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FACULTY OF SCIENCE
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Popular Science Special Lecture Series:

How Nobel Prizes Are Won

Lectures explaining the science behind
2023 Nobel Prizes in Chemistry, Physiology or Medicine, and Physics

8 Dec 2023 (Fri) · 4:00 – 6:30pm

LT7, Yasumoto International Academic Park, CUHK

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Ψ:改變了你和我的 U 和 I
Ψ:The U with an I that changed U and I

管進 博士
生命科學學院
英語主講

Dr. KOON Chun Alex
School of Life Sciences
In English

如何利用超強激光產生世上最短的紫外光脈衝
How to use intense lasers to generate the shortest ultraviolet pulses in the world

賴裕衡 博士
物理系
廣東話主講

Dr. LAI Yu Hang
Department of Physics
In Cantonese

諾貝爾獎的小巨人---量子點
Quantum Dots: The Tiny Giants of the Nobel Prize

謝應龍 教授
化學系
廣東話主講

Prof. TSE Ying Lung Steve
Department of Chemistry
In Cantonese

免費講座 Free Admission
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管進 博士 Dr. KOON Chun Alex
生命科學學院 School of Life Sciences

假尿苷（Ψ）是尿苷的異構體，是人體大部分messenger RNA（mRNA）的重要成分。在本次講座中，我們將討論 Katalin Karikó 博士和 Drew Weissman 博士關於Ψ在人類免疫系統中的作用的一些突破性發現。他們的發現令高效率的 COVID-19 mRNA 疫苗得以成功開發，並為我們未來對抗其他疾病開闢了新途徑。

Pseudouridine (Ψ) is an isomer of the nucleoside, uridine, that makes up the majority of our messenger RNAs (mRNAs). In this lecture, we will discuss Dr. Katalin Karikó and Dr. Drew Weissman's groundbreaking discoveries regarding the roles of Ψ in the human immune system. Their findings were pivotal to the successful development of effective mRNA vaccines against the COVID-19 pandemic, and opened up new avenues for us to combat other diseases in the future.

如何利用超強激光產生世上最短的紫外光脈衝
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賴裕衡 博士 Dr. LAI Yu Hang
物理系 Department of Physics

三位物理學家因他們在產生阿秒光脈衝的實驗方法方面的開創性工作而獲得2023年諾貝爾物理學獎。其中，Anne L'Huillier和她的同事在1980年代後期發現當惰性氣體原子受到強烈雷射脈衝的照射下可以發射許多高階諧波。利用這種現象，Pierre Agostini和Ferenc Krausz的研究小組在2000年代初各自實現了不同的方法來產生和測量僅持續幾百阿秒（1阿秒=10^{-18}秒）的超短紫外線脈衝。阿秒脈衝成為研究物質內的超快速過程的嶄新工具，使得以前無法實現的觀測成為可能。本講座將提供阿秒脈衝的科學原理及其應用的簡介。

The 2023 Nobel Laureates in Physics have been awarded to three physicists for their pioneering work in developing experimental methods that generate attosecond light pulses. This groundbreaking achievement was built upon the discovery made by Anne L'Huillier and her co-workers in the late 1980s. They found that noble gas atoms, when irradiated by intense laser pulses, could emit many high-order harmonics of light. Making use of this phenomenon, research groups led by Pierre Agostini and Ferenc Krausz independently developed different methods to produce and measure ultrashort ultraviolet pulses lasting only a few hundred attoseconds (1 attosecond = 10^{-18} second) in the early 2000s. Attosecond pulses have provided a novel tool for investigating ultrafast processes within matter, enabling observations that were previously unattainable. In this public talk, we will provide an overview of the scientific principles and applications of attosecond pulses.

諾貝爾獎的小巨人---量子點
Quantum Dots: The Tiny Giants of the Nobel Prize

謝應龍 教授 Prof. TSE Ying Lung Steve
化學系 Department of Chemistry

在這次演講中，我們將走進量子點的納米世界，這些"迷你巨人"在科學和工程界引起了巨大的轟動，並且最近得到了諾貝爾獎委員會的認可。儘管量子點的尺寸極小，它們卻具有巨大的潛力-其獨特的性質賦予了量子點從醫學到科技的各種領域的突破性應用的可能。我們將探討這些微小動力之源的發現及其背後的科學，並討論它們當前的應用和未來的前景，探究這些微小粒子為何產生了如此重要的影響。本次演講旨在揭示量子點的神秘面紗，闡明它們在現代科學和日常生活中的重要性。無論您是科學迷或只是饒有興趣，都歡迎您加入我們，一起探索這些引人注目的粒子的世界。

In this talk, we journey into the nano-world of quantum dots, the 'tiny giants' that have made waves in the scientific and engineering communities and recently earned recognition from the Nobel Prize committee. Despite their minuscule size, quantum dots hold immense potential, paving the way for breakthroughs in diverse fields from medicine to technology with their unique properties. We will explore the discovery and the science behind these tiny powerhouses. Additionally, we will discuss their current applications and future prospects, highlighting why these tiny particles have made such a 'giant' impact. This talk aims to demystify quantum dots, illuminating their significance in modern science and everyday life. Whether you are a science enthusiast or a curious learner, join us on this captivating journey into the world of these remarkable particles.