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

SCIENCE FACULTY

50th Anniversary Symposium

Date: 6 June 2013 (Thursday)
Time: 9:15a.m. - 12:30p.m.
Venue: L1, Science Centre, CUHK

Embrace our Culture
Empower our Future
香港中文大學五十周年
50th Anniversary of CUHK

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Event Programme

09:15 - 09:30 Opening Remarks

09:30 - 10:25 **"Stardust: the Cosmic Seeds of Life"**
Professor Sun Kwok
Chair Professor of Physics and Dean of Science,
The University of Hong Kong

10:25 - 10:50 Tea Break

10:50 - 11:45 **"Circulating DNA in Plasma in Health and Disease"**
Professor Dennis Yuk-ming Lo
Director of the Li Ka Shing Institute of Health Sciences,
Li Ka Shing Professor of Medicine,
Professor of Chemical Pathology,
Associate Dean of Medicine (Research),
The Chinese University of Hong Kong

11:45 - 12:15 **"Academic Life at CUHK: Episodes and Reminiscence"**
Professor Thomas Chung-wai Mak
Emeritus Professor of Chemistry,
The Chinese University of Hong Kong

12:15 - 12:30 Event Closing

卓越研究 Excellence in Research

Message from the Dean of Science

This is the 8th year the Faculty of Science has held a Faculty Research Day. In honour of the Faculty's 50th anniversary, we have invited a distinguished panel of speakers to share their insight into diverse fields of cutting-edge research. It is hoped that through this event, even more opportunities for collaboration would sprout and yield fruitful results.

In the spirit of the Faculty's mission to break new paths in the quest for new frontiers of knowledge, it gives us great pleasure to present to you three researchers who are at the forefronts of their fields of expertise. First of all, Prof. Sun Kwok, Chair Professor of Physics and Dean of Science at The University of Hong Kong, is a world-renowned astrophysicist, who will be delivering a talk on an overview of the discoveries in astroscience with implications to our theories on the origins of life in the universe. Secondly, the Faculty has invited Prof. Dennis Y.M. Lo, Director of the Li Ka Shing Institute of Health Sciences, Li Ka Shing Professor of Medicine, Professor of Chemical Pathology, and Associate Dean of Medicine (Research) of The Chinese University of Hong Kong. Prof. Lo is a multi-award winning researcher in the field of molecular biology, most notably for his discovery of cell-free fetal DNA, RNA and mRNA in the plasma of pregnant women, paving the way for non-invasive prenatal diagnosis. Last but not least, we have invited Prof. Thomas C.W. Mak, Professor Emeritus of the Department of Chemistry at The Chinese University of Hong Kong to speak at the Symposium. Prof. Mak has been a member of the Science Faculty since 1969, and will share with us his reminiscence of the days gone by of the Faculty from its earliest years to the present.

It is our pleasure to present such a distinguished panel of speakers to you at the Science Faculty 50th Anniversary Symposium. We hope that today's event will serve to stimulate discussions and collaborations in scientific research, perhaps sparking innovations that would change the way we see the world. Thank you for being a part of our celebration of excellence in research.

Yours sincerely,

Henry N.C. Wong

Presentation Abstracts

and

Speaker Introductions

Professor Sun KWOK

Chair Professor of Physics and Dean of Science,
The University of Hong Kong

Professor Kwok's research areas are astrochemistry and stellar evolution. He is best known for his theory on the origin of planetary nebulae and the death of Sun-like stars. His recent research has been on the topic of the synthesis of complex organic compounds in the late stages of stellar evolution. He is the author of many books, including The Origin and Evolution of Planetary Nebulae (Cambridge, 2000), Cosmic Butterflies (Cambridge, 2001), Physics and Chemistry of the Interstellar Medium (University Science Books, 2007), Organic Matter in the Universe (Wiley, 2012), and Stardust: the cosmic seeds of life (Springer, 2013). He has been a guest observer on many space missions, including the Hubble Space Telescope and the Infrared Space Observatory. He currently serves as the President of Commission 34 interstellar Matter of the International Astronomical Union (IAU), as well as Vice President of IAU Commission 51 Bioastronomy. He served as the chairman of IAU Planetary Nebulae Working Group between 1994 and 2001, and as organizing committee member of IAU Astrochemistry Working Group.

Stardust: the Cosmic Seeds of Life

How did life originate on Earth? For over 50 years, scientists believed that life was the result of chemistry involving simple molecules such as methane and ammonia cooking in a primordial soup. Recent space observations have revealed that old stars are capable of making very complex organic compounds. The stars then ejected the organics and spread them all over the Milky Way Galaxy. There is evidence that these organic dust particles actually reached the early Solar System. Through bombardments by comets and asteroids, the early Earth inherited significant amounts of star dust. Was the development of life assisted by the arrival of these extraterrestrial materials? In this talk, we describe discoveries in astronomy and solar system science over the last 10 years that resulted in a new perspective on the origin of life.

References

Kwok, S. The Synthesis of Organic and Inorganic Compounds in Evolved Stars, ***Nature***, **430**, 985 (2004).

Kwok, S. and Zhang, Y. Mixed aromatic/aliphatic organic nanoparticles as carriers of unidentified infrared emission features, *Nature*, **479**, 80 (2011).

Professor Dennis Yuk-ming LO

Director of the Li Ka Shing Institute of Health Sciences,
Li Ka Shing Professor of Medicine,
Professor of Chemical Pathology, and
Associate Dean of Medicine (Research),
The Chinese University of Hong Kong

Professor Lo is the Director of the Li Ka Shing Institute of Health Sciences and the Chairman of the Department of Chemical Pathology of The Chinese University of Hong Kong. Professor Lo received his undergraduate education from the University of Cambridge and pursued his medical school education at the University of Oxford where he received the Doctor of Philosophy and Doctor of Medicine degrees. Since 1997, Professor Lo has been working on the biology and diagnostic application of cell-free DNA in human plasma. In particular, in the same year, Professor Lo and his co-workers reported the presence of cell-free fetal DNA in the plasma of pregnant women. Over the last 15 years, Professor Lo's team has brought non-invasive prenatal diagnosis from a research topic into clinical reality. Concurrent to his work on prenatal testing, Professor Lo has also explored the use of circulating DNA for the testing of cancer and has developed highly sensitive and specific assays for the detection of cancers common in Asia, including nasopharyngeal cancer. In recognition of his work, Professor Lo has won numerous awards and was elected as a Fellow of the Royal Society, the world's oldest scientific academy in continuous existence, in 2011.

Circulating DNA in Plasma in Health and Disease

There has been much recent interest in the biology and diagnostic applications of cell-free DNA in the blood circulation. In 1997, my team has discovered that during pregnancy, a fetus would release its DNA into the plasma of its pregnant mother. Over the last 15 years, developments in this area have transformed the landscape of prenatal testing. In particular, the non-invasive prenatal testing for sex-linked diseases, maternal-fetal blood group incompatibility and Down syndrome has become a clinical reality and is being performed in many centres around the world. Similarly, a tumour growing inside a cancer patient also releases its DNA into the bloodstream of the patient and can be used for cancer screening, prognostication and monitoring. My team has focused on the use of this approach for the non-invasive detection of cancers common in Asia, in particular, nasopharyngeal cancer and liver cancer. Excitingly, recent data suggest that the tumour genome can be deduced through the use of deep sequencing of plasma DNA from a cancer patient. Such developments are expected to greatly our ability to detect cancer early and to optimize the treatment of this deadly disease.

Professor Thomas Chung-wai Mak

Professor Emeritus of Chemistry,
The Chinese University of Hong Kong

Professor Mak received his secondary and university education, respectively, at Wah Yan College, Hong Kong and The University of British Columbia, Canada. He joined The Chinese University of Hong Kong as Lecturer in Chemistry in 1969 and is now Wei Lun Research Professor and Professor Emeritus. He was elected as a Member of Chinese Academy of Sciences in 2001.

His research interests cover Inorganic Synthesis, Coordination Networks and Supramolecular Assembly. His name appears in the list of "Highly Cited Researchers"; see http://highlycited.com/categories/chemistry/.

Academic Life at CUHK: Episodes and Reminiscence

This informal talk is dedicated to the memory of two departed mentors: Dr. Daniel Y. Chang 張儀尊先生 (1906-1982) and Dr. Hson-Mou Chang 張雄謀先生 (1923-2000), who had made lasting contributions to the early development of the Department of Chemistry at The Chinese University of Hong Kong. The first part covers episodes of my encounter and warm friendship with them. In the second part, I shall give some examples of my personal experience of the synergic integration of teaching and research over four decades.

卓越研究

Excellence in Research

The Faculty of Science is proud to be the home of more than a hundred dedicated scientists conducting cutting-edge research in various areas of science. Our staff and students remain committed to our Faculty's Mission in expanding the frontiers of human knowledge, aiming to build a better world for the future.

理學院擁有一支充滿熱誠的科研隊伍，逾百名科學家在多個領域進行尖端研究。我們的教職員與學生將秉承一貫的宗旨，擴展人類知識領域，爲未來建立一個更美好的世界。