



香港資優教育學苑
The Hong Kong Academy for Gifted Education
香港特別行政區政府教育局資助
Subvented by the Education Bureau, the Government of the HKSAR

香港青年科學院講座系列 (網上版)大綱

The Hong Kong Young Academy of Sciences (YASHK) talk series (Online Version)

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E2TEC909T

課程名稱 Programme Title	手性藥物與手性化妝品原料(網上版) (本課程內容與新興科技講座系列 — 科學、機遇及挑戰：手性藥物與手性化妝品原料 (E2TEC009T) 相同。)
資優課程簡介 Gifted Programme Introduction	世界充滿了手性。手性是分子中的基本對稱特性。手性已經被認為是藥物開發中最重要的考慮因素之一，因為手性分子只能在其中一種形式中有效，而另一種形式則不會顯示出任何正面的效果。手性分子對化妝品科學的影響尚未得到充分發展。我們將討論什麼是手性以及它如何影響藥物和護膚品。
講者 Speaker	講者汪君博士為香港浸會大學化學系副教授，她的研究興趣包括不對稱催化、合成方法、藥物化學和化妝品化學。最近她獲選為香港青年科學院院士。
課程種類/程度 Programme Type/level	網上學習課程 (程度 II) (非代幣課程)
適合對象 Target Participants	中一至中六的香港資優教育學苑學員。
講授語言 Medium of Instruction	普通話
預期學習成果 Intended Learning Outcomes	完成本資優課程後，資優生應能： 1. 解釋什麼是手性； 2. 解釋如何獲得手性分子； 3. 解釋手性如何影響藥物和護膚品
時數 Duration	2 小時
報名 Application	按此 報名。

E2TEC910T

課程名稱 Programme Title	都市太陽能邁向碳中和 (網上版) (本課程內容與新興科技講座系列 — 科學、機遇及挑戰：都市太陽能邁向碳中和 (E2TEC010T) 相同。)
資優課程簡介 Gifted Programme Introduction	香港政府制定了至 2050 年實現碳中和的宏偉目標，其總體規劃的關鍵策略是增加可再生太陽能的運用。在是次演講中，講者將討論我們如何依靠技術創新來應對這一巨大挑戰，並介紹一種嶄新的太陽能電池，其具備可印刷、柔性、透明和顏色可調的特性。這種新一代太陽能電池技術可結合用於建築物的窗戶、外牆或窗簾，在城市中產生更多的太陽能電力，解決城市通常只有有限 的土地和屋頂空間來安裝傳統的矽太陽能電池板的問題，促進香港太陽能發電的應用。
講者 Speaker	講者葉軒立教授為香港城市大學材料科學與工程學系及能源與環境學院教授，香港清潔能源研究院副院長。他的研究方向主要是 1) 有機太陽能電池，2) 鈣鈦礦太陽能電池，3) 鈣鈦礦發光二極管(LED) 三者的結構與性質之關係、元件物理與光物理學、界面和器件工藝等。
課程種類/程度 Programme Type/level	網上學習課程 (程度 II) (非代幣課程)
適合對象 Target Participants	中一至中六的香港資優教育學苑學員。
講授語言 Medium of Instruction	粵語
預期學習成果 Intended Learning Outcomes	完成本資優課程後，資優生應能： 1.明白可再生能源的背景及其主要驅動因素； 2.理解太陽能光伏電池的運作原理； 3.找出嶄新的光伏技術與建築物及其他社區設施的潛在整合方法； 4.應對香港太陽能發展的挑戰和機遇。
時數 Duration	2 小時
報名 Application	按此 報名。

E2TEC915T

課程名稱 Programme Title	Talk Series on Emerging Technologies — Science, Opportunities and Challenges 2023: Diamond as next-generation semiconductor (Online Version) (This programme was identical to Talk Series on Emerging Technologies — Science, Opportunities and Challenges: Diamond as next-generation semiconductor. (E2TEC015T))
資優課程簡介 Gifted Programme Introduction	Not only the hardest material in nature, diamond is also a promising semiconductor material with an ultrawide bandgap, ultrahigh carrier mobility and thermal conductivity. Unlike silicon, however, doping diamond has been always difficult which limits its microelectronics application. Our recent research shows that elastically stretching diamond can potentially address this grand challenge, and push its extreme figures-of-merit for future electronic device applications.
講者 Speaker	Prof. LU Yang is an HKU-100 Scholar Professor, Department of Mechanical Engineering, The University of Hong Kong. He a member of the Hong Kong Young Academy of Sciences (YASHK).
課程種類/程度 Programme Type/level	Online Learning Programme (Level II) (Non Token Required)
適合對象 Target Participants	S1 to S6 HKAGE student members
講授語言 Medium of Instruction	English
預期學習成果 Intended Learning Outcomes	Upon completion of the programme, participants should be able to: 1. understand the outstanding mechanical and electrical properties of nanoscale diamond; 2. know the current status and challenges for diamond being used into semiconductor industry; 3. obtain a preliminary idea of what “elastic strain engineering” is, and how it can make diamond an important semiconductor material in the future.
時數 Duration	2 hours
報名 Application	Click here for application.

E2TEC916T

課程名稱 Programme Title	Talk Series on Emerging Technologies - Science, Opportunities and Challenges 2023: Building and Innovating with DNA (Online Version) (This programme was identical to Talk Series on Emerging Technologies - Science, Opportunities and Challenges: Building and Innovating with DNA. (E2TEC016T))
資優課程簡介 Gifted Programme Introduction	Deoxyribonucleic acid (DNA) is commonly referred to as the blueprint of life because it contains the detail instructions required for an organism to survive, grow, develop, and reproduce. Besides this, more and more scientists have been harnessing the unique properties of DNA to build innovative systems and tools that propel science and technology forward, such as DNA data storage, aptamers, nanostructures, drug delivery, sensors, and etc. In this talk, we will present key concepts and examples from each category of system/tool and provide our views on the future directions in this exciting area of research.
講者 Speaker	Prof. Kwok Chun Kit is associate professor in the Department of Chemistry at the City University of Hong Kong. He is also the founder and organizer of Hong Kong RNA Club. In 2019, he was one of the recipients of the Croucher Innovation Award. In 2021, Dr. Kwok was recognized as elected member of Hong Kong Young Academy of Science (YASHK). Prof. Julian Tanner is Professor in the School of Biomedical Sciences within HKUMed at the University of Hong Kong. He also serves as Assistant Dean (Biomedical Sciences) within the T&L Deanery of the Faculty of Medicine, as Associate Director (T&L) of the School of Biomedical Sciences and is Director of the Bachelor of Biomedical Sciences degree programme. His research field is in medical sciences, with a particular focus on the directed evolution of nucleic acids for translational application in diagnostics and therapeutics.
課程種類/程度 Programme Type/level	Online Learning Programme (Level II) (Non Token Required)
適合對象 Target Participants	S1 to S6 HKAGE student members
講授語言 Medium of Instruction	English
預期學習成果 Intended Learning Outcomes	Upon completion of the programme, participants should be able to: 1. explain key concepts of Deoxyribonucleic acid, i.e., DNA; 2. illustrate examples from each DNA category of system and tool; 3. become familiar with the frontier of scientific research.
時數 Duration	2 hours
報名 Application	Click here for application.

E2TEC920T

課程名稱 Programme Title	Talk Series on Emerging Technologies - Science, Opportunities and Challenges 2025: Nanoscale 3D Printing that Realizes the Magics in Fairy Tales (Online Version) (This programme was identical to Talk Series on Emerging Technologies - Science, Opportunities and Challenges: Nanoscale 3D Printing that Realizes the Magics in Fairy Tales (E2TEC020T).)
資優課程簡介 Gifted Programme Introduction	Is the cloak of invisibility only a fairy tale? If not, how does it work and how do we make one via a nano 3-D printer? 3-D printing is one of the most important technological innovations in the past few decades. Among the various techniques, two-photon polymerization (TPP) is the most precise 3-D printing process (resolution ~ 140 nm) that has been used to create many complex structures for advanced photonic and nanoscale applications, e.g., microrobots, metamaterials, photonic crystals etc. However, to date the technology still remains a laboratory tool due to its high operation cost and limited fabrication rate. This seminar will introduce the recent development on the parallelization of the TPP process based on temporal focusing, where programmable femtosecond light sheets are used to substantially improve the rate without sacrificing resolution. By combining the fast nano 3-D printing solution with volume-shrinkable hydrogel scaffolds, we have demonstrated the fabrication of arbitrary 3-D objects and metamaterial structures of ~20 nm resolution with different materials (e.g., metals, metal oxides, semiconductors etc.) – a recently set world record. This means the nano 3-D printer can realize fairy tale magics, i.e., to fabricate a cloak of invisibility for visible light, and potentially play a large role in fields such as healthcare, clean energy and water, computing, and telecommunications.
講者 Speaker	The speaker, Professor CHEN Shih-Chi, is a Professor at the Department of Mechanical and Automation Engineering, The Chinese University of Hong Kong. He is a member of the American Society for Precision Engineering (ASPE), American Society of Mechanical Engineers (ASME), SPIE, and the Optical Society (OSA). His current research interests include ultrafast laser applications, biomedical optics, precision engineering, and nanomanufacturing.
課程種類/程度 Programme Type/level	Online Learning Programme (Level II) (Non Token Required)
適合對象 Target Participants	S1 to S6 HKAGE student members
講授語言 Medium of Instruction	English
預期學習成果 Intended Learning Outcomes	Upon completion of the programme, participants should be able to: 1. understand the basics of micro-additive manufacturing; 2. explain the process of two-photon absorption and two-photon polymerization; 3. describe the impact and new possibilities of printing nanometer-scale structures and objects.
時數 Duration	1 hour 30 minutes
報名 Application	Click here for application.

E2TEC921T

課程名稱 Programme Title	Talk Series on Emerging Technologies - Science, Opportunities and Challenges 2025: Emerging Infectious Diseases - Past, Present, and Future (Online Version) (This programme was identical to Talk Series on Emerging Technologies - Science, Opportunities and Challenges 2025: Emerging Infectious Diseases - Past, Present, and Future (E2TEC021T).)
資優課程簡介 Gifted Programme Introduction	Asia is a major hub for spread of emerging infectious diseases with significant public health and socioeconomic impact. The majority of emerging infectious diseases are caused by viruses that have crossed species barriers from animal reservoirs to humans. During an epidemic or pandemic, scientists and clinicians race against time to find out the modes of transmission, clinical manifestations, pathogenesis, diagnostics, therapeutics, vaccines, and non-pharmaceutical interventions of these emerging infectious diseases in order to minimize the damage they cause. In this talk, Professor Jasper Chan and Professor Shuofeng Yuan will use illustrative examples to demonstrate how we fight against emerging infectious diseases with particular relevance to Hong Kong.
講者 Speaker	The speakers, Professor Jasper Chan and Professor Shuofeng Yuan, are Professors at the Department of Microbiology, School of Clinical Medicine, The University of Hong Kong. Their research interests include druggable antiviral targets, diagnosis, treatment, and control of emerging infectious diseases with pandemic potential and/or special relevance in Asia.
課程種類/程度 Programme Type/level	Online Learning Programme (Level II) (Non Token Required)
適合對象 Target Participants	S1 to S6 HKAGE student members
講授語言 Medium of Instruction	English
預期學習成果 Intended Learning Outcomes	Upon completion of the programme, participants should be able to: 1. describe the history of emerging infectious diseases in Hong Kong; 2. explain the present countermeasures for emerging infectious diseases; 3. recognise new therapeutic approaches for the next pandemic.
時數 Duration	2 hours
報名 Application	Click here for application.

E2TEC922T

課程名稱 Programme Title	神奇的金納米粒子 (網上版) (本課程內容與新興科技講座系列 — 科學、機遇及挑戰 2025：神奇的金納米粒子 (E2TEC022T) 相同。)
資優課程簡介 Gifted Programme Introduction	「納米」(Nanometer，即 10^{-9} 米) 是一個長度單位，而「金納米粒子」是由金(化學符號：Au) 原子組成的納米粒子。金納米粒子具有特殊的光學、電子和化學特性；雖然金納米粒子被稱之為「金」，但在水溶液中呈紅色。古代人類已經發現金納米粒子具有紅色的色澤，並用於製造藝術品。本講座會為大家介紹金納米粒子在醫學檢測的應用，以及蔡教授的團隊最近如何利用它作為研究醫治疾病的新方法，有望改善人類健康。 金納米粒子在藥物傳遞方面亦具潛力。最近，蔡教授團隊發現金納米粒子在沒有裝載化學藥物或生物製劑的情況下，能夠靠自身的醫藥特性，於小鼠疾病模型中展示治療各類慢性疾病的能力，包括銀屑病的皮膚、動脈粥樣硬化的斑塊、纖維化的腎臟和退化的腦部有望為病人提供嶄新的療法。 「新興科技講座系列 — 科學、機遇及挑戰 2025：神奇的金納米粒子」由香港青年科學院及香港資優教育學苑合辦。
講者 Speaker	講者蔡宗衡博士為香港中文大學生物醫學工程學系教授。他的研究方向主要是 1) 納米醫學，2) 生物納米材料，3) 生物—納米交互作用。
課程種類/程度 Programme Type/level	網上學習課程 (程度 II) (非代幣課程)
適合對象 Target Participants	中一至中六的香港資優教育學苑學員。
講授語言 Medium of Instruction	粵語
預期學習成果 Intended Learning Outcomes	完成本資優課程後，資優生應能： 1. 理解生物納米技術的基本概念和應用； 2. 初步培養對科學文獻的認知； 3. 體會學科交叉型研究的影響力。
時數 Duration	2 小時
報名 Application	按此 報名。