

#### 摘要 Abstract

希格斯和恩勒特半世紀前發現「布繞特-希格斯-恩勒特機制」,解釋基本粒子的質量之 源·因而獲頒2013年的諾貝爾物理學獎。我將會簡單介紹基本粒子如何獲取質量及其重 要性。我亦將簡述在歐洲核子研究組織(CERN)的大型強子對撞機(LHC)實驗,如何找尋 希格斯粒子(「上帝粒子」),以及這些基礎物理研究怎樣影響着我們的生活。

The 2013 Nobel Prize in Physics has been awarded to François Englert and Peter Higgs "for the theoretical discovery of a mechanism that contributes to our understanding of the origin of mass of subatomic particles, and which recently was confirmed through the discovery of the predicted fundamental particle, by the ATLAS and CMS experiments at CERN's Large Hadron Collider". I will explain in simple terms how the masses of elementary particles arise from the Brout-Englert-Higgs mechanism and why it is of fundamental importance in Physics. I will also discuss the experimental search for the Higgs particle at the Large Hadron Collider, CERN, and how such fundamental physics research impact our lives.

#### 講者簡介 Speaker's Biography

朱明中教授於美國加州理工學院獲得理學士及博士學位。1995年加入香港中文大學之 前、受聘於麻省理工及加州理工學院從事研究工作。他現在的研究興趣以天體物理、字 宙論、及粒子物理爲主。

Professor Chu Ming-chung obtained his B.Sc. and Ph.D. degrees both from California Institute of Technology (Caltech). He held research positions at MIT and Caltech before joining The Chinese University of Hong Kong in 1995. His current research interests include astrophysics, cosmology, and particle physics.



愛華教授一生致力在大學及高中推廣科學教育·於中文 வ化兩三十五載・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·83至86年以及94至03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,86至95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03年榮休後・仍繼續匡助崇基學院的發 展、出任學院資深導師、輔助推廣校園健慶教育。

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·與大衆一同分享科研成果。柳教授亦明白到·必須培養年輕一輩學子對科學的熟 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衆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·

he 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.





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

# 第九屆 柳愛華紀念科學講座 The 9<sup>th</sup> Lau Oi Wah Memorial **Science Lecture Series**

日期 Date:	16-11-2013	
寺間 Time:	09:30 - 12:30	
也點 Venue:	香港中文大學邵逸夫堂	
	Sir Run Run Shaw Hall, CUH	

香港中文大學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

講座程序表 Lecture Series Schedule		
時間 <b>Time</b>	節目 Programme	講者 Speaker
09:30-09:45	進場及登記 Registration	
09:45-10:00	開幕禮 Opening Ceremony	
10:00–10:45	細胞内囊泡的運輸"物流系統"研究榮獲諾貝爾獎 The traffic control system in our cells wins Nobel Prize	姜里文教授 Prof. JIANG Liwen
10:45–11:30	漫談電腦在研究化學和生物問題上的應用 Looking through the computational microscope how computers help us understand chemical and biological systems	王一教授 Prof. WANG Yi
11:30– 11:45	小休 Break	
11:45–12:30	「上帝粒子」、與我何干? The 'God Particle' – what it is and why we care	朱明中教授 Prof. CHU Ming-chung

www.cuhk.edu.hk/sci/memorialtalk



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

he 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





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## 細胞內囊泡的運輸"物流系統"研究 榮獲諾貝爾獎

The Traffic Control System in Our Cells Wins Nobel Prize



#### 摘要 Abstract

細胞是生命體的基本單位。細胞的正常功能依賴於細胞內蛋白質的準確運輸和亞細胞 定位。而細胞內蛋白質的動態變化和亞細胞定位受控於整個囊泡運輸系統,包括類 似 "GPS"功能的定位系統、運輸工具 "囊泡"以及運輸信號等。這個講座主要探討此 囊泡運輸 "物流系統"在我們細胞內工作的原理及其生物學意義,並將介紹對此領域做 出重要貢獻的科學家。

Cells are the basic unit of life. Cellular functions depend on the proper subcellular localization of proteins. The dynamics and localization of proteins inside a cell are highly regulated by the vesicular traffic control system, including the GPS, transport vesicles and traffic signals. This talk will discuss the principles and biological significance of such system in our cells as well as the great scientists making significant contributions in this area.

#### 講者簡介 Speaker's Biography

姜里文教授在加拿大西蒙菲莎大學獲得博士學位。他在2000年加入香港中文大學,並於 2007年晉升爲教授。姜教授曾獲得多項享有聲望的獎項包括2009-2010年度的 "裘槎優秀 科研者獎",以及於2013年獲選爲"理學院傑出學人"。他的研究主要關注植物細胞中蛋 白運輸,以及細胞器生物形成的分子機制。

Professor Jiang received his PhD from Simon Fraser University. He joined CUHK in 2000 and was promoted to professor in 2007. He has received several prestigious awards including the Croucher Senior Research Fellowship 2009-2010 and Outstanding Fellow of the Faculty of Science 2013. His research focuses on the molecular mechanisms of protein trafficking and organelle biogenesis in plant cells. Recently, Professor Jiang was awarded HK\$47 million funding in the Sixth Round of Areas of Excellence (AoE) Scheme to establish the 'Centre for Organelle Biogenesis and Function'.

主講 Speaker:

Prof. Liwen Jiang

姜里文教授

**生命科學學院** School of Life Sciences

### 漫談電腦在研究化學和生物問題上的應用

Looking through the computational microscope --how computers help us understand chemical and biological systems



主講 Speaker: 王一教授

上一致反 Prof. Yi Wang 物理系 Department of Physics

#### 摘要 Abstract

2013年的諾貝爾化學獎頒授予三位科學家,以表揚他們為複雜的化學系統創立了多尺度 的電腦模型。這獎項彰顯了電腦與電腦程式對現今化學和生物系統研究的關鍵應用。事 實上,問題的廣泛性可遍及電子從一個原子核跳向另一個原子核所產生的化學反應,以 至模擬藥物如何與身體裡的目標蛋白結合等化學反應,均可透過電腦程式作出分析。這 些研究是通過三位諾貝爾得獎者首創以經典物理學糅合截然不同的量子物理學,進行多 重分解所得出的。透過幾個例子,我將會簡單介紹這些研究方法、其成功之處以及未來 的挑戰。

The 2013 Nobel Prize in Chemistry was awarded to three scientists for their work in the development of computer models for complex chemical systems. This award highlights the wide application of computers and computational methods in today's scientific study of chemical and biological systems. Indeed, problems ranging from how a chemical bond forms between two atoms to whether a drug molecule can bind to a certain protein are all being studied using computers. These studies are based on methods pioneered by the three Nobel laureates, who combined classical physics with quantum mechanics to obtain a multi-resolution picture of the system under study. Through a few examples, I will briefly introduce these methods and discuss their success and the remaining challenges.

#### 講者簡介 Speaker's Biography

王一教授2003年畢業於浙江大學,並於2008年在伊利諾伊大學取得生物物理博士學位。她 隨後進入加州大學聖達戈分校進行博士後工作。王一教授於2012年加入中文大學物理系, 從事計算生物學研究,主力開發和應用計算方法對生物分子系統進行模擬。現在她的研究 工作包括抗菌肽的選擇性、受體-藥物的結合強度以及一系列的生物膜系統。

Prof. Wang Yi graduated from Zhejiang University in 2003 and received her Ph.D. in biophysics from the University of Illinois at Urbana-Champaign in 2008. She then worked as a postdoctoral researcher at University of California, San Diego. Professor Wang joined the Department of Physics of CUHK in 2012. Her research is focused on developing and applying computational methods to study biomolecules. Currently, her work includes selectivity of antimicrobial peptides, receptor-ligand binding affinity calculation, and simulations of a variety of membrane systems.