

## A Joint HKSTAM/PolyU ME Distinguished Seminar

### Fuel Options for Next Generation Chemical Propulsion

*Prof. Chung K. Law*

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**Date:** 11 April 2017 (Tuesday)

**Time:** 10:15 am – 12:00 nn

**Venue:** Senate Room M1603, Hung Hom Campus, The Hong Kong Polytechnic University

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#### ABSTRACT

The state of research on developing fuel options for next generation chemical propulsion is discussed for aviation fuels and energetic fuels. For aviation fuels, the development is based on considerations of cost, energy security and climate change, with Fischer-Tropsch synthetic fuels and biofuels hold potential as alternative aviation fuels. The need for basic research to develop predictive capability for the oxidative chemistry of evolving fuels in evolving engine designs is emphasized, illustrated by the intricate reaction pathways and the enormity of the reaction mechanisms involved. Recent research activities towards achieving the goal of fuel design are discussed through the development of detailed mechanisms, reduced mechanisms, and surrogate fuels. For the development of high-energy-density propellants, advances in several classes of materials are discussed, including metallized and hypergolic propellants, and propellants with strained and functionalized molecules as well as nanoparticle addition. The impact of the recent progress in chemical synthesis, materials science and nano science on these advances is noted.

#### Biography of Speaker

Chung K. Law received his Ph.D. in Engineering Physics from the University of California at San Diego in 1973, and currently is the Robert H. Goddard Professor of Mechanical and Aerospace Engineering at Princeton University and the director of the Center for Combustion Research at Tsinghua University. His research interests cover various physical and chemical aspects of fundamental combustion phenomena, with applications to propulsion, energy, fuels and the environment. As of 2016 he has published over 475 journal articles, with over 10,000 SCI citations by others and an SCI h-index of 60. For his research accomplishments he has been honored with a number of professional awards, and an honorary Doctor of Engineering from the Hong Kong Polytechnic University in 2012. He is a fellow of the American Institute of Aeronautics and Astronautics (AIAA), the American Society of Mechanical Engineers (ASME), the American Physical Society (APS), the American Academy of Arts and Sciences (AAAS), and the American Association for the Advancement of Science (AAAS), a member of the US National Academy of Engineering (NAE), and a past president of the Combustion Institute.

This seminar is jointly organized by The Hong Kong Society of Theoretical and Applied Mechanics and Department of Mechanical Engineering, The Hong Kong Polytechnic University

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===== All are welcome =====

## Map of the venue

Senate Room M1603 is located at 16<sup>th</sup> Floor of Li Ka Shing Tower, The Hong Kong Polytechnic University.  
Map of the venue is shown below:

