

Department of Mechanical Engineering

Seminar Series

Combustion of Nanoparticles - from Soot to Energetics

Dr. John Wen

Associate Professor

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Department of Mechanical & Mechatronics Engineering
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Date	13 December, 2018 (Thursday)
Time	10:30am - 11:30am
Venue	B6619 (MNE Conference Room), Yeung Kin Man Academic Building

Abstract

Over years combustion has been explored, investigated and addressed as a primary approach to fuel the development of modern industry and humanity. Phenomena associated with combustion has, however, not been fully understood, which hinders mastering of combustion related technologies for a cleaner energy use. Some examples include nation-wide smog and haze problems in China and global warming. Meanwhile, combustion properties of nanoparticles such as aluminum and nanocomposites such as Metastable Intermolecular Composites (MIC) leads to research and development of novel power and heating technologies especially for microelectronics devices. In this talk, Dr. Wen will summarize some recent developments of a variety of emerging technologies by his research group at Waterloo. The following two topics will be presented:

- 1) Soot formation and its catalytic combustion; and
- 2) Combustion properties of aluminum nanoparticles and layered and nano-laminated MIC.

About the Speaker

Dr. John Wen is currently the director of the Laboratory for Emerging Energy Research (LEER) at the University of Waterloo, Canada. He graduated from Department of Mechanical & Industry Engineering at the University of Toronto (MAsc & Ph.D.) and spent more than two years as a Post-doctoral Fellow at Chemical Engineering of MIT. At MIT, he worked with the Green group (Prof. Bill Green at ChemEng) and Prof. Vander Sande's group (at Material Science and Engineering) for developing combustion based methods to produce carbon nanotubes. He was previously a visiting Post-doctoral researcher at the CoMo (Computational Modelling) group of University of Cambridge. And most recently he was a visiting professor at the Institut de Combustion Aérothermique Réactivité et Environnement, CNRS.

At the University of Waterloo, Dr. Wen is affiliated to WIN (Waterloo Institute for Nanotechnology), WISE (Waterloo Institute for Sustainable Energy) and Tsinghua-Waterloo Joint Research Centre for Micro/Nano Energy and Environmental Technology. He currently leads a research program dedicated to development of advanced energy, environment and manufacturing technologies using experimental means, materials with new compositions and properties and computer modeling. Some examples include, cost-effective CO₂ capture and sequestration (CCS) technologies, energy storage technologies through fabricating nanostructured electrodes, novel nanomaterials for developing advanced propellants and micro-propulsion technologies, and nano-catalyst based catalytic combustion technologies for cleaner natural gas, fossil fuel and biofuel combustion.

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All are Welcome!