

北極之旅 A tale of two seasons in the Arctic



主講 Speaker:

劉琳 教授
Professor LIU Lin

地球系統科學課程
Earth System Science Programme

摘要 Abstract

One of the Earth's final frontiers, the Arctic is vast, freezing, and seems too distant and isolated to be relevant to the rest of the world. The Arctic, in fact, has experienced more rapid warming than anywhere else on Earth over the past decades. Consequently, ice is melting in the Arctic Ocean and on land; frozen ground is thawing; polar bears are starving to death; vegetation is growing. With rising sea levels, climate feedback loops, ecological changes, new shipping routes, and opportunities for oil and mineral extraction, these drastic changes in the Arctic posing immediate and lasting impacts around the globe. Based on Professor Liu's scientific expeditions to the Arctic, he wants to tell stories about what polar scientists did in two seasons of extreme in Alaska: the bitterly frigid winter and the surprisingly flaming summer.

北極，一個地球上人跡罕至的區域，遼闊而又常年冰封，過於遙遠和孤立，似乎很難與世界上其他地方相聯繫。實際上，北極在過去的幾十年裡已經比地球其他任何地方變暖得更快。這導致在北極，海洋、陸地上的冰都在融化，凍土消融，北極熊難以捕獵而餓死，植被覆蓋擴張。隨著海平面上升，氣候反饋，生態變化，新航線開闢，新石油和礦產資源的出現，這些在北極產生的劇烈變化將對全球產生直接和持久的影響。基於多次北極科學考察的經歷，劉教授將與和大家分享一些關於我們在冬夏兩個極端季節開展科學考察的故事。

講者簡介 Speakers Biography

Professor Liu Lin is an Assistant Professor of Earth System Science Programme, an interdisciplinary programme under the Faculty of Science. His study applies state-of-the-art geophysical and remote sensing techniques to the Earth's complex cryosphere (namely, the portion on the Earth's surface where water is frozen, including glaciers, sea ice, frozen ground, snow, etc). He aims to quantify and understand their significant changes in a warming climate. He conducted six field trips in polar regions including Alaska, Greenland, and the Tibetan Plateau. Prof. Liu is also collaborating with the Jockey Club Museum of Climate Change to develop a science-based outreach program in Hong Kong on polar changes in a warming climate.

劉琳教授是香港中文大學地球系統科學課程的助理教授。在地球表面上，有一部分區域水是處於凍結狀態，例如冰川、海冰、凍土和積雪等，稱之為冰凍圈。劉教授使用先進的地球物理和遙感技術研究冰凍圈的複雜現象，目的是認識和評估在氣候變暖下冰凍圈的顯著變化。他的組織曾參加六次實地考察，考察區域包括北極如阿拉斯加、格林蘭和青藏高原。劉教授和賽馬會氣候變化博物館合作，在香港推動一個以科學為基礎的大眾普及工作，關注氣候變暖下的南北極變化。



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，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。

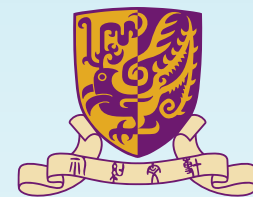
出任大學理學院院長九年期間，在柳教授的領導下，理學院擔任前線科學家及普羅市民的橋樑，與大眾一同分享科研成果。柳教授亦明白到，必須培養年輕一輩學子對科學的熱情，以及將科學知識傳遞至各階層人士，拉近科學與香港市民的距離。

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.



香港中文大學
The Chinese University of Hong Kong

第十三屆

柳愛華紀念科學講座

The 13th Lau Oi Wah Memorial Science Lecture Series

日期： 2017年2月25日 (星期六)
Date： 25 February 2017 (Saturday)

時間： 上午九時三十分 至 下午十二時三十分
Time： 9:30a.m. - 12:30p.m.

地點： 香港中文大學鄭裕彤樓1號演講廳
Venue： LT1, Cheng Yu Tung Building, 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 - 10:45 | 香港的珊瑚值得保護嗎？ Are Hong Kong corals worth saving? | 生命科學學院 崔佩怡 博士 Dr. CHUI Pui Yi Apple School of Life Sciences |
| 10:45 - 11:35 | 當數學遇上醫學 Mathematics meets Medicine | 數學系 雷樂銘 教授 Prof. LUI Lok Ming Ronald Department of Mathematics |
| 11:35 - 11:45 | 小休 Break | |
| 11:45 - 12:30 | 北極之旅 A tale of two seasons in the Arctic | 地球系統科學課程 劉琳 教授 Prof. LIU Lin Earth System Science Programme |

www.cuhk.edu.hk/sci/memorialtalk



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

Welcome to the 13th Lau Oi-Wah Memorial Science Lecture Series at The Chinese University of Hong Kong (CUHK). Commencing in 2005, this annual lecture series is organised in recognition of Professor Lau Oi-Wah's contribution to promoting science education.

Having obtained a B.Sc. degree from The University of Hong Kong, Professor Lau joined Chung Chi College of CUHK as an Assistant Lecturer in 1968, whilst still working on her Ph.D. thesis. She became a Lecturer at CUHK upon the completion of her doctoral degree in inorganic chemistry in 1970. After having been awarded the Leverhulme Foundation Fellowship in 1971 by Imperial College, London and the 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. Following her success in the academic career in research, Professor Lau was promoted to Senior Lecturer in 1982; Reader in 1993; and was elected to the Deanship of the Faculty of Science for three successive terms, from 1994 until her retirement in 2003.

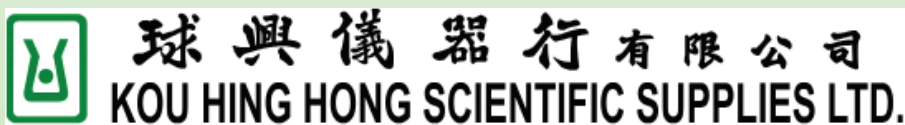
Professor Lau was a dedicated teacher and a caring research advisor, who always put her students' learning and benefits first. During her academic career, she supervised 7 Ph.D. students and about 30 M.Phil. students. To those who knew her well, she was undoubtedly a passionate educator with a warm personality. During her Deanship, she had successfully pushed for the establishment of many interdisciplinary teaching and research programmes, a philosophy of which continues to be a direction for curricula developments of the Faculty of Science. In addition to university teaching, Professor Lau had also initiated efforts to promote science education in local secondary schools.

After the passing of Professor Lau, her friends and students established the Lau Oi-Wah Memorial Fund in order to commemorate her commitment to education. Supported by the fund, the Lau Oi-Wah Memorial Science Lecture Series is run annually to promote public engagement in science. The Lecture Series continues to inspire young people to pursue further studies and careers in scientific fields. Professor Lau's legacy has indeed lived on through the gift of learning as we all wish.

As aspiring scientists, I hope that you will be able to take home some fundamental concepts as well as some inspiration from this Lecture Series. By using your creativity, I look forward to all of you developing your innovative ideas into new technology for the advancement of our ever-changing society.

黃佩怡

Henry N.C. Wong, Dean of Science



鳴謝
Acknowledgements

香港的珊瑚值得保護嗎？ Are Hong Kong corals worth saving?



主講 Speaker:

崔佩怡 博士
Dr. CHUI Pui Yi Apple

生命科學學院
School of Life Sciences

摘要 Abstract

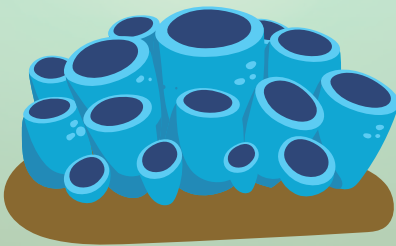
Under the waves, thousands of sea creatures can be found living in the cities made up of corals. But what do you know about corals? And what are the consequences if we continue to treat corals so carelessly? Home to eighty-four species of hard corals, Hong Kong's coral diversity is considered quite rich by international standards. Yet, there are pressures from urban development, land reclamation, increase eutrophication from sewage etc.. Given the small size of Hong Kong, is it worth to put in resources to save our corals? During the seminar, Dr Chui will guide you on a journey into this magnificent parallel world in Hong Kong. Drawing on her latest research, she will also share with you the potential roles of Hong Kong corals in future under projected climate changes, and discuss the importance of marine conservation in marginal coral communities.

由石珊瑚為主體所建造的海底城市裡，各式生物生活其中。你對珊瑚認識有多少？如果我們不好好保護珊瑚，會有什麼後果？香港有八十四種石珊瑚在境內生長，根據國際標準，品種可算豐富。然而，香港珊瑚也正面對城市發展帶來的影響。在香港這塊狹小的土地上，我們是否值得投放資源保護珊瑚？講座中，崔博士將帶領大家一同在香港珊瑚間穿梭，見證這充滿生命的水底世界。並探討香港珊瑚在氣候變化中的潛在角色和保育的重要。

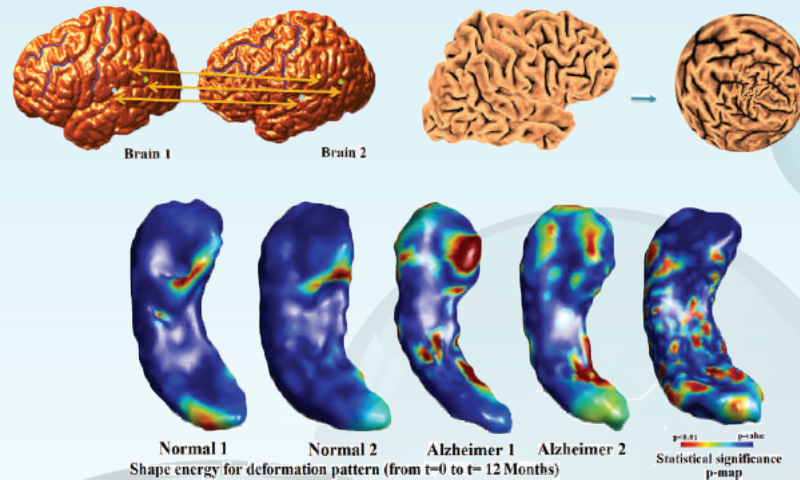
講者簡介 Speakers Biography

Dr Apple P.Y. Chui is a lecturer in the School of Life Sciences at The Chinese University of Hong Kong (CUHK). She obtained her B.Sc. degree in Biology from The Hong Kong University of Science and Technology, Mphil and PhD degrees in Environmental Science and Biology from CUHK. Since 2008, Dr Chui has been studying corals in Hong Kong. Her research interests include reproductive and larval ecology of corals, coral recruitment dynamics and restoration of corals using coral sexual reproduction.

崔佩怡博士現為中文大學生命科學學院講師。她在香港科技大學獲得生物的理學士學位，並於香港中文大學獲得環境科學碩士及生物博士學位。崔博士自2008年開始在香港進行珊瑚研究，她的研究方向包括珊瑚成長初階段研究，幼苗野外入添量調查，及利用有性繁殖培育珊瑚等復育工作。



當數學遇上醫學 Mathematics meets Medicine



主講 Speaker:

雷樂銘 教授
Prof. LUI Lok Ming Ronald

數學系
Department of Mathematics

摘要 Abstract

Physicians commonly diagnose diseases and study disease progression using 2D medical images, such as MRIs or CTs. In recent years, mathematicians have developed a novel technology for 3D imaging and shape analysis using differential geometry. This technology can be used to analyse structural changes of anatomical structures and organs, which can be applied to diagnosis and detection of various diseases (such as Alzheimer's disease). Let's explore the relationship between mathematics and medicine.

一般來說，醫生需透過圖像掃描技術，例如磁力共振，以獲取病人身體各部分的二維圖像，然後作出診斷。近年，數學家成功以幾何學發展了一套嶄新方法自動處理三維圖像，並有效分析各器官的形狀及結構，有助病人及早發現一些難以診斷的疾病，例如腦退化症。究竟這種嶄新方法是什麼呢？

講者簡介 Speakers Biography

Professor Lui Lok Ming Ronald is an Associate Professor of the Department of Mathematics at The Chinese University of Hong Kong (CUHK). He received his Ph.D degree in Applied Mathematics from the University of California at Los Angles (UCLA) in 2008, under the supervision of Professor Tony Chan. Before joining CUHK, he worked as a postdoctoral scholar for two years at Harvard University, mentored by Professor Yau Shing-Tung .

Prof. Lui's research focuses on solving the fundamental problems of computing quasi-conformal structures of Riemann surfaces and applying them to real-world applications. Together with his collaborators, Prof. Lui systematically developed both the theories and numerical algorithms of computational quasi-conformal geometry. These invented methods have been successfully applied in various fields, such as surface registration in medical imaging, global surface parameterization in computer graphics, shape analysis and classification in computer visions and so on.

雷樂銘教授現任香港中文大學數學系副教授，他於2008年在美國加州大學洛杉磯分校取得博士學位，師承現任香港科技大學校長及世界著名應用數學家陳繁昌教授。及後，雷博士前赴世界頂級學府哈佛大學，跟隨另一數學界翹楚丘成桐教授接續博士後的研究，並於兩年後獲香港中文大學聘任。

雷教授主要研究黎曼曲面上擬共形結構的計算問題以及其技術於現實生活的應用。雷教授與他的團隊有系統地研發計算擬共形幾何學的理論以及發明了多種數值算法。這些新發明的方法，已被證明能有效地應用在不同的範疇，例如醫學圖像中的曲面對準、電腦圖象中的全局曲面參數化、電腦視覺中的圖形分析及分類等等。

