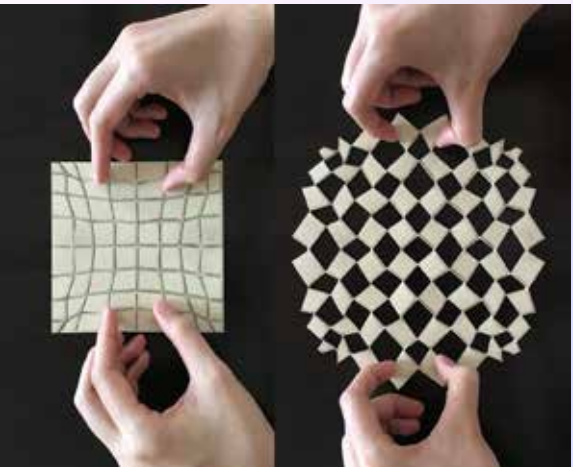


# Origami and Kirigami: Art, Mathematics, Science and Technology

摺紙與剪紙：藝術、數學、科學與科技



## Abstract 摘要

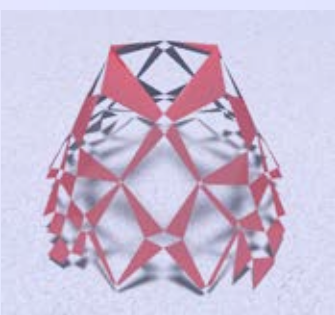
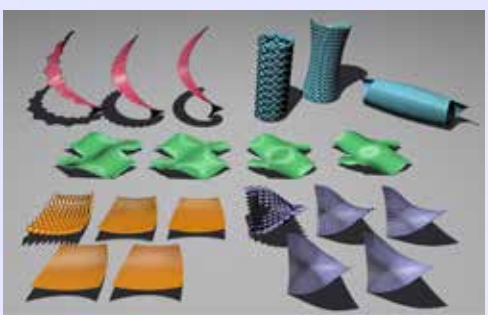
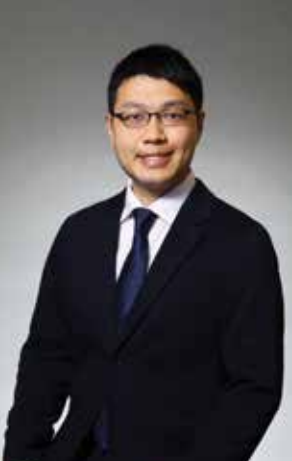
Origami and kirigami are the traditional art of paper folding and cutting. In recent years, the concept of origami and kirigami has been applied to many problems in science and engineering, such as the design of soft robots, flexible electronics, biomedical devices, and even foldable space telescopes. In these applications, mathematics plays an important role in designing suitable folding and cutting patterns on the materials. For instance, if we want to allow some robotic structures and materials to flexibly morph into different shapes via origami and kirigami techniques, then we will need to ensure that the origami and kirigami patterns satisfy certain geometric equations related to angles and lengths. In this lecture, we will explore this wonderful connection between art, mathematics, science and technology, try different paper folding and cutting methods together, and further understand the latest advancements in origami and kirigami.

摺紙和剪紙是傳統藝術。在近年，摺紙和剪紙的概念被應用於許多科學和工程學上的問題，例如軟體機器人、柔性電子材料、生物醫學器材、甚至是可摺式太空望遠鏡的設計。在這些應用中，數學在設計適當的材料摺法和剪法上擔任一個非常重要的角色。例如，如果我們想透過摺法和剪法令一些機械結構和材料可以靈活地變成不同形態，那麼我們則需要確保相關的摺法和剪法符合一些關於角度和長度的幾何方程式。在是次講座中，我們將會探索這個在藝術、數學、科學與科技之間的奇妙聯繫，一起嘗試不同的摺紙與剪紙方法，再進一步了解摺紙和剪紙的最新發展。

## Speaker Biography 講者簡介

Professor CHOI Pui Tung Gary is a Vice-Chancellor Assistant Professor in the Department of Mathematics at The Chinese University of Hong Kong. He obtained his Ph.D. in Applied Mathematics from Harvard University and worked as an Instructor in Applied Mathematics at the Massachusetts Institute of Technology. His research interests include applied and computational geometry, interdisciplinary mathematical modeling, and metamaterial design.

蔡沛彤教授現為香港中文大學數學系校長特聘助理教授。他於美國哈佛大學取得應用數學哲學博士學位，並曾於美國麻省理工學院任職應用數學講師。他的研究方向包括應用和計算幾何、跨學科數學建模和超材料設計。



Professor CHOI Pui Tung 蔡沛彤教授  
Department of Mathematics 數學系

# Recent Advances in Volcano Monitoring

火山監測的最新進展



## Abstract 摘要

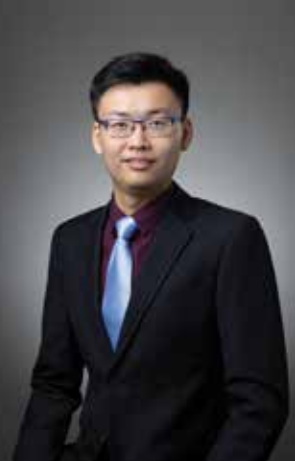
Speaker will share about the different types of volcanic eruptions and hazards, as well as discuss how recent advances in volcano monitoring both on land and in the ocean (including the application of machine learning) can improve our forecasting ability. There will also be a demonstration about how subaerial and submarine eruptions form different types of rocks.

講者將分享不同類型的火山爆發和災害，並討論陸地和海底火山監測的最新進展（包括機器學習的應用）如何提高我們的預測能力。此外，也將示範陸地和海底火山噴發如何形成不同類型的岩石。

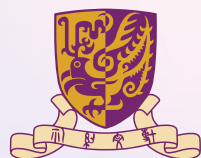
## Speaker Biography 講者簡介

Professor TAN Yen Joe is an Assistant Professor in the Department of Earth and Environmental Sciences at The Chinese University of Hong Kong. His research focuses on earthquake, volcanic, and earth surface processes, including those occurring beneath the ocean.

陳衍佐教授是香港中文大學地球與環境科學系的助理教授。他的研究專注於地震、火山及地表過程，包括海洋底部發生的相關現象。



Professor TAN Yen Joe 陳衍佐教授  
Department of Earth and Environmental Sciences 地球與環境科學系



香港中文大學理學院  
FACULTY OF SCIENCE  
THE CHINESE UNIVERSITY OF HONG KONG



# The 19<sup>th</sup> Lau Oi Wah Memorial Science Lecture Series

## 第十九屆柳愛華紀念科學講座

Organised by The CUHK Faculty of Science and The Lau Oi Wah Memorial Fund  
香港中文大學理學院與柳愛華紀念基金主辦

25 April 2025 (Friday)  
2:30 pm - 4:30 pm

LT6, Yasumoto International Academic Park (YIA), CUHK  
香港中文大學康本國際學術園6號演講廳

## 鳴謝 Acknowledgements





# Message from the Dean of Science

## 理學院院長的話



Welcome to the 19th 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 BSc 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 PhD thesis. She became a Lecturer at CUHK upon the completion of her doctoral degree in inorganic chemistry in 1970. After receiving the Leverhulme Foundation Fellowship in 1971 by Imperial College, London, and the Honorary Research Fellowship in 1978 from 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 research in academia, Professor Lau was promoted to Senior Lecturer in 1982, Reader in 1993, and was then 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 seven PhD 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 successfully pushed for the establishment of many interdisciplinary teaching and research programmes, a philosophy of which continues to be a direction for curricula developments at 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 “Memorial Fund of Professor Oi-wah Lau” in order to commemorate her commitment to education. Supported by the fund, the Lau Oi Wah Memorial Science Lecture Series runs 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.

The Faculty of Science will continue to carry on Professor Lau's legacy and devotion to promoting science to the general public. I hope today's lectures will ignite your passion for science.

Chunshan SONG  
Dean of Science  
Wei Lun Professor of Chemistry

# Programme Rundown

## 程序表

14:30

Opening Ceremony  
開幕禮

14:40

Origami and Kirigami: Art, Mathematics, Science and Technology  
摺紙與剪紙：藝術、數學、科學與科技

by Professor CHOI Pui Tung  
Department of Mathematics  
數學系 蔡沛彤教授

15:30

Recent Advances in Volcano Monitoring  
火山監測的最新進展

by Professor TAN Yen Joe  
Department of Earth and Environmental Sciences  
地球與環境科學系 陳衍佐教授

# Biography of Professor Lau Oi Wah

## 柳愛華教授生平



The late Professor 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, Professor Lau Oi Wah recognised the importance of nurturing young minds of the 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 at the age of 63, 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.

柳愛華教授一生致力在大學及高中推廣科學教育，於中大春風化雨三十五載。柳教授一九六八年加入崇基學院化學系任教。二零零三年自中大榮休。在職期間，積極參與大學教務以及書院服務，柳教授於一九九四至二零零三年期間擔任中大理學院院長達九年，八三至八六年以及九四至零三年出任香港中文大學校董，於一九八零年至二零零三年參與崇基學院院務委員會工作，八六至九五年代表院務委員會出任崇基學院校董。一九七七年至一九八五年出任崇基學院獎學金委員會主席，又於一九八七年至二零零三年出任崇基學院體育委員會主席。柳教授於零三年榮休後，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。柳教授致力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，所以當柳教授在二零零四年辭世後，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。自二零零五年起，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。