gearbox PHY Idea</b> Professor Gerhard Fettweis, PhD, Vodafone Chair Professor Dresden University of Technology, Germany 德國德累斯頓工業大學
11:20AM – 11:40AM	<b>Looking to 6G and the wireless future in 2030 – The move to Sub-Terahertz mobile communications</b> Professor Theodore S. Rappaport, David Lee/Ernst Weber Professor, New York University (NYU), United States 美國紐約大學
11:40AM – 12NN	<b>The new era of Fintech with integrated blockchain</b> 綜合區塊鏈的金融科技新時代 Dr Lucas Hui, Chief Technology Officer, ASTRI 香港應用科技研究院首席科技總監 許志光博士

<p><b>12NN – 12:45PM</b></p>	<p><b>Panel Discussion</b> Moderator: Dr Nim Cheung, Chairman, Symposium on Innovation &amp; Technology Organising Committee  Panellists: Speakers of the Symposium (Both AM &amp; PM Sessions)</p>
<p><b>PM SESSION</b></p>	
<p><b>2:30PM – 2:50PM</b></p>	<p><b>Internet-of-Intelligent-Things in the Era of 6G – Several Key Technology Challenges</b> 面向 6G 的智能物聯網：若干關鍵技術挑戰 Dr Wai Chen, Chief Scientist, China Mobile Research Institute 中國移動研究院首席科學家 陳維博士</p>
<p><b>2:50PM – 3:10PM</b></p>	<p><b>Clean Energy – Heading Towards Carbon Neutrality</b> Ir John Chan, Director, Technical Services, CLP Power Hong Kong 中華電力有限公司技術服務總監 陳君穎先生</p>
<p><b>3:10PM – 3:30PM</b></p>	<p><b>Accelerated Machine Learning: What Comes Next?</b> Professor Wayne Luk, Faculty of Engineering, Department of Computing, Imperial College London, United Kingdom 英國倫敦帝國學院</p>
<p><b>3:30PM – 3:50PM</b></p>	<p><b>Wireless Power: Current Status and Future Trend</b> Professor Ron Hui, School of Electrical and Electronic Engineering, Nanyang Technological University, Singapore 新加坡南洋理工大學</p>
<p><b>3:50PM – 4:10PM</b></p>	<p><b>The New Space Era: An Overview</b>  Dr Stephen W. Cheung, Adjunct Professor of Physics, The University of Hong Kong / International Council Member, Orion Astropreneur Space Academy-Hong Kong 香港大學物理系客座教授 / 創星滙(香港)國際理事會成員 張華坤博士</p>

## CPD Applications 持續進修專業學分申請

- 3.5 hours of CPD would be obtained for participants who have attended the event on time in both AM & PM sessions.  
準時出席論壇上午及下午兩節之觀眾將可獲得 3.5 小時持續進修專業學分。
- The CPD credits are to be endorsed by the Hong Kong Electronics & Technologies Association (HKETA). Applicants agreed to share the name and email with the HKETA under such practice. 是次論壇之持續進修專業學分由香港電子科技商會頒發。申請者需同意其登記姓名及電郵資料將被分享至其會中資料庫。
- Upon the event completion, the CPD certificates will be distributed via email. Please ensure the name and email address used to access the webinar are correct as they will be served as the information to issue the certificate.  
持續進修專業學分證書將於論壇完結後以電郵發送至各申請人。敬請 閣下確保在登入論壇時所輸入之姓名及電郵地址無誤，以便妥發證書。

### Supporting Organisations:

Automotive Platforms and Application Systems R&D Centre  
Business Environment Council  
City University of Hong Kong - Department of Electronic Engineering  
GS1 Hong Kong  
Hong Kong Applied Science and Technology Research Institute Company Limited  
Hong Kong Baptist University)  
Hong Kong Cyberport  
Hong Kong Electronics Industry Council  
Hong Kong IoT Alliance  
Hong Kong Medical and Healthcare Device Industries Association  
Hong Kong Metropolitan University  
Hong Kong Productivity Council  
Hong Kong Science and Technology Parks Corporation  
Hong Kong Wireless Technology Industry Association  
IEEE Hong Kong Section  
IVE - Engineering Discipline  
Lingnan University  
Logistics and Supply Chain MultiTech R&D Centre  
Nano & Advanced Materials Institute  
Smart City Consortium  
The Chinese University of Hong Kong - Department of Electronic Engineering  
The Education University of Hong Kong  
The Hong Kong Electronic Industries Association Limited  
The Hong Kong Information Technology Federation  
The Hong Kong Institution of Engineers (Electronics Division)  
The Hong Kong Polytechnic University - Department of Electronic & Information Engineering  
The Hong Kong Research Institute of Textiles and Apparel  
The Hong Kong University of Science & Technology - Department of Electronic & Computer Engineering  
The Information and Software Industry Association  
The Institution of Engineering and Technology  
The University of Hong Kong - Department of Electronic & Electrical Engineering

**Mr Marcos Chow****Partner & Head of Technology Enablement, KPMG China**

畢馬威中國香港技術驅動主管合夥人 周嗣良先生

**About the Presentation**

It has been about 18 months since the World Health Organization declared a global pandemic, and strategies and concerns have shifted during these demanding times. Globally CEOs are confident in the growth prospects of their company and the global economy in general. Today's connected CEOs are plugged-in, people-first and purpose-led. Overall, three themes emerged: the road to renewal and leaders' optimism about the path to growth, the importance of following through on a trusted purpose by driving bold environmental, social and governance (ESG) programs, and the determination of CEOs to instill new levels of digital agility.

Locally in Hong Kong, we have also seen similar optimism as economists have raised their growth forecasts for Hong Kong by 0.7 percentage points to 6.7% this year. Hong Kong improved its ranking to 3rd in the Global Financial Centres Index 2021, rising by one place and only behind New York and London, rose from eight to fifth in the World Digital Competitiveness Ranking 2020, and from 13th to 11th in the Global Innovation Index 2020.

Furthermore, 14th Five-Year Plan continues to support Hong Kong to enhance its status as an international financial, transportation and trade centre; strengthen its status as a global offshore Renminbi business hub, an international asset management centre and a risk management centre; establish itself as a centre for international legal and dispute resolution services in the Asia-Pacific region; and promote service industries for high-end and high value-added development and Hong Kong's aim to achieve net carbon zero emissions by 2050. All these initiatives and the continuous investments by the government and venture capitals have continued to make Hong Kong one of the most attractive places to be to nurture and develop leading edge talent and companies in the areas of innovation and technology.

**About the Speaker**

Marcos is the Head of Technology Enablement practice and Head of Emerging Technology industry in Hong Kong. He and his team help organisations accelerate their digital transformation journey. He takes an interest in the development of China's Greater Bay Area and Smarter Cities.

He has over 19 years of experience in technology leadership roles across Australia, ASEAN, Greater China and USA. He was part of a Cloud/Software as a Service start-up in 2005, where the start-up raised USD 26M. His prior experience also includes being the General Manager of a Global Delivery Center in Shenzhen with over 2500 staff and responsible for the Greater China cloud consulting business for a leading consulting firm with over USD56M in revenue per year.

Marcos represents KPMG in a number of associations such as Asia Securities Industry & Financial Markets Association, Australian Chamber of Commerce (Hong Kong), Fintech Association of Hong Kong, and Malaysian Chamber of Commerce (Hong Kong & Macau)



## Representative Clients

- Led an engagement to write a Innovation & Technology policy paper focusing on the next 10 to 20 years for the government
- Led the engagement for a Hong Kong Note issuing bank, where he and his team developed the bank's 3 year (2019- 2022) IT strategic plan for Hong Kong and South East Asia
- Led an engagement to help a luxury watch maker embrace the cloud as part of their global core systems replacement and had accountability for Mainland China, Hong Kong, Philippines and Taiwan markets.
- Helped a leading US investment bank to use a build-operate-transfer model instead of a joint venture (as the bank intended) to build front office equities trading capabilities. Successfully delivered this 6-year transformation program.
- Led a team of 220 consultants to deliver a wide range of projects in the areas of Big Data, Cloud Advisory, Cloud Development, Cloud Migration, Complex Systems Integration and Architecture, and Security.

Led the creation of the digital & interactive experience studios in Shanghai (2015) and co-led the creation of the Dalian Studio (2017) which is 3x larger. Where Shanghai Studio is home to UX/UI designers, focused on the customer experience, Dalian Studio is the home to data scientists, agile engineers and coaches working on AI, Block-chain, Big Data, Cloud and Internet of Things.

## Prof Gerhard Fettweis, PhD

Vodafone Chair Professor Dresden University of Technology, Germany

德國德累斯頓工業大學

### About the Presentation

We experienced the need for a new physical layer (PHY) of the radio access network when moving from 1G to 2G cellular, as well as from 3G to 4G. Not, however, moving from 2G to 3G and 4G to 5G. In this context 6G needs a fresh look, and there are very good reasons for doing so. In this talk we want to present a novel idea: the Gearbox PHY. It addresses one of the most pressing challenges, the reduction of energy consumption and therefore also cost of operation.

The idea was first proposed in <https://ieeexplore.ieee.org/document/9568233>. This talk presents some more detailed background on the line of argument.



### About the Speaker

Gerhard P. Fettweis, F'09, earned a Ph.D. under H. Meyr at RWTH Aachen in 1990. After a postdoc at IBM Research, San Jose, he joined TCSI, Berkeley, USA. Since 1994 he is Vodafone Chair Professor at TU Dresden, Germany. Since 2018 he additionally heads the new Barkhausen Institute. 2019 he was elected into the DFG Senate (German Research Foundation). He researches wireless transmission and chip design, coordinates 5G++Lab Germany, spun-out 17 tech and 3 non-tech startups, and is member of the German Academy of Sciences (Leopoldina), and German Academy of Engineering (acatech).

**Prof Theodore S. Rappaport****David Lee/Ernst Weber Professor, New York University (NYU) 美國紐約大學****About the Presentation**

This talk will look at the recent global interest and accomplishments that are pushing mobile communications to the frequencies above 100 GHz. Recent regulatory developments, combined with growing engineering knowledge and confidence in today's 5G millimeter wave technology, will lead the way for wireless networks in the coming two decades. With the move to Terahertz spectrum, wireless will, in the next 15 years, allow real-time data communications at the rate of the human brain, unleashing new applications never before imagined.

**About the Speaker**

Theodore S. Rappaport is the David Lee/Ernst Weber Professor at New York University (NYU) and holds faculty appointments in the Electrical and Computer Engineering Department, the Courant Computer Science Department, and the NYU Langone School of Medicine. He founded NYU WIRELESS, a multidisciplinary research center, and the wireless research centers at the University of Texas Austin (WNCG) and Virginia Tech (MPRG). His research has provided fundamental knowledge of wireless channels used to create the first Wi-Fi standard (IEEE 802.11), the first U.S. digital TDMA and CDMA standards, the first public Wi-Fi hotspots, and more recently proved the viability of millimeter-wave and sub-THz frequencies for 5G, 6G, and beyond. He is a member of the National Academy of Engineering, is a Fellow of the National Academy of Inventors, and was elected to the Wireless History Foundation Hall of Fame in 2019.

**Dr Lucas Hui****Chief Technology Officer, ASTRI**

香港應用科技研究院首席科技總監 許志光博士

**About the Presentation**

Blockchain is playing an increasingly vital role in developing a vibrant digital economy and, enabling a well-functioning smart city. Alongside with the development of 5G/6G, the high communication bandwidth can support various devices and client terminals and increase the speed of data communication; low latency can benefit the FinTech development in handling large number orders from the devices at the same time. Blockchain then serve as a key to ensure fraud transaction prevention, data encryption, thus to reinforce the security of Fintech application.

This talk will share the integration of 5G, IoT, AI technologies enhanced by blockchain, which leveraging both enterprises and clients, and providing a more secure and safer digital experience. How blockchain reshapes the traditional financial industry and build a new Fintech ecosystem.



區塊鏈在推動數碼經濟、建設完善的智慧城市上，擔任著越來越重要的角色。隨著 5G/6G 的發展，高通訊頻寬可以支援各種設備和客戶端，提高數據通訊速度；其低時延的特點，可以同時處理來自不同裝置的大量訂單，有助推動金融科技的發展。區塊鏈藉此成為防止虛假交易及數據加密的關鍵，增強金融科技應用的安全性。

本次演講將分享由區塊鏈增強 5G、物聯網、人工智能等技術的整合，為企業和客戶，提供更保險及安全的數碼體驗。區塊鏈如何重塑傳統金融行業，創建新的金融科技生態系統。

### **About the Speaker**

Dr Hui is the Chief Technology Officer of ASTRI. He has over 30 years of experience in the field of research, consulting, and teaching. He is an internationally renowned expert in applied research in cybersecurity, data sciences and trust management, with vast leadership experience in collaborative projects in complex, multi-stakeholder situations across technological, organizational and geographical boundaries.

Dr Hui is a pioneer in Information Security research in Hong Kong, with extensive connections in Greater China as well as internationally. Before joining ASTRI, he was a faculty member at the University of Hong Kong (HKU) for nearly 20 years and founded the university's Centre for Information Security and Cryptography. He also taught at the National University of Singapore (NUS). He has been a delegate, speaker, or panellist at numerous international conferences and workshops, and has over 200 papers attributed to him in international publications and journals. He was on the Steering Committee of ASIACRYPT – a top international conference in cryptography – and had hosted international conferences in Hong Kong.

許志光博士是香港應用科技研究院首席科技總監，在科技研發、專業顧問和高等教育方面擁有超過 30 年經驗。他在國際享負盛名，是信息安全、大數據分析、可信技術管理等領域的專家。他在管理涉及多方協作的科研項目上，包括跨技術、跨機構、跨地域合作，擁有卓越的領導能力和經驗。

作為香港領先的信息安全科研專家，許博士在大中華地區及國際上擁有廣闊的網絡。加入應科院前，他在香港大學計算機科學系任教近 20 年，創立了香港大學資訊保安及密碼學研究中心。他也曾在星加坡國立大學任教。許博士多次在國際學術會議發表演說或參與專家討論，並在國際期刊及會議上發表了逾 200 篇論文。他亦曾擔任亞密會（ASIACRYPT，世界三大密碼學國際學術會議之一）指導委員會成員。

### **Dr Wai Chen**

**Chief Scientist, China Mobile Research Institute**

中國移動研究院首席科學家 陳維博士

### **About the Presentation**

6G is expected to bring networking technologies with higher throughput, massive connections, and pervasive coverage in highly-dynamic environments to fulfill diverse application requirements. It is believed that AI will be a central driver in the evolution towards 6G, and 6G will enable a new generation of Internet-of-Intelligent-Things (IoIT) applications that require ultra-low delay and ultra-high reliability, such as future intelligent transport systems (ITS) and smart cities. Such IoIT applications will likely depend on intelligent agents to dynamically collaborate on massive scales to solve complex distributed challenges.

This talk will first give a high-level view of IoIT and highlight two R&D directions of future developments: network optimizations and intelligent services. This will be followed by an overview of several technical fields involved in the IoIT such as the new machine



learning paradigm, the knowledge map technology and the heterogeneous collaborative computing architecture which all need further technical breakthroughs. The talk will then highlight major challenges, in network optimizations as well as in intelligent services, with potential uses of machine intelligence.

6G 技術將提供更高的速率、更多的連接，以及更廣的網絡覆蓋，以滿足在高度動態環境中的各類應用需求。人工智能（AI）是推動 6G 不斷演進的核心技術，而 6G 也將會使能一系列需要超低時延、超高可靠的未來智能物聯網應用（Internet-of-Intelligent-Things, IIoT），如未來智能交通系統（Intelligent Transport Systems, ITS）、智慧城市等，這些應用將依賴于多智能體協作技術實現分布式複雜任務。

本次報告從智能物聯網的概念入手，重點提出關於智能物聯網的兩個前沿研究方向，一是網絡智能化，二是智能化服務。之後，展開介紹關於智能物聯網的幾個核心技術領域，如新型機器學習範式、物聯網知識圖譜、異構協同計算架構等。最後，將分享關於網絡智能化、智能化服務方面的技術挑戰，以及智能物聯網核心技術的潛在應用場景。

### **About the Speaker**

Dr Wai Chen is currently Chief Scientist of China Mobile Research Institute, where he leads the research on Internet-of-Things (IoT) at China Mobile. The IoT research initiatives currently focus on machine intelligence, edge computing, C-V2X, smart senior-care, among others. Dr Chen has over 30 years of experiences in research and development of advanced technologies, including 20-plus years in Bellcore / Telcordia where he was a Chief Scientist and Director.

陳維，國家特聘專家，現任中國移動研究院首席科學家，擁有 30 多年前瞻技術研究經歷，包括 20 多年在美國貝爾通訊研究院（Bellcore/Telcordia）並擔任首席科學家和 Director 的工作經歷，主要研究領域為機器智能、邊緣計算、下一代車聯網及智能交通等。自 2012 年應邀來華，帶領研究團隊構建了包括機器智能、邊緣計算、下一代車聯網、智慧養老等物聯網智能化關鍵技術及應用體系，研發了一批"面向全國、惠及民生"的創新型規模化物聯網應用。

### **Ir John Chan**

**Director, Technical Services, CLP Power Hong Kong**

中華電力有限公司技術服務總監 陳君穎先生

### **About the Presentation**

Climate change has driven governments around the world to put forth various environmental sustainability initiatives, and decarbonisation through clean energy initiatives has thus become a global environment strategy amongst developed countries. The Paris Agreement, a legally binding international treaty on climate change that entered into force in November 2016, pledged to keep global temperature rise to 2 °C below pre-industrial level by the end of the century, and within 1.5°C by 2030. More than 130 countries, including the EU, China and the latest US administration, have committed to reach carbon neutrality, which means achieving a state of net-zero carbon emissions.

To achieve carbon neutrality, the development of new technologies for clean energy such as renewable energies (REs) and Smart Grid are essential, and the electrification of the transport sector can also significantly drive the decarbonisation progress. This presentation provides an overview on the latest progress on RE, Smart Grid and transport electrification development, and demonstrates how CLP Power (CLP) supports these initiatives. It will also introduce CLP's Climate Vision 2050, a commitment to play a role in bringing a clear blue sky to our community, paving the way forward to carbon neutrality.



### **About the Speaker**

Ir John Chan graduated from Queen's University, Canada, with a BSc(Hons) degree in Electrical Engineering (Computing Engineering Option), obtained his MBA from Chinese University of Hong Kong in 1999, and received his Master (MSc) degree in Electrical Engineering from Polytechnic University of Hong Kong in 2012. He started his career as a Graduate Engineer in the MTR Corporation Limited and was responsible for the tendering, design / project management and implementation of various telecommunications systems within the operating railway. Ir. Chan then progressed his career in CLP Power Hong Kong Limited, and has taken up posts in different engineering and business areas. He is currently the Director-Technical Services of CLP Power Hong Kong Limited, overseeing various technical functions including telecommunications, telemetry, metering, protection support, power quality, electric vehicle charging infrastructure, electrical services workshop, security and video analytics, etc. He is also the project champion for the Advanced Metering Infrastructure project.

Ir Chan has been serving as an active member in engineering learned societies since 2003. He has published technical papers in various publications and conferences, e.g. HKIE transaction, APSCOM, ICEE, HKIE iCiD conference, etc. He was the Chairman of the Electronics & Communications Section of IET Hong Kong in 2009-2010, and has been serving in the IET Hong Kong Branch Committee in 2016-2018. He is a career ambassador of HKIE since 2007 and is serving as a HKIE professional assessor since 2015. He is currently the Past Chairman of the HKIE Electronics Division, and has been serving in various committees, including OFCA Telecommunications Regulatory Affairs Committee, Radio Spectrum & Technical Standards Advisory Committee, Advisory Committee on Electronic Engineering for Chinese University of Hong Kong, etc.

### **Professor Wayne Luk**

**Faculty of Engineering, Department of Computing, Imperial College London, United Kingdom**

英國倫敦帝國學院

### **About the Presentation**

The range of machine Learning applications that demand high performance has been growing rapidly: from medical imaging to electronic trading. This talk describes recent trends in high performance machine learning systems based on domain-specific accelerators, and explores their development in the future. The presentation will include examples of accelerated machine learning systems selected from various application domains, such as experimental physics, epidemic simulation, and financial modelling. The opportunities and the challenges in designing and deploying next-generation accelerated machine learning systems will be addressed.

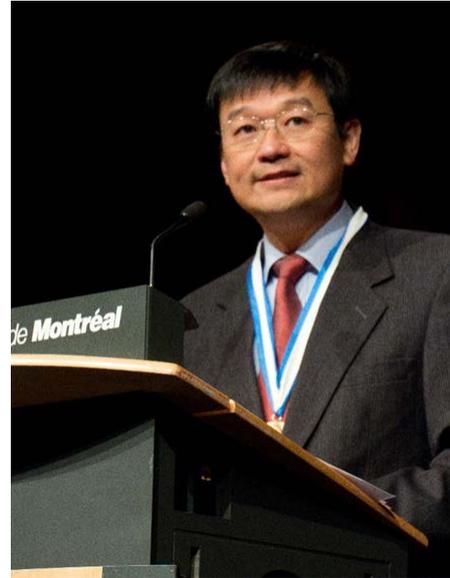
### **About the Speaker**

Wayne Luk is Professor of Computer Engineering at Imperial College London, and the Director of EPSRC Centre for Doctoral Training in High Performance Embedded and Distributed Systems. He founded and leads the Custom Computing Research Group in the Department of Computing at Imperial, and was Visiting Professor at Stanford University. His research interests include domain-specific acceleration, field-programmable technology, and design automation of machine learning systems. He is a Fellow of the IEEE, the BCS, and the Royal Academy of Engineering.



**Professor Ron Hui****School of Electrical and Electronic Engineering, Nanyang Technological University, Singapore**  
新加坡南洋理工大學**About the Presentation**

Wireless power was pioneered by Tesla a century ago, but it found no commercial applications in the early half of last century. However, it was revived in recent years and its market size is expected to increase from US\$ 6.5 Billion in 2018 to over US\$ 40 Billion by 2027. This talk will start with a brief historical review of “near-field” magnetic wireless power transfer (WPT) dating back from Nicolas Tesla’s work a century ago. It will clarify that magnetic resonance was pioneered by Tesla in his early work and is not a recent invention. It will also explain why WPT became feasible again since 1980s with some highlights of landmark examples. The second part of the talk will focus on the latest research and developments of WPT from one-directional to omni-directional applications, with emphases on portable electronics applications. The speaker will address some emerging WPT technologies and applications arising from the merge of the power system infrastructure and information infrastructure. The speaker will end his talk by addressing the emerging and future trends of WPT technologies and international WPT standards. He will also share his views on the factors that will limit WPT applications.

**About the Speaker**

Prof. Ron Hui obtained his Ph.D degree at Imperial College London in 1986. He has held academic positions at Nottingham University (1986-1989), UTS (1980-1990), Sydney University (1991-1996) and CityU of HK (1996-2010). In 2011-2021, he was a Chair Professor of Power Electronics at the University of Hong Kong and Imperial College London. At HKU, he held the Philip Wong Wilson Wong Professorship of Electrical Engineering. From March 2021, he holds the MediaTek Endowed Professorship at Nanyang Technological University and Chair Professorship at Imperial College London.

He has published over 300 refereed journal papers and has over 120 patents adopted by industry worldwide. His inventions have underpinned key dimensions of the world’s first wireless power standard Qi, launched in 2010 by the Wireless Power Consortium with over 400 company members including Apple, Samsung etc. He is the recipient of the 2015 IEEE William Newell Power Electronics Award, 2010 IEEE Rudolf Chope R&D Award and 2010 IET Crompton Medal. He is a Fellow of the IEEE (2003), Australian Academy of Technology & Engineering (2010), the US National Academy of Inventors (2018) and the Royal Academy of Engineering, UK (2016).

**Dr Stephen W. Cheung****Adjunct Professor of Physics, The University of Hong Kong /  
International Council Member, Orion Astropreneur Space Academy-Hong Kong  
香港大學物理系客座教授 / 創星滙(香港) 國際理事會成員 張華坤博士****About the Presentation**

This talk is an overview of New Space with focus on Low Earth Orbit (LEO).

Space is rapidly becoming a new pillar of the 21<sup>st</sup> century infrastructure with enormous economic implications. Presently, orbiting satellites serve downstream users by relaying enormous amounts of data globally while generating streams of information from observing the Earth. Our daily life would be tremendously disrupted if our data networks malfunctioned even for an hour.

Synonymous with Commercialization of Space, the New Space era began around two decades ago. Innovations have been driving down the cost of access to space. Space is no longer reserved for superpowers with big rockets. Lowering launch costs and miniaturized spacecraft, coupled with changing government policies, have accelerated the pace of commercialization and it has been happening most notably in the LEO. Dozens of countries large and small now have mini space programs training space technologists and sending small satellites to the LEO.

The summer of 2021 also witnessed the dawn of Space Tourism when two companies, Blue Origin and Virgin Galactic, flew private citizens to the edge of space and returned safely on vehicles that are designed for reusability. The price tag of touring space is expected to come down this decade as more passengers sign up for the experience.

China has a number of active space programs. Explorations include sending humans and instruments to the Moon and Mars. By the middle of this decade, the China Space Station will be in the LEO and Taikonauts will be shuttled regularly on scientific missions. LEO satellite constellations have also been planned as part of an expanding infrastructure.

Hong Kong is a major hub of data communications in the world and is well positioned to build on opportunities downstream of the rapidly developing space ecosystem.

**About the Speaker**

Dr Stephen W. Cheung is a frequent speaker at HKETA and other events. He is currently VP with a private group in the Silicon Valley, Adjunct Professor of Physics at the Hong Kong University and International Council member of the Orion Astropreneur Space Academy of Hong Kong.

Educated in the US, his career began as a research scientist at a NASA funded satellite program at Stanford University. He later joined Varian Medical Systems, a major supplier of radiation therapy systems—use of high energy X-rays to treat cancers. From 2007 to 2013, he was Director of Microwave Systems at Accuray Inc., a Silicon Valley company using robots to deliver precision radiation therapy. He was principal investigator of special projects funded by the government that earned Accuray a national award in 2013. He holds five US patents related to X-rays and is author of two books in microwave technology.

Dr Cheung worked in Hong Kong from mid-1990s to mid-2000s. He was general manager of the Electronics Division at the Hong Kong Productivity Council and later VP of a consumer electronics manufacturer.



**Dr Nim Cheung****Chairman, Symposium on Innovation & Technology Organising Committee****About the Moderator**

Dr Nim Kwan Cheung is Managing Director of Alphotronics Limited, an innovative start-up company in Hong Kong Science Park specialized in 3D photography, LIDAR, and artificial intelligence. He is also director of several listed and start-up companies in Hong Kong. Dr Cheung was Chief Executive Officer of the Hong Kong Applied Science and Technology Research Institute (ASTRI), a 600-member R&D organization in the information and communications area established by the Hong Kong SAR Government. He has founded and served as inaugural director of the National Engineering Research Centre for Application Specific Integrated Circuit Systems, the first National Engineering Centre established in Hong Kong.



Prior to joining ASTRI, Dr Cheung has held different research and senior management positions at AT&T Bell Labs, Bellcore, and Telcordia Technologies. He is a Telcordia Fellow and a Fellow of IEEE. Dr Cheung served as the 18th President of the IEEE Communications Society, a global professional organization with 45,000 members in 180 chapters around the world. He was Editor-in-Chief of the IEEE Communications Magazine, and was appointed Chairman of the IEEE Fellow Committee in 2012-13, where he presided over the selection of all new IEEE Fellows worldwide. He has also chaired and served in different Awards Boards in IEEE.

Dr Cheung received the University of Hong Kong Distinguished Alumni Award in 2010. He is an Honorary Professor of the Chinese University of Hong Kong and served as a Consulting Professor at Stanford University from 2004 to 2009. He was a Council Member of the Hong Kong Research Grants Council from 2009 to 2015. Dr Cheung obtained his B.Sc. degree from the University of Hong Kong, and M.S. and Ph.D. degrees from the California Institute of Technology.