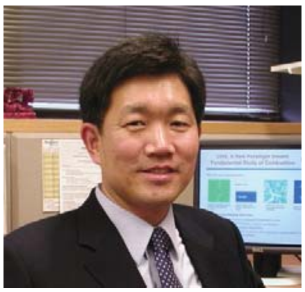
2011-2012

Graduate Seminar

The Department of Mechanical Engineering – Engineering Mechanics

Proudly Presents

Professor Hong G. Im
Department of Mechanical Engineering
University of Michigan



Professor Hong G. Im received his B.S. in Mechanical Engineering from Seoul National University in 1986, M.S. in Mechanical Engineering from Seoul National University in 1988, and M.A. and Ph.D. in Mechanical and Aerospace Engineering from Princeton University in 1991 and 1994, respectively. After graduation, he spent two years as a Research Fellow at the Center for Turbulence Research, Stanford University, followed by a post-doctoral tenure at the Combustion Research Facility, Sandia National Laboratories from 1996 to 1999. He joined the University of Michigan in January 2000 in the Department of Mechanical Engineering, where he currently holds a Professor position.

Hong Im's research and teaching interests are primarily fundamental and practical aspects of combustion and power generation devices using high-fidelity computational modeling. Recent research topics include modeling of combustion in low temperature combustion engines, advanced models for turbulent sooting flames, and combustion characteristics of high hydrogen content fuels for advanced gas turbine applications. He is a recipient of the NSF CAREER Award in 2002 and SAE Ralph R. Teetor Educational Award in 2006. He is an Associate Fellow of American Institute of Aeronautics and Astronautics (AIAA), and serves as an Associate Editor for the Proceedings of the Combustion Institute.

Thursday, Mar. 29, 2012 4:00 – 5:00 p.m. Room 112, ME-EM Bldg.

Understanding Auto-Ignition and Combustion Characteristics through High-Fidelity Simulation

Recent advances in the massively parallel computing technology have enabled first principle simulations of laminar and turbulent reacting flows to unravel fine-scale physics with ultimate realism and accuracy. To achieve this mission successfully, however, it is essential to develop reliable algorithms that are free from turbulence modeling errors and numerical dissipation. Furthermore, the implemented submodels should be able to describe the essential physical and chemical processes, such as radiative heat transfer, spray dynamics, and soot formation. This presentation will provide an overview of recent research activities using direct numerical simulations (DNS) with detailed chemistry and transport. In particular, DNS of auto-ignition in the presence of mixture stratification is analyzed to provide insights into the characterization of auto-ignition regimes and as a means to develop improved mixing models for turbulent combustion simulations.

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