



柳愛華教授生平 Biography of Prof. Lau Oi-wah

柳愛華教授一生致力在大學及高中推廣科學教育，於中文大學春風化雨三十五載。柳教授1968年加入崇基學院化學系任教。2003年自中文大學榮休。在職期間，積極參與大學教務以及書院服務，柳教授於1994至2003年期間擔任中文大學理學院院長達九年，1983至1986年以及1994至2003年出任香港中文大學校董，於1980年至2003年參與崇基學院院務委員會工作，1986至1995年代表院務委員會出任崇基學院校董。1977年至1985年出任崇基學院獎學金委員會主席，又於1987年至2003年出任崇基學院體育委員會主席。柳教授於2003年榮休後，仍繼續匡助崇基學院的發展，出任學院資深導師，輔助推廣校園健康教育。

出任大學理學院院長九年期間，在柳教授的領導下，理學院擔任前線科學家及普羅市民的橋樑，與大眾一同分享科研成果。柳教授亦明白到，必須培養年輕一輩學子對科學的熱情，以及將科學知識傳遞至各階層人士，拉近科學與香港市民的距離。

理學院全人非常認同柳教授在香港年輕人間推動科普教育的理念，所以當柳教授在2004年辭世後，理學院也肩負起延續這份跟社會大眾傳達科學知識的重任。自2005年起，每年香港中文大學理學院與柳愛華紀念基金都會舉行「柳愛華紀念科學講座」，以延續柳教授獻身於推廣高中科普教育的無私精神。

The late Prof. Lau Oi-wah devoted herself to promoting science education in both university and high school, and left a legacy of 35 years of service to The Chinese University of Hong Kong. As a professor in the Department of Chemistry who also served as Dean of the Science Faculty from 1994 to 2003, Prof. Lau Oi-wah recognized the importance of nurturing young minds of next generation and the necessity to bringing scientific knowledge and advancement to the public.

Professor Lau joined the Department of Chemistry of Chung Chi College in 1968, and retired from the Faculty of Science of The Chinese University of Hong Kong in 2003. Active in affairs at both the college and university levels, Professor Lau served as Member of the University Council (1983 – 1986, 1994 – 2003), Member of College Assembly of Fellows (1980 – 2003), Member of College Board of Trustees (1986 – 1995), Chairperson of College Scholarships, Awards and Financial-Aid Committee (1977 – 1985), and Chairperson of College Physical Education Committee (1987 – 2003). During the nine years as the Dean of Science, Professor Lau led the Faculty of Science in building bridges between scientific frontiers and the masses, showing how science is an inherent as well as an integral part of everyday life. Even after her retirement, Professor Lau continued to assist Chung Chi College in promoting campus health education.

After the passing of Professor Lau in 2004, her former colleagues at the Faculty of Science wished to continue Professor Lau's legacy in promoting science education to the young people of Hong Kong. First held in 2005, the annual Lau Oi Wah Memorial Science Lecture Series – jointly sponsored by the Faculty of Science and the Lau Oi Wah Memorial Fund – has been one of the ways the members of the Faculty of Science at The Chinese University of Hong Kong carry on Professor Lau's dedication to igniting a passion for science among high school students.

策略師 – 統計知識應用於現今社會 Strategist - Application of Statistics in Modern Society



主講 Speaker: 李伯權博士
Dr. Philip P.K. LEE
統計系
Department of Statistics

摘要 Abstract

統計知識廣泛應用於現代社會。其中，策略師會運用統計知識提高業務單元的效率，及從市場價值的錯位中歸納新的想法去謀取利潤。在這次演講中，我首先會以幾個簡單的例子介紹統計策略的想法：例如，如何去評估一個二人參與的硬幣遊戲是否公平，及如何將一個不公平的遊戲（或硬幣）轉化成公平。之後，我將會講述現今社會中，統計策略的想法延伸出的進階應用，如使用金融市場上統計模型，及運用數據分析建立體育博彩及賭博的系統。

Statistics have been widely used in modern society. In particular, strategists apply advanced statistical knowledge to improve the efficiency of business units, and to develop innovative ideas to generate profit through the identification of dislocations in the targeted market. In this talk, the idea of statistical strategy will be introduced through a few examples. For instance, the methodology to assess the fairness of a two-player game based on the flips of an unfair (i.e. biased) coin, and to turn a biased game (or a biased coin) into a fair one. In modern society, the idea of statistical strategy is applied to more advanced areas, such as strategies based on statistical modeling in the financial market, sports betting and gambling.

講者簡介 Speaker's Biography

李伯權博士於卡內基梅隆大學取得博士學位。在畢業後的九年間，他曾經於三間投資銀行擔任定息及利率策略師，包括德意志銀行及摩根大通銀行。自2012年初，李博士於中文大學統計系任職講師。他的研究領域包括收益率曲線及波動建模、金融時間序列分析，和重尾分佈。

Dr. Philip P.K. LEE received his Ph.D. degree in Statistics from Carnegie Mellon University. Prior to joining The Chinese University of Hong Kong as a lecturer in 2012, he had worked as a fixed income and interest rate strategist for nine years in three investment banks, including Deutsche Bank New York, J.P. Morgan Chase Hong Kong and Deutsche Bank Hong Kong. His current research interests include yield curve and volatility modeling, financial time series analysis and heavy-tailed distributions.

自然圖案的形成 How the Leopard Gets Its Spots: Pattern Formation in Nature



主講 Speaker: 鄭波教授
Prof. ZHENG Bo
化學系
Department of Chemistry

摘要 Abstract

本講座將介紹震盪化學反應以及它在圖案形成的作用。圖案的形成在自然界中廣泛存在，有著許多不同的形成機制。其中一個重要的例子是動物表皮的圖案。目前的假說認為這些表皮圖案源自一類被稱為形態發生素的分子。形態發生素控制動物皮膚的顏色。在胚胎發育時，類似震盪反應的過程導致形態發生素在胚胎裏形成了圖案，繼而形成表皮的圖案。一些實驗和理論模型為這個假說提供了依據，並闡釋了許多動物表皮圖案共有的規律。

This talk will discuss the oscillating chemical reaction, and its role in pattern formation. Pattern formation is a prevalent phenomenon in nature, with many distinct mechanisms. One specific example is the pattern on animal coats, for example, the spots on leopards. It has been hypothesized that this pattern originates from a group of molecules called morphogen. Morphogen controls the skin color of animals. During embryonic development, reactions similar to the oscillating chemical reaction lead to patterns of morphogen distribution in the embryo body, which further lead to the patterns on animal coat. The important experiments and theoretical models that support the hypothesis will be presented, and a few more cases of patterns in nature will be discussed.

講者簡介 Speaker's Biography

鄭波教授於1997年本科畢業於北京大學化學系，2002年於杜克大學化學系獲得博士學位。隨後他在芝加哥大學從事了兩年半博士後工作，專著研究微流控的生化分析方法。他於2005年加入中大，現在擔任副教授。他的研究方向是利用微型孔道和反應器進行生化分析。

Professor ZHENG Bo received his B.Sc. in Chemistry from Peking University in 1997, and his Ph.D. from the Chemistry Department of Duke University in 2002. He spent two and a half years in the Chemistry Department of the University of Chicago as a post-doctoral fellow, working on microfluidic methods for bioanalysis. In 2005, he joined the Chemistry Department of the CUHK and is currently an associate professor. His research focuses on bioanalysis using microchannels and microreactors.



香港中文大學理學院
Faculty of Science, The Chinese University of Hong Kong

第十屆 柳愛華紀念科學講座 The 10th Lau Oi Wah Memorial Science Lecture Series

日期 Date: 22 – 3 – 2014
時間 Time: 09:30 – 13:30

地點: 香港中文大學邵逸夫堂
Venue: Sir Run Run Shaw Hall, CUHK

時間 Time	程序表 Programme	講者 Speaker
09:30 – 09:45	登記 Registration	
09:45 – 10:00	開幕禮 Opening Ceremony	
10:00 – 10:35	數學與哈利波特的隱形斗篷 Mathematics and Harry Potter's Cloak (in Cantonese)	鍾子信教授 Prof. Eric CHUNG T. S. Department of Mathematics (數學系)
10:40 – 11:15	液體飛濺的秘密 The Secret of Splashing (in English)	徐磊教授 Prof. XU Lei Department of Physics (物理系)
11:15 – 11:30	小休 Break	
11:35 – 12:10	免疫系統裏的細胞戰爭 Cell War in Our Immune System (in Cantonese)	江紹佳教授 Prof. KONG S. K. School of Life Sciences (生命科學學院)
12:15 – 12:50	策略師 – 統計知識應用於現今社會 Strategist – Application of Statistics in Modern Society (in Cantonese)	李伯權博士 Dr. Philip LEE P. K. Department of Statistics (統計學系)
12:55 – 13:30	自然圖案的形成 How the Leopard Gets Its Spots: Pattern Formation in Nature (in English)	鄭波教授 Prof. ZHENG Bo Department of Chemistry (化學系)

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理學院及柳愛華紀念基金主辦
Organized by The CUHK Faculty of Science & The Lau Oi Wah Memorial Fund

理學院院長的話 Message from the Dean of Science

The Lau Oi-Wah Memorial Science Lecture Series was established in 2005, in recognition of Prof. Lau Oi-Wah's contribution to Science Education at The Chinese University of Hong Kong (CUHK) and to Hong Kong in general.

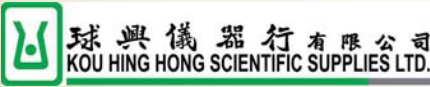
Professor Lau obtained her B.Sc. degree in 1965 from The University of Hong Kong (HKU). She joined Chung Chi College of CUHK as an Assistant Lecturer in 1968, during which she was still working on her Ph.D. thesis. After the completion of her doctoral degree in inorganic chemistry in 1970 at HKU, she became a Lecturer at CUHK. She was promoted to Senior Lecturer in 1982 and Reader in 1993. She was awarded a Leverhulme Foundation Fellowship in 1971 by Imperial College, London and an Honorary Research Fellowship in 1978 by the University of Birmingham. Professor Lau became a Chartered Chemist and an elected Fellow of the Royal Society of Chemistry, U.K., in 1981. She was elected to the Deanship of the Science Faculty for three successive terms, from 1994 to her retirement in 2003.

Professor Lau was a dedicated teacher and a caring research advisor who always put her students' learning and benefit first. During her academic career, she supervised seven Ph.D. students and about 30 M.Phil. students. To many of us who knew her well, she was a passionate educator with a warm personality. During her Deanship, she had successfully pushed for the establishment of many interdisciplinary teaching and research programmes, which remains a direction for curricula developments of the Faculty of Science for the years to come. In addition to university teaching, Professor Lau had also initiated an effort to promote science education in local secondary schools.

After the passing of Professor Lau, her friends and students have established a memorial fund to support the Lau Oi-Wah Memorial Science Lecture Series in order to recognize Professor Lau's contribution to science education in Hong Kong and to commemorate her commitment to education. The Lecture Series continues to inspire young people to pursue further studies and careers in Science. Professor Lau's legacy has indeed lived on through the gift of learning as we all wish.

Henry N.C. Wong, Dean of Science

鳴謝
Acknowledgements



數學與哈利波特的隱形斗篷 Mathematics and Harry Potter's Cloak



主講 Speaker: 鍾子信教授
Prof. Eric T.S. CHUNG
數學系
Department of Mathematics

摘要 Abstract

哈利波特的隱形斗篷可能成為現實嗎？讓我們從數學的角度來看這個問題。實際上，我們可以利用反問題來分析它。反問題是現代應用數學的一個重要分支，應用在許多不同領域，例如雷達設計、地球勘探和醫學影像。如果我們用數學的語言來描述，這個問題就等價於通過區域邊界的測量來確定其內部的性質。其中，解的唯一性是關鍵課題。事實證明我們可以構造出解不唯一的模型。因此，在特定頻率的光源下，我們也可以構造出透明的魔法斗篷，讓哈利波特的隱形斗篷成為現實。

Is Harry Potter's invisibility cloak possible? We will give an answer to this question in a mathematical perspective. In particular, we will present an overview of an important topic in modern applied mathematics called Inverse Problems, which has a wide variety of applications, such as radar design, earth exploration and medical imaging. Mathematically, it is a problem of determining the internal properties of an object by boundary measurements. One crucial issue is the uniqueness of solution. It turns out that one can construct examples having non-unique solutions. This allows the construction of cloaking material that is invisible for certain frequencies of light.

講者簡介 Speaker's Biography

鍾子信教授於香港中文大學獲得理學士及哲學碩士學位。他於加州大學洛杉磯分校獲得博士學位。2008年加入香港中文大學之前，鍾教授受聘於加州大學爾灣分校及加州理工學院。他目前的研究興趣是偏微分方程數值解和反問題。

Professor Eric T.S. CHUNG obtained his B.Sc. and M.Phil. degrees from The Chinese University of Hong Kong, and his Ph.D. degree from University of California, Los Angeles (UCLA). He was Visiting Assistant Professor in University of California, Irvine and von Karman Instructor in California Institute of Technology (Caltech) before joining The Chinese University of Hong Kong in 2008. His current research interest is numerical solution of partial differential equations and inverse problems.

液體飛濺的秘密 The Secret of Splashing



主講 Speaker: 徐磊教授
Prof. XU Lei
物理系
Department of Physics

摘要 Abstract

當液滴以足夠的撞擊速度撞在固體表面上，會出現四處飛濺的現象。這再自然不過的日常現象，難道存在着不為人知的秘密嗎？我們的研究揭示了這樣一個隱藏了一百多年的秘密：空氣在液體飛濺中起着決定性的作用！當我們把空氣的壓強減弱到一定程度時，原本的四處飛濺現象徹底消失了！一系列的測量顯示轉變壓強隨著氣體的分子量和撞擊速度的改變而變化。我們的數據證明了液體的飛濺和空氣的壓縮緊密相關。這一新發現揭示了飛濺現象的新機制並提供了有效的控制手段。它對很多工業應用，比如噴墨打印和表面噴塗處理，可以起到重要的指導作用。

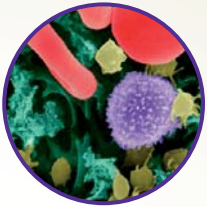
What causes the splashing when a liquid drop hits a solid surface? Recently, we discovered a striking phenomenon: on a smooth surface, splashing can be completely suppressed by decreasing the pressure of the surrounding gas. The threshold pressure where a splash first occurs is measured as a function of the impact velocity and found to depend on the molecular weight of the gas and the viscosity of the liquid. Both experimental scaling relations support a model in which the compressibility of the gas is responsible for creating the splashing. This new discovery provides new evidence for the fundamental mechanism of splashing and could have important applications in many splashing-related industrial processes.

講者簡介 Speaker's Biography

徐磊教授於中國科學技術大學和芝加哥大學分別獲得理學士及博士學位，隨後在哈佛大學進行博士後研究。他於2007年加入香港中文大學物理系。他現在的研究興趣以軟凝聚態物理、流體力學、及複雜流體的實驗為主。

Professor XU Lei obtained his B.Sc. from The University of Science and Technology of China, and his PhD from The University of Chicago. He completed his post-doctoral research at Harvard University and joined The Chinese University of Hong Kong in 2009. His current research interest includes soft condensed matter, fluid mechanics, and complex fluids.

免疫系統裏的細胞戰爭 Cell War in Our Immune System



主講 Speaker: 江紹佳教授
Prof. KONG S.K.
生命科學學院
School of Life Sciences

摘要 Abstract

我們每天都與許多微小的敵人作戰。這些敵人可以是致病或非致病的生物諸如細菌、病毒、真菌、寄生蟲、甚至是癌細胞。在通常情況下，我們並不察覺這些戰役正在發生，因為我們的免疫系統會自動自覺，不需要任何指引便提供最好的保護。在這個講座中，我將與大家分享我們的免疫系統如何運作，背後的重要概念和如何應用這些概念作診斷和治療疾病之用。

Every day we are at war with many tiny enemies. These enemies can be pathogenic or non-pathogenic agents such as bacteria, viruses, fungi, parasites and even cancer cells. Normally, we are not aware that these battles are taking place every minute. Our immune system works in such a way to provide the best protection without asking for instructions. In this science lecture, I will share with you the key concepts of how our immune system implements this search-and-destroy mission, and also how to apply these concepts in disease diagnosis and treatment.

講者簡介 Speaker's Biography

江紹佳教授於1989年由香港中文大學取得生物化學博士學位。1991年加入中大生化系教授免疫學及分析生物化學。科研方面，江教授致力研究癌細胞生化反應和開發生物傳感器，並已發表百多篇學術論文。

Professor KONG S.K. received his Ph.D. degree in Biochemistry from The Chinese University of Hong Kong in 1989. He then joined CUHK as an academic staff in the Department of Biochemistry in 1991 teaching immunology and analytical biochemistry after post-doctoral training. Professor Kong's research area is in cancer biochemistry and biosensor development. He has published more than 100 scientific papers in academic journals.