FACULTY OF 理學院
SCIENCE

PolyU SCIENCE

Newsletter

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PolyU Science Creates Impact

THE HONG KONG POLYTECHNIC UNIVERSITY
香港理工大學

Opening Minds • Shaping the Future • 啟迪思維 • 成就未來

Contents

Editorial Board

We are delighted to present you the 2nd issue of the Faculty of Science Newsletter!

謹此為大家送上理學院的第2期學院通訊！

As we approach the second half of the year, with the lifting of mask mandate and social distancing measures in Hong Kong, we hope that your year has been filled with progress and inspiration.

With the increasing importance of food safety and nutrition, we are delighted to see the establishment of the Department of Food Science and Nutrition (FSN). Established in January 2023, FSN aims to fulfil the needs of a growing public awareness of food sustainability and safety which are based on the key pillars of Food Safety, Food Technology, Human Nutrition and Chinese Medicine. Through the collective efforts of our four constituent departments, the Faculty aims to provide holistic and high-quality education, cutting-edge research and knowledge transfer projects for the betterment of the whole society.

In line with our motto of 'PolyU Science Creates Impact', we are thrilled by the great news that our research effort and excellence have been recognised by the latest application results of the National Natural Science Foundation of China (NSFC) and the Research Grants Council (RGC) under the Joint Research Scheme (JRS) and Collaborative Research Scheme (CRS). Five of the research projects submitted by our scholars have received awards in the 2022/23 Exercise, with two proposals funded over HK$7 million in total under the CRS. This fund accounts for more than 20% of the total awarded funding among UGC-funded universities.

In addition, please join me in extending our congratulations to our Faculty's scholars on their exceptional achievements, as Prof. Zheng Zijian of the Department of Applied Biology and Chemical Technology (ABCT) and Prof. Yan Feng of the Department of Applied Physics (AP) have been promoted to Chair Professorship. We would also like to congratulate Dr Amber Chiou (FSN) and Dr Cesar Wong (ABCT) for receiving the President's Awards for Outstanding Achievement in Services 2022 for their effort made to the establishment of PolyU Molecular Diagnostic Laboratory (PU-MDL). The laboratory has been recognised by the HKSAR Government as having a significant role in contributing to the community for fighting against COVID-19 pandemic. We hereby offer our warmest congratulations to the aforementioned scholars and wish them all the best in scaling new heights in their future research endeavours!

Thank you for taking the time to read this newsletter. We will keep you updated on the latest development and achievements of our Faculty.

Prof. Wong Wai-yeung, Raymond
Dean, Faculty of Science
Clarea Au Professor in Energy
Chair Professor of Chemical Technology

較早前，香港已取消了口罩令以及社交距離措施，生活有序復常。踏入下半年，我們希望大家都能與日俱進、不斷創新。

隨著社會對食物安全和營養的意識日漸提升，我們很高興能為此創辦了食品科學及營養學系(FSN)。FSN於2023年1月創立，目標是以食品安全、食品科技、人類營養以及中醫藥為基礎，以迎合大眾對食物的可持續性及安全越來越重視的需求。憑藉四個學系的共同努力，理學院致力為學生提供全面及優質的教育，以及一系列創新研究與知識轉移項目，為整個社會作出貢獻。

在「理大科學　探理創新」的務實理念下，本院能夠得到國家自然科學基金委員會(NSFC)及研究資助局(RGC)的認可，在聯合科研資助基金(JRS)及合作研究重點項目計劃(CRS)的最新申請中取得理想成果，我們對於此卓越成績感到相當雀躍。在我們的學者提交的研究項目中，有五個項目於2022/23年度的計劃中脫穎而出，當中兩份建議書更獲CRS合共資助超過 700 萬港元，超過教資會資助大學總撥款金額的百分之二十。

與此同時，我們希望藉此機會向學院中取得非凡成就的幾位學者送上祝賀，當中應用生物及化學科技學系(ABCT)的鄭子劍教授及應用物理學系(AP)的嚴鋒教授，已獲晉升為講座教授。另外，我們亦恭喜邱家琪博士(FSN)及黃思銓博士(ABCT)憑著成立理大分子實驗室(PU-MDL)所作出的努力，而榮獲2022年校長特設傑出服務成就獎。在新冠疫情爆發期間，這個實驗室積極協助社區抗疫，因而獲得香港特區政府的表揚。我們在此向上述各位學者致以最真切的祝福，並希望他們能夠在未來的研究工作中，再度創出輝煌的成績！

感謝大家閱讀今期通訊。我們將會繼續為各位帶來有關理學院各項發展和成就的最新消息。

理學院院長
歐雪明能源教授及化學科技講座教授
黃維揚教授

Rational Design of Atomic Catalyst in Sustainable Energy Systems by Theoretical Calculations

運用理論計算為可持續能源系統提供先進原子催化劑的理性設計

Dr Huang Bolong
黃勃龍博士專訪
Associate Professor
Department of Applied Biology and Chemical Technology
應用生物及化學科技學系副教授

Dr Huang Bolong, Associate Professor of the Department of Applied Biology and Chemical Technology, focuses on the rational design of atomic catalysts by theoretical calculations which is making significant contributions to sustainable energy systems under carbon neutrality development. As global concerns for the energy crisis and climate change rise, finding solutions for sustainable energy systems has become a critical topic, which includes finding ways to control carbon footprints for carbon neutrality. Carbon dioxide reduction and fuel cell technologies have found to be promising but they rely on advanced and efficient catalysts. Among different catalysts, atomic catalysts have become the most promising candidates for sustainable energy systems due to their high performance and low cost.

Dr Huang's research pioneers the future for studying atomic catalysts with an effective theoretical method. By interpreting the atomic-level electronic structures and screening catalyst candidates based on electroactivity and stability, his work allows the development of high-performance atomic catalysts for sustainable energy systems.

Atomically dispersed metal atoms possess a unique electronic structure that makes them highly active as electrocatalysts in various reactions. However, stablizing these atoms and reducing their high surface energy requires appropriate support materials. Dr Huang's research examines the interactions between different metals and supporting materials, as well as facilitating the design of electrocatalysts for important carbon neutrality-related reactions such as oxygen reduction reaction, CO_2 reduction, water splitting and nitrogen reduction. His theoretical explorations help distinguish the best candidate for atomic catalysts, given the limitation of the existing electron microscope techniques and other characterisation methods. Dr Huang's theoretical calculations provide insight to achieve both high electroactivity and stability of atomic catalysts.

However, to screen optimal metal and support material combinations, efficient approaches are needed due to the vast number of options for atomic catalysts. Theoretical calculations can predict the performance, activity and stability of novel atomic catalysts in different electrochemical reactions, providing essential references to reduce the trial-and-error in experimental synthesis, as well as material costs, research time and information cost.

Rational theoretical guidance is crucial for designing novel atomic catalysts and carbon neutrality developments in Hong Kong and Mainland China. By combining theoretical calculations with empirically-derived data, Dr Huang's research offers novel solutions for a wide array of efficient catalysts, leading to a sustainable future.

應用生物及化學科技學系副教授黃勃龍博士透過理論計算為原子催化劑的理性設計提供了重要的理論研究，為碳中和發展新一代可持續能源系統帶來了莫大貢獻。隨著世界各地日漸關注能源危機及氣候變化，為能源系統尋找可持續的解決方案成為了討論議題。當中，各地都期望能將令環境問題惡化的碳足跡加以控制，以實現碳中和目標，而二氧化碳減排及燃料電池都是不可或缺的技術，兩者都需要採用先進有效的催化劑。由於原子催化劑高效且成本低，因此獲視為下一代可持續能源系統的中流砥柱。

由於黃博士從原子層面提出了一種有效解釋電子結構的理論，並根據電活性和穩定性來篩選各種催化劑，他的理論可視為相關領域的研究方向。原子級別分散的金屬原子具備獨特的電子結構，令它們在不同反應中表現出強勁的活性。然而，要減低高表面能並且帶來穩定性需要合適的襯底材料。黃博士的研究探索了不同金屬與襯底材料之間的相互作用，為相關化學反應設計出合適的電催化劑。這些反應包括氧還原、二氧化碳還原、水分解和氮還原反應等。受限於目前的技術，了解催化劑的原子級結構時仍面對不少困難，因此他的理論有助找出最佳的原子催化劑材料，為它們帶來高電活性和穩定性提供了重要資訊。

因為原子催化劑及金屬元素的組合繁多，因此需要更有效的方法以篩選出最佳組合。理論計算可讓我們了解其活性、穩定性，以及不同電化學反應表現，以提供數據及減少實驗試錯次數，同時減低材料成本和研究時間，及了解當中的反應過程與機制。因此，這種新型原子催化劑是香港及中國內地碳中和發展的重要研究方向。黃博士的研究結合了理論計算和實驗探索，為廣泛應用高效催化劑提供了新的契機，有助為未來建立一個可持續發展的社會。

Mathematical Theories of Gas Motion

氣體運動之數學理論

Prof. Yang Tong
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The study of the motion of fluids, such as liquids and gases, has a long history and has been facing challenges posed by irregular motion. Prof. Yang Tong, Chair Professor of Mathematical Science of the Department of Applied Mathematics said that the mathematical theories of gas motion can offer valuable insights into the fundamental phenomena and applications in various scientific and engineering disciplines, such as aerodynamics and hydrodynamics.

Instead of looking into the precise physical movement of each particle, kinetic theory provides an approach to investigate how the distribution function of particles evolves in time so that the macroscopic quantities, such as density, velocity, and temperature can be evaluated against physical observations.

Different mathematical theories can be applied to study the motion of different fluids, depending on the physical situation in which different parameters and scaling are taken into account. For example, macroscopic models like Euler and Navier-Stokes equations model water movement, while the Boltzmann equation models rarefied gas.

In addition to atmospheric pressure and airflow, external factors such as the Lorentz force induced by electromagnetic fields, and the force induced by boundary effects, are also considered when studying gas dynamics. While general attempts are made in mathematical theory, some conditions are often imposed to achieve well-posedness theory in a suitable function space.

Despite the breadth of the study of gas dynamics, numerous significant challenges remain, including Hilbert's sixth problem about Boltzmann equation, and the Millennium problem on Navier-Stokes equations. Probability is crucial to understanding gas dynamics as the Boltzmann equation is derived from statistical physics. While some exemplary works utilizing probability approaches to study gas dynamics exist, more research is necessary to achieve a complete understanding of these systems. Ultimately, developing mathematical models of gas motion necessitates a profound understanding of physical phenomena and rigorous mathematical analysis.

As Prof. Yang believes, one of the main objectives of investigating gas motion using mathematical theories is to inspire students and scholars to pursue research in theoretical mathematics, which can bring joy in problem-solving, and satisfaction in revealing the elegance of concepts and theories for practical applications. Additionally, developing a stable and promising academic career for young scholars in a stimulating and supportive environment is equally important.

包括液體和氣體在內的流體動力研究歷史悠久，卻一直面臨流體不規則運動的挑戰。應用數學系的數學科學講座教授楊彤教授認為，相關數學理論在解釋空氣動力學、流體動力學等各範疇的基本現象和應用時，能提供寶貴的參考價值。

有別於精確地研究每個粒子的物理運動規律，動理學理論提供了相關分布函數如何隨時間演變的方法，以對密度、速度和溫度等宏觀變量進行觀察和評估。不同的數學理論可以應用於研究各類型流體的運動，但當中的參數和測量準則，則取決於實際環境因素。例如，歐拉和納維爾 - 斯托克斯方程式等可以用來解釋水的運動規律；玻爾茨曼方程式則可以用來解釋稀薄氣體的運動規律。

另外，研究還需要考慮到外部因素，如電磁場引起的洛倫茲力、以及邊界效應引發的力。雖然一般都想將一套理論應用於所有情況，但建立時往往需要考慮一些相應條件，才能在合適的函數空間裡建立嚴格的理論。

氣體動力學的研究範圍十分廣泛，但仍存在大量挑戰，包括玻爾茨曼方程式的希爾伯特第六問題，以及納維爾-斯托克斯方程式的「千禧問題」。概率對於理解氣體動力學而言極其重要，因為玻爾茨曼方程式是從統計物理學中推導出來的。雖然現時已有利用概率研究氣體動力學的成功例子，不過還需要更深入的研究，才能掌握當中的理論。如果最終想建立新的數學模型，我們更需要對物理現象具備深刻的理解和進行嚴謹的數學分析。

楊教授認為，相關研究可激發學生和學者積極探討數學理論之美。當中不僅令人在解難的過程中感到快樂，還能揭示概念和理論在實際應用方面的巧妙，以帶來滿足感。為年輕學者提供具啟發性的研究環境和充份支援同樣重要，這讓他們的學術生涯能夠穩定發展及帶來前景。

Towards Next-generation Electronic Devices

迎接新一代的電子設備

Dr Zhao Jiong
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Awardee of the Faculty Award for Outstanding Achievement 2022 – Research and Scholarly Activities: Outstanding Young Researcher
2022年學院特設傑出成就獎 – 研究及學術活動（傑出青年研究員）得獎者

Ferroelectric thin films have garnered significant attention in various fields due to their exceptional properties, including their robust spontaneous electric polarization and strong coupling with optical, electric, and magnetic fields. These films are commonly used as memory storage units for information in electronic devices, and developing a stable ferroelectric thin film that can enhance electronic device performance is of utmost importance.

The research of Dr Zhao Jiong, Assistant Professor of the Department of Applied Physics, aims to develop a new phase-controllable two-dimensional ferroelectric thin film suitable for next-generation memory and computational devices. Using a chemical-based deposition method, his team synthesized a two-dimensional ferroelectric thin film in the beta phase and adjusted the indium ratio and other elements within the film in the beta prime phase. By doing this, they were able to create a ferroelectric thin film that exhibits ferroelectricity in the alpha phase, which is a significant breakthrough in material science. It allows a single material to display three different electric properties by controlling the three phases of ferroelectric thin films. This is the first time that a material has been able to exhibit three different electric properties and introduce ferroelectricity in a single film. This development is an important advancement in the field and can pave the way for the creation of new electronic devices with improved performance and functionality.

In addition, these ferroelectric thin films have the potential to revolutionize memory storage and computational devices due to their excellent electrical conductivity and long-term information retention capabilities. They are also a cost-effective and practical solution, as they are compatible with existing synthesis methods and can be integrated into various electronic devices.

With continued research and development, ferroelectric thin films could play a crucial role in addressing critical societal issues. The development of more electronic devices using these films and the aim of the new World-Class Transmission Electron Microscopy (TEM) facility installed in PolyU will aid in identifying key issues and solving critical problems related to materials science and broader societal issues such as carbon neutrality, energy crisis, post-Moore's law era electronics, and quantum technology.

由於鐵電薄膜具備非凡的特性，包括能穩固地進行自發性電極化，以及能與光場、電場和磁場形成強大的耦合，因此在多個使用範疇上都廣受關注。這些薄膜一般是用來製造電子設備中的資料記憶儲存器，因此研發穩定的鐵電薄膜藉以提高電子設備的性能，是目前一項相當重要的工作。

應用物理學系助理教授趙炯博士的研究目標，是研發適合新一代用於儲存及計算設備的新型相控二維鐵電薄膜。透過採用以化學方式進行的沉積法，他的研究團隊在beta-In_2Se_3中成功合成了一片二維的鐵電薄膜，以及在beta相中調整了薄膜內銦的比例和其他元素。在這個做法下，他們製造了一片能在alpha-In_2Se_3中展現出鐵電性的鐵電薄膜，在材料科學上可謂一大突破。這片薄膜能透過控制鐵電薄膜的三個相，令同一物料能具備三種不同的電學特性。這是首次令一種物料能呈現出三種不同的電學特質，以及將鐵電性引進到單一的薄膜中。這項研發成果不僅令相關的科學領域向前邁進了一大步，同時亦能為製造具備更高性能和功能的嶄新電子設備打好基礎。

此外，由於這些鐵電薄膜具有優秀的導電性能和長期保存資料的能力，因此或能為記憶儲存器和計算設備的未來發展帶來重大改變。與此同時，由於這些薄膜能兼容目前的合成方法，並且可以整合到各種電子設備中，因此是一種實用且符合成本效益的解決方案。

隨著研發工作繼續進行，鐵電薄膜有望協助我們有效解決各項重要的社會議題。透過這些薄膜來研發更多電子設備，以及運用理大達世界水平的全新穿透式電子顯微鏡(TEM)設備，將有助掌握及解決與材料科學以至其他社會議題相關的關鍵難題，當中包括碳中和、能源危機、後摩爾定律時代，以及量子技術。

Discovery and Application of Medicinal Fungus Cs-HK1 and Bioactive Polysaccharides

藥用真菌Cs-HK1及生物活性多醣體的發現及應用

Prof. Wu Jian-yong
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食品科學及營養學系研究教授

The Cordyceps fungus or Chinese caterpillar fungus has been recognised for its medicinal properties for centuries. Currently, Prof. Wu Jian-yong, Research Professor of the Department of Food Science and Nutrition, and his team are conducting research on the medicinal functions of Cs-HK1, a species of Cordyceps fungus. The focus of their investigation is on the fungal mycelium and polysaccharides of Cs-HK1, as well as the relationship between the structure and functions of these molecules.

Natural Cordyceps found in the Himalayan region take 8-10 months to develop in harsh environments and its artificial cultivation is extremely complicated and labour-intensive. Since natural Cordyceps is very rare and expensive, mycelial fermentation of Cordyceps fungi has become a major supply of the raw materials for Cordyceps healthcare products.

The Cs-HK1 mycelial fermentation has been found to offer very cost-effective cultivation under controlled production environments, and, importantly, its primary constituents are similar to those found in natural species. While these findings are limited to certain known ingredients, some of Cs-HK1's functions have even demonstrated greater efficacy in responding to diseases. Tests on animals have shown that the mycelium in Cs-HK1 has medicinal effects in treating tumours and anti-fatigue effects during exhaustive exercise, even stronger than the natural Cordyceps, while its polysaccharides have demonstrated stronger anti-inflammatory effects than those found in other medicinal fungi and plants. As a result, Cs-HK1 is the most promising alternative to natural Cordyceps in terms of its cost-effective cultivation, medicinal value, and commercial potential. Prof. Wu and his team intend to investigate the relationship between the structure and functions of the polysaccharides produced by Cs-HK1 further.

Given these possibilities, Prof. Wu has developed a roadmap for Cs-HK1 and hopes to incorporate the benefits found in its mycelium and polysaccharides into health foods, dietary supplements, and immune function boosters in the near future. He aims to develop commercial products that can protect and promote human health, and treat metabolic disorders. In the long run, he hopes to develop agents or molecules to treat specific diseases, although drug production is a lengthy process.

幾個世紀以來，
冬蟲夏草最為人熟
識的就是其藥用價值。
食品科學及營養學系研究教
授吳建勇教授和他的團隊目前正針
對蟲草屬真菌Cs-HK1的藥用功效進行研
究，當中的研究重點是Cs-HK1的真菌菌絲體和
多醣體，以及這些分子在結構與功效之間的關係。

天然的冬蟲夏草生長於喜馬拉雅地區，並且需要8至10個月才能在當地嚴峻的環境中生長；至於人工培植蟲草則是一項相當複雜的程序，而且需涉及大量人手。由於天然的冬蟲夏草非常罕有，而且價格高昂，因此蟲草菌的菌絲體發酵已成為冬蟲夏草保健產品的主要原材料。

研究發現在人為控制的生產環境下，Cs-HK1菌絲體發酵能大幅提升培植程序的成本效益；更重要的是，當中的主要成份與天然生長的品種相似。雖然這些發現只局限於某些已知成份，但是Cs-HK1所具備的某些功用，在治療疾病方面甚至比天然生長的蟲草有更強的功效。在動物身上進行的實驗顯示，Cs-HK1中的菌絲體具有治療腫瘤的藥用效能，以及在劇烈運動後提供抗疲勞的作用，效果比天然蟲草更強；而相比其他藥用真菌和植物中的多醣體，Cs-HK1的多醣體具有更強的抗炎功效。因此，從培植的成本效益、藥用價值以及商業潛力方面來看，Cs-HK1最有望成為天然冬蟲夏草的替代產品。正因如此，吳教授和團隊打算針對Cs-HK1所產生的多醣體，進一步研究其結構和功效之間的關係。

因應這些可能性，吳教授為Cs-HK1制訂了一個研究方案，期望在不久將來能夠將於Cs-HK1菌絲體和多醣體中所發現的功效引進到保健產品、膳食補充劑以及免疫功能加強劑中。他的目標是研發一些能保障和促進人體健康、治療代謝失調的商業產品。雖然藥物生產是一個漫長的程序，但長遠而言吳教授希望能研發出對特定疾病具治療功效的藥劑或成份因子。

Establishment of the Department of Food Science and Nutrition

隆重宣佈食品科學及營養學系成立

We are excited to announce the establishment of the **Department of Food Science and Nutrition (FSN)** as a constituent academic department under the Faculty of Science with effect from 1st January 2023. Having the vision of becoming a global leader in advancing the Food Science and Nutrition industry, FSN is committed to creating positive societal impacts, training professional talents, conducting innovative research, and facilitating knowledge transfer for the betterment of public health and the well-being of mankind.

The rising concerns about environmental change, food security and human health have provided the food industry with a new direction. Drawing on over a decade of research in the disciplines of Food Safety and Technology, as well as Chinese Medicine, FSN is uniquely positioned to embrace the nature of interdisciplinary in research innovation, and has a focus on five research directions, which are I) Food Safety and Bacterial Antimicrobial Resistance under One Health Framework; II) Microbiome in Nutrition and Human Health; III) Food Sustainability; IV) Functional Foods and Chinese Medicine; and V) Nutrition and Human Health: The Emergence of Precision Nutrition.

In addition to conducting cutting-edge research, FSN works hand-in-hand with the recently established Research Institute for Future Food (RiFood) and Research Centre for Chinese Medicine Innovation (RCMI) to provide interdisciplinary solutions for major social challenges through advanced research and knowledge transfer. The goal of FSN is to create positive societal impact through partnerships and interactions with academia, industry and government, with a particular focus on the Greater Bay Area.

To cultivate graduates to meet the needs of the ever-changing world and contribute to society, FSN offers academic programmes that are tailored to the pace of social change. The Department actively organizes exchange programmes with renowned overseas institutions (such as the National University of Singapore, the University of Technology Sydney and other universities in the United Kingdom, Germany, the United States, Mainland China, etc) and field visits to equip our students with international perspectives. In addition, FSN's Work-Integrated Education programme also provides on-the-job training to our students as well as consultancy to offer technical solutions to the industry.

As the first academic department in Food Science and Nutrition in Hong Kong, the Faculty would like to extend our heartfelt congratulations on the establishment of FSN and pledge our support for its effort to succeed in the future.

Academic programmes offered by FSN in 2023/24:
- BSc (Hons) in Food Safety and Technology
- MSc in Global Food Safety Management and Risk Analysis
- MSc in Nutrition and Healthy Ageing

我們欣然宣佈**食品科學及營養學系(FSN)**已於2023年1月1日正式成立，成為理學院轄下其中一個學系。這學系旨在推動食品科學及營養行業的發展，並且致力為社會帶來正面的影響、培育專業人才、帶領創新研究以及促進知識轉移，從而改善公共衛生和為人類謀福祉。

隨著環境變遷，食品安全以及公眾健康日漸受到社會各界的關注，食品行業亦出現了新的發展方向。憑著十多年來在食品安全和技術以及中醫學方面的研究背景，食品科學及營養學系具備獨有的優勢以進行跨學科的研究和創新工作，並且以五個範疇為主要研究方向，分別是1)在"健康一體"的概念下，研究食品安全和細菌對抗菌劑的耐藥性；2)微生物群組在營養和人類健康方面所擔當的角色；3)食物的可持續性；4)功能性食品與中藥；及5)營養和人類健康：精準營養的興起。

除了從事嶄新的研究工作外，這學系亦與最近成立的未來食品研究院(RiFood)及中醫藥創新研究中心(RCMI)攜手合作，以透過先進的研究和知識轉移，為社會面對的各種重大挑戰提供跨學科的解決方案。學系致力與學術界、業界及政府合作和溝通，從而為社會(特別是大灣區)帶來正面的影響。

為了培育優秀的畢業生，以滿足世界日新月異的需求以及為社會作出貢獻，食品科學及營養學系為學生提供多個應因社會發展步伐而設計的學術課程。學系積極與海外各大知名院校(例如新加坡國立大學、悉尼科技大學，以及其他位於英國、德國、美國、及中國內地等大學)舉辦交流和實地考察活動，以拓展學生的國際視野。此外，這學系的課程亦注重行業實踐，除了為學生提供在職培訓外，亦為業界在技術解決方案方面提供諮詢服務。

作為全港首個食品科學及營養學系，學院對這學系的成立致以衷心的祝賀，並且承諾將會全力提供支援，以協助學系在未來取得輝煌的成績。

學系在2023/24年提供的本科及碩士課程:
- 食品科技與食物安全(榮譽)理學士學位
- 環球食品安全管理及風險分析理學碩士學位
- 營養與健康活齡理學碩士學位

HKUST x PolyU Counsellor Fly-in Programme
升學輔導主任訪港交流團

The HKUST x PolyU Counsellor Fly-in Programme was successfully held from 29 to 31 March. Coordinated by the Global Engagement Office of PolyU, we are glad to have invited over 50 counsellors from 15 different countries, regions, and local international schools to visit our campus. On March 30, we held a mini-fair where international students shared their fruitful study experiences with the counsellors, and our academic colleagues briefed them on the uniqueness of our programme curriculum. A lab tour was also held on the following day, where counsellors visited our teaching and learning facilities to gain insight into the world-class equipment and resources available to our students.

升學輔導主任訪港交流團於3月29至31日順利舉行。在理大環球事務處的統籌下，理學院欣然接待了50多位來自15個不同國家及地區，以及本地的中學代表參觀理大校園。交流團於3月30日出席了小型交流會，並與學院的導師和國際學生了解留學生於理大的生活及課程特色。翌日，交流團參觀了學院的教學設施，讓大家更深入了解學院為學生提供的先進設備和資源。

PolyU Taster Programme 2023
理大體驗日2023

The PolyU Taster Programme 2023 was held on PolyU campus from 3 to 29 April. The programme provided secondary students an exciting opportunity to experience the study life at PolyU. Over the past 2 weeks, more than 100 F.4 and F.5 students attended the fun-filled activities hosted by our four departments. They participated in mini-lectures, guided tours, hands-on workshops and student sharing sessions to discover their interests and explore the study options available at PolyU.

理大體驗日於4月3日至29日在理大校園成功舉行。活動能讓中學生體驗在理大學習的精彩課程內容，並一嘗大學生活。超過100名中四及中五學生參加了由學院轄下四個學系所舉辦的一連串體驗活動，當中包括小型講座、實驗室導賞團、互動工作坊和學生分享會，藉以讓同學們發掘興趣與潛能，探索適合自己的科目。

"Superpowers of an Ordinary Person"

Prof. Raymond Wong featured on RTHK TV programme "Our Scientists"

港台紀錄片《我們的科學家》訪問黃維揚教授：平凡人的超能力

On 21 January, Prof. Raymond Wong, Dean of Faculty of Science, was featured on the 5th episode of the RTHK TV programme "Our Scientists" to share his aspirations, research ideas and achievements. In the programme, he reminisced about his youth and childhood, and how HKU, his secondary schools and the place he lived before, helped foster the distinguished scientist he has become today. The programme also featured interviews with Prof. Teng Jin-guang, President of PolyU, Prof. Wong Wing-tak, Deputy President and Provost of PolyU, and Prof. Rick Wong, Interim Provost of HKBU, to show their lifelong friendships.

The eight-episode documentary "Our Scientists" brings audience to the exciting world of science by interviewing a number of outstanding scientists, and to understand their intellectual and continuous pursuit of scientific exploration and knowledge.

香港電台節目《我們的科學家》於1月21日邀請了理學院院長黃維揚教授成為第五集的主題人物，讓觀眾了解其科研理念及成果，並走訪他就讀的香港大學、中學及兒時住處，了解這些地方如何將其孕育成非凡的科學家。節目亦輯錄了理大校長滕錦光教授的訪問、以及常務及學務副校長黃永德教授及香港浸會大學暫任常務副校長黃偉國教授的對談，藉以懷緬往事，相知相遇。

一連八集的紀錄片《我們的科學家》帶領觀眾走進科學世界，了解科學家們在求知路上不斷追求、勇於探索的精神。
Revisit the episode 重溫節目內容: https://www.rthk.hk/tv/dtt31/programme/ourscientists2022/episode/857745

PolyU Scholar Using Data Science to Resolve the Enigma of Amazonian Cities

理大學者利用數據科學解開亞馬遜城市新冠疫情之謎

Dr He Daihai of the Department of Applied Mathematics has recently published a research paper in one of the world's most-cited and comprehensive multidisciplinary scientific journals, the *Proceedings of the National Academy of Sciences (PNAS)*. The article titled "Resolving the enigma of Iquitos and Manaus: A modelling analysis of multiple COVID-19 epidemic waves in two Amazonian cities".

應用數學系何岱海博士最近於全球被引用次數最多的綜合性多學科學術期刊之一的《美國國家科學院院刊》(PNAS)上，發表了一篇有關新冠病毒的研究報告。報告標題為「解開伊基托斯和馬瑙斯之謎：針對亞馬遜兩個城市多輪新冠疫情的建模分析」。

Establishment of Research Centres 新成立研究中心

Research Centre for Carbon-Strategic Catalysis

碳戰略催化研究中心

Centre Director: **Dr Huang Bolong**, *Department of Applied Biology and Chemical Technology*

Established in June 2022, the Centre aims to offer a comprehensive platform to achieve more impactful outputs on the advanced catalyst design and synthesis for sustainable energy development strategies, and to provide significant contribution to achieving carbon neutrality in the long run.

中心主任: 應用生物及化學科技學系**黃勃龍博士**

成立於2022年6月，碳戰略催化研究中心旨在提供一個平台，於可持續能源發展方面帶來更先進及具影響力的研究成果，並致力為實現碳中和作出重大貢獻。

Research Centre for Quantitative Finance

量化金融研究中心

Centre Director: **Prof. Dai Min**, *Department of Applied Mathematics*

The Centre aims to foster research, education, and academia-industry collaborations in the field of quantitative finance, by bringing together experts from relevant fields including finance, mathematics, statistics, and data science at PolyU.

中心主任: 應用數學系**戴民講座教授**

本中心旨在匯聚理大於金融、數學、統計學、數據科學等領域的專家，以促進量化金融領域相關的研究、教育及學界商業合作。

Faculty of Science Distinguished Lectures 理學院傑出學者講座

The Faculty launched a series of Distinguished Lectures in March 2023, gathering internationally renowned scholars to promote academic exchange and explore research collaboration opportunities at PolyU.

學院於 2023 年 3 月舉辦了一系列傑出學者講座，匯聚國際知名學者以促進院校之間的學術交流，並探索研究合作機會。

Distinguished Lecture on "2D-material-based Active-Matrix Backplane for Large Area Electronics"

Date: 9 March 2023
Speaker: Prof. Ahn Jong-hyun
Department of Electrical and Electronic Engineering
Yonsei University

Distinguished Lecture on "Thousands of Conductance Levels in Memristors Monolithically Integrated on CMOS"

Date: 10 March 2023
Speaker: Prof. J. Joshua Yang
Department of Electrical and Computer Engineering
University of Southern California

Major External Research Grant 獲外界資助項目

In 2022/2023, academics and researchers of our Faculty have secured HKD115 million funding from different competitive grant schemes and collaborative funds for their research projects. Below are the major external grants obtained:

理學院的學者及研究人員的科研項目於2022/2023共獲得1.15億港元外界科研資金支持，以下為部分主要項目：

Funding source	Principal Investigator/ Project Coordinator	Funding Amount (HKD)
CAS-Croucher Funding Scheme for Joint Laboratories	Prof. Chen Xiaojun, AMA	$3,000,000
Fisheries Enhancement Fund	Dr Kwok Wing-hin, Kevin, FSN	$1,553,250
ITF-Mainland-Hong Kong Joint Funding Scheme (MHKJFS)	Dr Xu Linli, ABCT	$2,206,520
NSFC/RGC Collaborative Research Scheme	Prof. Zheng Zijian, ABCT	$3,592,800
NSFC/RGC Collaborative Research Scheme	Prof. Chai Yang, AP	$3,571,200
RGC Collaborative Research Fund (CRF)	Prof. Wong Wai-yeung, Raymond, ABCT	$7,964,914
RGC Collaborative Research Fund (CRF)	Prof. Chen Xiaojun, AMA	$3,099,659
RGC Research Impact Fund (RIF)	Prof Lee Kin-wah, Terence, ABCT	$4,150,000
RGC Research Impact Fund (RIF)	Prof Zheng Zijian, ABCT	$5,550,000
RGC Senior Research Fellow Scheme (SRFS)	Prof Sun Defeng, AMA	$7,798,380
MOST國家科技部政府間科技合作專案	Prof. Wong Wai-yeung, Raymond, ABCT	$3,439,200
深圳市基础研究(重点项目)	Dr Lee Yoon Suk, ABCT	$2,292,800

Old School, New School, at PolyU

溫故至盡、知新以極，探幽窮賾在理工

"To look back in time, to see how human civilization first became interested in mathematics and other science disciplines.

用傳統方法回顧歷史，細看縱橫交錯的人類文明起源是如何與數學和一些科學學科交織而成。"

Dr Lee Heung-wing, Joseph
李向榮博士
Associate Professor
Department of Applied Mathematics
應用數學系副教授
Awardee of the Faculty Award for Outstanding Achievement 2022 – Teaching Team Award
2022年學院特設傑出成就獎 – 教學（團隊獎項）得獎者

Teaching at PolyU has always been challenging. For some reasons, the subjects our undergraduate students are taking aren't necessarily their first choice. It could be part of a package bundled with their bachelor's degree programme. For example, students majoring in one science discipline are required to take mandatory mathematics courses. Although learning mathematics and statistics skills are important for their research and academic development, some may not find it as enjoyable or engaging as their preferred subjects. While some students might be enthusiastic, they may feel "haunted" by a few predominating factors that have yet to be resolved. For example:

1. *There is a lack of the traditional mathematics ambiance in secondary school (as evidenced by the decreasing percentages of students taking M1 or M2, and the syllabus of HKDSE Maths/ M1/M2 has been reduced compared to that of the previous curriculums like HKCEE Maths and A-Maths, as well as HKAL Pure-Math). While it may be possible to teach students at the tertiary level, the mentality of refusing to understand deeper mathematics or lacking the perseverance to learn harder concepts has been harmful.*
2. *We also have to face the problem that students are indoctrinated with the habit of exam-oriented drilling of maths exercises, which can hinder their ability to appreciate the beauty of mathematics at their younger age. Despite getting high exam score, many lack the interest in exploring the significance of mathematics, and its rich cultural achievements throughout human history.*

To tackle this phenomenon, lecturers are trying very hard to make their lectures and tutorials more interesting within the limits of the syllabus. Some adopt modern gadgets with trendy high-tech tools to teach, while some attempt to build an approachable and friendly relationship with students to let them have a positive image towards maths.

Received a postcard from a graduate who went on to pursue further studies.
收到一名繼續深造的學生寄來的明信片。

As we are all aware, undergraduate curriculum particularly focuses on teaching basic and fundamental concepts and skills, and more advanced research only when getting into research school. To inspire student interest in these subjects at the undergraduate level, lecturers usually recall their first passion that sparkled for the subjects years ago, in an attempt to reignite the passion of students by sharing their personal experience.

Nevertheless, I have a bolder suggestion. On the one hand, with the old school approach, to look back in time, to see how human civilization first became interested in mathematics and other science disciplines, as history gives us a better understanding of the logic behind some practices and the reason they change over time. And knowing all the history gives students a strong foothold to move forward. If STEM is an arrow pointing towards a target future, then knowing where the arrow starts and how history forms its natural direction is far more important than just focusing on the advanced achievements at the target end.

On the other hand, with the new school approach, I strongly encourage the incorporation of cloud computing mathematics software in teaching, such as using of CoCalc, as they can reduce the amount of monotonous work involved in mathematics teaching, and free up more time for students to confirm their graph sketching and the partial fraction expansions, or practise mathematical thinking, with just a click.

在大學任教所面對的挑戰素來不少。基於某些原因，選擇修讀我們學科的學生未必視其為他們的首選科目，因為我們都只不過是他們的學位課程裡的其中一個必修科，就好像主修科學學科的學生需要強制修讀數學課程一樣。雖然大家都知道數學和統計技能對學生的研究和學術發展十分重要，但始終有部份學生未必會像他們喜愛主修科目般對此如痴如醉。當然，有部份學生對數學充滿熱誠，但始終有些因素，令部分學生對我們的科目未能產生很大的興趣。例如：

1. *由中學時期已經欠缺學習數學應有的傳統風氣(可見於選修M1或M2的學生比例下降，而HKDSE數學/M1/M2的課程相比以往HKCEE數學、附加數學，以及高考純數科的課程亦有所縮減)。雖然在高等學院可以彌補當中部份所失，但學生不再熱衷於理解更深奧的數學或學習更深入的概念，這種風氣顯然難以挽救其中。*
2. *我們不得不承認，我們的學生已經被灌輸為應付考試而不停操練數學題的觀念，而這種風氣的確會令他們從小開始就對學習數學失去耐性。雖然操練或可達至不錯的考試成績，但很多學生已經對探索數學的意義以及了解數學對整個人類文化發展的貢獻失去了興趣。*

有見及此，不少講師都非常努力想辦法令他們的課堂和教學變得有趣。有些講師會利用吸引眼球的高科技玩意來進行教學，有些則嘗試與學生建立平易近人的友好關係，希望學生可以對數學科產生正面的印象。

眾所周知，大學本科的課程只會著重教授基本和基礎概念與技能，只有成為研究生之後才有機會接觸到更高階的研究。為了在大學時期就能激發學生的興趣，講師通常會試圖勾起學生選讀這些學科的初衷，並嘗試透過分享個人經驗來重新燃點學生的熱情。

不過，我的做法則更加大膽。就是一方面用傳統方法回顧歷史，細看縱橫交錯的人類文明起源是如何與數學和一些科學學科交織而成，因為歷史可以讓我們更清楚地理解一些做法背後的邏輯，以及它們為何會發展至此。了解所有歷史淵源可以幫助學生鞏固基礎，往後才能學有所成。如果STEM是通往羅馬的一條大路，那麼知道大路的起點以及歷史如何自然地成為引領大路的明燈，遠比只著重功過成就重要得多。

另一方面，我亦會嘗試新的教學方式，在教學當中引入一些例如CoCalc的雲端數學計算軟件，因為這些軟件可以減少教學過程中出現大量單調沉悶的公式，只需按一下鍵就能製作大大小小不同圖形，變相能騰出時間讓學生訓練更有趣味的數學思維，或了解更多代數部分分式的理論。

Taking students on a field trip to the TST Clock Tower and using techniques from the Ancient Text "The Sea Island Mathematical Manual" to estimate its height.
帶領學生實地考察尖沙咀鐘樓，並借用古籍《海島算經》裡的算術技巧來推算鐘樓的高度。

Soft Materials and Devices for Wearable, Skin-attached, and Implantable Electronics

應用於穿戴式裝置、吸附於皮膚表面和植入式電子產品的柔軟物料

Our research team is currently focusing on developing functional materials for soft electronics, with a particular interest in exploring their potential applications in areas such as health, sports, biomedicine, and lifestyles. Our approach differs from conventional electronics in that we are focusing on creating soft, flexible materials that take the form of fibres, textiles, and stretchable rubbers. These materials are then engineered into wearable fabric-like devices that can be worn, or skin-like patches that can be applied directly to the skin or even implanted inside the body.

To achieve these goals, we have been working intensively on the following areas:

我們的研究團隊一直致力開發具功能性的柔軟物料，並希望將其應用於表面柔軟的電子裝置之上，我們尤其希望將這種技術應用於健康、運動、生物醫學方面以改善生活。我們的研究方向與研發一般傳統電子產品不同，我們一直集中研究如何採用纖維、紡織布料及可拉伸橡膠等物質，來研發出具柔軟性及靈活度的物料，再將其改良成為與紡織布料質感相似的可穿戴裝置，或可以直接應用於皮膚上甚至植入體內的皮膚貼片。

為達至以上目標，我們的研究工作一直集中於以下範疇：

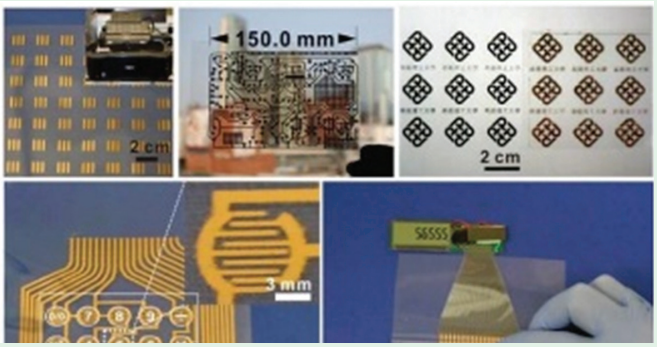
Prof. Zheng Zijian
鄭子劍教授
Chair Professor of Soft Materials and Devices
Department of Applied Biology and Chemical Technology
應用生物及化學科技學系軟材料及器件講座教授

Flexible and stretchable electronic materials

具柔軟性和可拉伸的電子物料

Conventional electronic materials, including metals, semiconductors, and insulators, have been found to exhibit inherent brittleness, rendering them susceptible to cracking and fracturing upon bending or stretching. To address this limitation, we have been developing flexible and even stretchable electronic materials with the use of techniques such as chemical synthesis, surface modification, and compositing. These materials can then be coated onto fibres, textiles, thin films, and rubbers with high durability and performance.

一些傳統電子物料，包括金屬、半導體和絕緣體等，皆具有脆弱性的特質，令它們在彎曲或拉伸時容易裂開或斷裂。為了解決這方面的不足，我們的研究著墨於透過使用化學合成、改造表質及將多個物料合成等技術，來開發具柔軟性和可拉伸的電子物料。然後再將這些物料塗覆到纖維、紡織品、薄膜以及橡膠上，以帶來高耐用性和卓越性能。

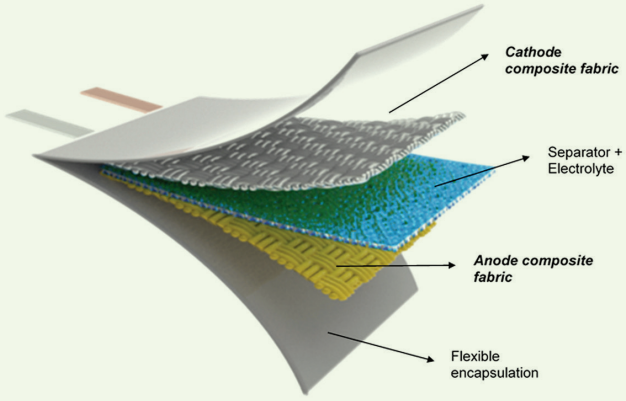


Printed metallic electrodes for soft electronics
貼印於柔軟電子貼片上的金屬電極物料

Flexible batteries
柔軟電池

Most electronic devices necessitate reliable battery to power. However, conventional batteries, which are rigid in nature, are difficult to be integrated with flexible electronic devices. To address this issue, we have focused on developing highly flexible rechargeable batteries, including flexible lithium-ion batteries, Zn batteries, and future high-energy-density lithium metal batteries, and synthesizing new battery component materials such as current collectors, electrodes, separators, and electrolytes, and engineer the battery structure. As a result, the flexible batteries can be bent or even folded without losing its performance. Moreover, these batteries can be charged and discharged a few hundred times, comparable to commonly used lithium-ion batteries in mobile phones.

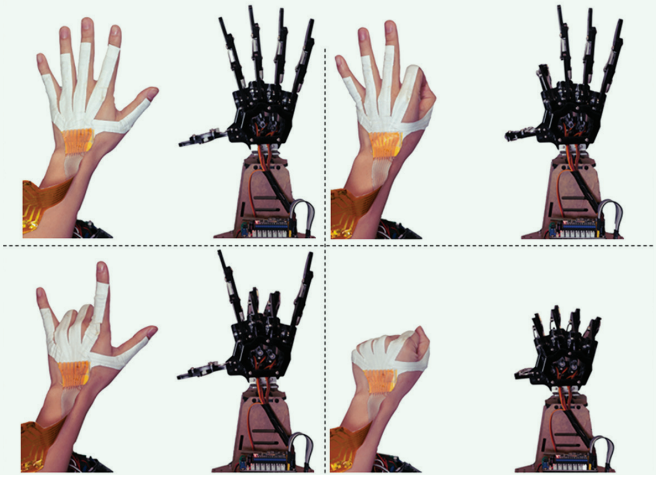
大部份電子設備都需要可靠的供電來運作。然而，傳統電池本身極為堅硬，難以應用於柔軟的電子裝置之上。有見及此，我們致力開發具極高柔軟度的可充電電池，包括柔性鋰離子電池、鋅電池和具潛力的高能量密度鋰金屬電池，並改良了電池的結構，當中加入了電流收集器、電極、隔膜和電解液等應用於新型電池的零件，讓這些電池能夠彎曲甚至折疊而不會失去其性能。另外，這些電池更可以充電及使用數百次，耐用性堪比手機常用的鋰離子電池。



Biocompatible, permeable soft electronic devices
具柔軟性和可拉伸的電子物料

Biocompatibility and permeability play a pivotal role in wearable and bioelectronics. In addition to ensuring the devices are soft and functional, it is important to develop biosafe and comfortable devices that can be worn for extended period. Hence, we have developed stretchable electronics with permeable properties by fabricating devices on porous and fibrous structures. These devices exhibit high level of flexibility and stretchability. Moreover, the utilization of permeable structures enhances the devices' wearability and long-term biocompatibility, which is essential for skin-attached and implantable bioelectronics.

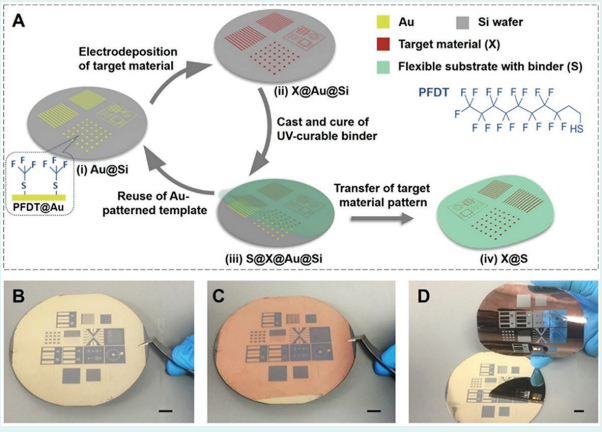
對於可穿戴裝置和生物電子設備而言，具備生物相容性和可被物質滲透的特性尤其重要。這些電子裝置除了需要具備柔軟度而且能發揮功能之外，能否舒適地長時間佩戴，以及確保生物安全亦是重要的考慮因素。 因此，我們採用了多孔和纖維結構，開發出一種能被物質滲透的可拉伸電子裝置。 這些裝置表現出極高的靈活度和伸延性。此外，可滲透的結構增強了裝置的耐磨性和生物相容性，而這些特質對應用於皮膚上甚至植入體內的電子裝置而言，皆十分重要。



Advanced fabrication technologies for large-area and nanoscale patterning on soft substrates
於柔軟基礎物料上大範圍編制納米結構的先進整合技術

This research focuses on developing advanced fabrication technologies that are compatible to new materials and device form factors. Its objective is to develop advanced mask-less fabrication technologies that allow precise control of nanostructures and enable large-area patterning on soft substrates. To attain so, our team has focused on developing high-precision scanning-based printing platforms and high-throughput electrochemical replication platforms.

這項研究的重點是開發先進整合技術，藉以研發出具備不同結構且能適用於不同裝置外形的新物料。我們希望開發出先進的無遮模整合技術，並精確地為柔軟基礎物料大範圍編制出納米結構。為此，我們一直鑽研具高精密度的掃描式打印平台和高性能的電化學複製平台。



An electrochemical replication and transfer technology enabling high-speed and cost-effective fabrication of soft materials and electronics
一種具備成本效益的電化學複製和轉移技術，可以快速製作出柔軟物料及具柔軟度的電子產品

Event Updates

PolyU FSN Grand Opening cum International Conference on Food and Human Health
理大食品科學及營養學系開幕典禮暨食物與人類健康國際會議

13-14 Jul 2023, PolyU

To celebrate the inauguration of the Department of Food Science and Nutrition (FSN), the Department will be hosting a grand opening and an International Conference on Food and Human Health. The conference aims to bring together experts to share scientific knowledge on health-related issues, and promote collaboration between the public sector, industry and academia to pursue impactful research for sustainable development.

為了慶祝食品科學及營養學系(FSN)的成立，學系將於2023年7月13至14日舉辦為期兩天的「理大食品科學及營養學系開幕典禮暨食物與人類健康國際會議」，讓全球知名專家分享最先進的科學知識，並提供一個平台以展示與食品、營養和健康領域相關的研究突破和進展，以及促進公營部門、工業界和學術界之間的科學交流和合作。

Workshop on Optimization, Equilibrium and Complementarity
優化、均衡與互補問題研討會

16-19 Aug 2023, PolyU

The objective of this workshop is to celebrate the milestone achievement of 70 + 50 + 45 in the field of optimization, equilibrium, and complementarity among countries, and to foster sustained development in these fields. 25 speakers including active world-leading young researchers from Australia, Europe, Singapore, the United States and Mainland China will be invited to the workshop.

本研討會旨在慶祝各國於深化合作、均衡和互補範疇方面達到了70+50+45的周年里程碑，並尋求繼續合作和發展的機會。25位來自澳洲、歐洲、新加坡、美國及中國內地的國際著名學者及傑出年輕學者將獲邀出席。

Meeting on Recent Advances in Quantitative Finance
量化金融研究進展會議

27-30 Aug 2023, PolyU

The meeting aims to showcase the latest developments in the field of quantitative finance. The goal is to facilitate interaction and cooperation among researchers worldwide who are working in this field and provide an ideal platform for local students and researchers to gain insight into cutting-edge research.

本會議旨在介紹量化金融領域的最新發展以加強國際間相關研究人員之間的交流及合作，並為本地學生和研究人員提供一個接觸嶄新研究的理想平台。

Faculty Staff 學院教學及科研人員

2022 Guangdong Science and Technology Award – Technology Invention Award

Second Prize	**Dr Tsang Yuen-hong**, *Associate Professor, AP*

The 48th International Exhibition of Inventions Geneva

Prize of the International Federation of Inventors' Association – IFIA; and Gold Medal with Congratulations of the Jury	**Prof. Leung Yun-chung, Thomas**, *Professor, ABCT*
Gold Medal with Congratulations of the Jury	**Dr Chua Song-lin**, *Assistant Professor, ABCT* **Dr Liu Yang**, *GBA Startup Postdoctoral Fellow, ABCT*
Gold Medal	**Prof. Yan Feng**, *Chair Professor of Organic Electronics, AP*
Gold Medal	**Prof. Lau Shu-ping, Daniel**, *Head and Chair Professor of Nanomaterials, AP*
Silver Medal	**Prof. Hao Jianhua**, *Chair Professor of Materials Physics and Devices, AP*
Bronze Medal	**Dr Wong Ka-hing**, *Associate Professor, FSN*

Long Service Award 2022

ABCT

Prof. Chow Ming-cheung, Larry, *Head (ABCT) & Professor*
Dr Kwok Wai-ming, *Associate Professor*
Dr Lee Yoon Suk, Lawrence, *Associate Professor*
Dr Chan Kin-fai, *Senior Research Fellow*
Dr Yan Sau-woon, Clare, *Scientific Officer*
Ms Echo Wan, *Senior Technical Officer*
Mr Shiu Yui-wah, *Technician*
Mr Cheng Lap-yung, *Service Attendant*
Ms Luk Sui-kam, *Service Attendant*
Ms Peggy Kwok, *Assistant Executive Officer*
Ms Leung Ching-yi, Candy, *Clerical Officer II*
Ms Tsang Sau-fung, Carol, *Clerical Officer II*

FSN

Prof. Wong Man-sau, *DoRCMI & Professor*

AMA

Prof. Chen Xiaojun, *DoUBDA & Chair Professor of Applied Mathematics*
Prof. Li Xun, *Professor*
Dr James Huang, *Associate Professor*
Mr Eric Lam, *Assistant Technical Officer*

AP

Dr Choy Siu-hong, *Teaching Fellow*
Mr Ho Kai-hong, *Senior Artisan*

FS

Ms Ivy Lam, *Faculty Secretary*
Ms Sammi Tsui, *Executive Officer*
Ms Patricia Kong, *Clerical Officer II*
Mr Victor Chu, *Clerk*

Faculty Students & Alumni 學院學生與畢業生

Dr Winnie S M Tang-PolyU Student Innovation and Entrepreneurship Scholarship	Tsoi Chi-chung, *Undergraduate Student of AP*
Outstanding Student Award 2022	Ong Chin-yuan, *Undergraduate Student of AP*
Presidential Student Leadership Award	Ng Ka-ho, Kelvin, *Undergraduate Student of AMA*
Presidential Student Leadership Award of Department	Pham Ngoc Mau Tam, *Undergraduate Student of ABCT* Tsao Yu-jui, *Undergraduate Student of AP*
USFHK Taekwondo Competition 2022-23 Championship of the Women's Lightweight Division	Leung Cheuk-yu, Cherry, *Undergraduate Student of AMA*

Pham Ngoc Mau Tam

Awardee of Presidential Student Leadership Award of Department 2022
2022年校長學生領袖獎 – 學系得獎者

– BSc (Hons) in Applied Biology with Biotechnology

Studying at PolyU has strengthened my knowledge and provided me with a hands-on experience to explore my research interests. During my time in the Department of Applied Biology and Chemical Technology (ABCT), I have received tremendous opportunities to participate in several research groups, which helped me discover my passion for studying gut microbiota and tumour microenvironment. For example, the Undergraduate Research and Innovation Scheme (URIS) and the Sponsorship for Internship Enhancement Programme (SIEP) allowed me to work on a project focusing on engineered bacteria that have the potential to kill colorectal cancer cells. This experience was amazing and has inspired me to pursue a career in this field. Despite the challenges faced during the Covid-19 pandemic, I was granted the sponsorship to attend an intensive online research programme from Cambridge, that allowed me to review the synergistic effects of microbiota on improving the efficacy of immune checkpoint inhibitors. I am deeply grateful to all the academic staff in my Department for supporting me wholeheartedly throughout my studies and playing an important role in shaping the person I am today.

應用生物及化學科技學系為我提供了大量參與科研的機會，讓我獲取了不少實踐經驗和知識。當中包括透過Undergraduate Research and Innovation Scheme (URIS) 和實習資助計劃，我參與了一個有關利用基因改造細菌對付結直腸癌細胞的研究，並因此增加了我對腸道菌群和腫瘤微環境的興趣和知識。在疫情期間，我還有幸於劍橋大學就讀了一個有關微生物群和提高免疫系統的網上研究課程，對我的未來發展大有裨益。因此，我格外感謝學系對我的所有栽培，並因而造就了今天的我。

Ong Chin Yuan 王靖元

Awardee of Outstanding Student Award of Faculty 2022
2022年卓越學生獎 – 學院得獎者

– BSc (Hons) in Engineering Physics

My experience studying Physics at PolyU was exceptional. The programme offered me various opportunities to explore both theory and experimental conclusions. Having access to one of the most advanced laboratories in Hong Kong owned by the Department has allowed us to investigate and gather scientific knowledge at the forefront of science.

Whenever I encountered difficulties in understanding the theories, the lecturers were always there to guide us to the answers. Furthermore, as I have always had a strong interest in research, I had the opportunities to work with Dr Lam Chi-hang, Associate Professor of the Department who is an expert in glass transition theory, during my sophomore year.

Outside of the curriculum, I was allowed to participate in the summer Oxbridge programme where I gained learning experience from a world-class institution and made a lot of friends from all around the world. This opportunity would not have been possible without the generous funding provided by PolyU.

我非常享受在理大修讀物理學，當中我學習到了很多物理理論、知識以及實驗技巧。應用物理學系擁有先進的實驗室，讓學生能夠研究前沿的科學難題。每一位老師的資歷都很優秀，每當同學有問題時，老師們都會知無不盡地一一回答。我一直以來對研究都抱有很濃厚的興趣，所以我在大學二年級那年開始加入林志恆博士的研究團隊，專門研究玻璃轉化現象。課程以外，我亦得到理大所頒贈的獎學金，讓我參與了牛津大學的暑期課程。那次暑假我體驗到了頂級大學的教學，以及認識到了來自世界各地的學生。如果沒有理大提供的慷慨資助，一切皆不可能。

Dong Nanxi 董南西

– BSc (Hons) in Investment Science & Finance Analytics

Studying at PolyU has been an invaluable experience for me. The programme I enrolled in offers me a wide range of elective courses, including statistics, computer science, and finance, which allowed me to fully explore my interests. For instance, I found that I was passionate about studying statistics, and some of my classmates discovered their passion in fields like data science and financial engineering. Research opportunities are also abundant outside the classroom, and professors are erudite and supportive that it is exciting to apply what I have learned to tackle real-world challenges under their guidance. When I was in Year 3, I had the opportunity to participate in an exchange programme organized by PolyU, and have spent one semester at the National University of Singapore. Overall, I would say that PolyU has provided me with such a wonderful platform for gaining academic and personal development, as well as international exposure.

在理大求學是我寶貴人生經歷的一部份。我修讀的學科包含很多選修科目，涉獵範圍廣泛，當中包括統計、計算機科學及金融等領域。就讀期間，我們有充份的時間探索自己的興趣所在，譬如我發現自己想繼續鑽研統計學，而我有些同學則發現自己對數據科學和金融工程充滿熱情。課程以外，理大還給予我們很多科研機會；老師們博學且願意幫助學生，在他們的帶領下，我對能夠將專業知識用於解決問題上感到十分興奮。另外，我在大學三年級的時候參與了理大的交換生計劃，在新加坡國立大學度過了一個學期。簡而言之，我十分感謝理大為我提供了這個夢寐以求的平台，讓我在學術和個人成長方面都獲益甚多，而且擴闊了我的國際視野。

Li Weipeng 李偉鵬

– BSc (Hons) in Food Safety and Technology

One of the most fulfilling experiences I had during my university life was participating in an exchange programme. Despite the pandemic, the Department provided opportunities for students to study abroad, and I was fortunate to have spent a semester at the University of Maryland, College Park in the United States. During my exchange, I acquired knowledge about food analytical techniques, foodborne microorganisms, and detection techniques and improved my laboratory skills. In addition, I had the opportunity to participate in Maryland Info Day, which has enriched my academic knowledge and exposed myself to different cultures. Besides, the Department also offers opportunities for undergraduates to participate in research projects, which have allowed me to conduct experiments about the influence of mushroom polysaccharides on the growth of Bifidobacterium species for my Final Year Project. Although my 4-year study at PolyU might not always be smooth, it was a journey of self-discovery, and I am glad to say it was all worthy.

在我的大學生活中最值得回味的經歷之一，就是參加了學系為我們舉辦的交流活動。雖然新冠疫情肆虐，學系仍然為學生提供了出國交流的機會。在美國馬里蘭大學交流期間，我不僅學習了食品分析技術、食源性微生物和檢測技術方面的知識，還改善了實驗技能。我亦有幸參加了馬里蘭大學的招生資訊日。這個交流活動令我的學術知識更加豐富，並讓我接觸到了不同的文化。另外，學系還為學生提供了參與研究項目的機會，讓我能夠為我的大學畢業論文進行香菇多糖對雙歧桿菌物種生長影響的實驗。雖然我在理大的學習過程未必一帆風順，但作為一個自我發現的過程，我十分高興能有所收穫。

Stay Tuned for Our New Publication —
‘Research @ Faculty of Science 2023’!

《Research @ Faculty of Science 2023》即將出版！

We are delighted to announce the release of ‘Research @ Faculty of Science 2023’ in July 2023. In the hope of exploring possible collaborations and building strategic connections within and beyond the Faculty, this booklet summarizes our latest research activities, achievements and collaborations with the industry in both scientific discoveries and technological innovations. Profiles of our Faculty Researchers will be introduced to readers to provide insight into our research directions and how our strong research team supports the development of the Faculty. Stay tuned to our Faculty website to learn more!

本學院欣然宣佈《Research @ Faculty of Science 2023》將於 2023 年 7 月出版。書中將會介紹學院的最新研究方向、發展策略以及與業界共同合作的研究工作及成果。另外，書中亦會介紹學院各學術人員的研究專業及概況，讓讀者了解當中進行中的研究活動，並為學院內外帶來更多與業界交流合作的機會，以科研貢獻社會。如欲了解有關刊物出版的最新消息，請密切留意本院網頁！

PolyU Science Creates Impact 理大科學 探理創新

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