DEPARTMENT OF MECHANICAL ENGINEERING
Purdue School of Engineering and Technology

SPRING 2004 SEMINAR SERIES

Date: Thursday, February 19, 2004
Time: 11:00 am - 12:00 pm
Room: ET 137

Reception at 10:45 am (cookies and refreshments served)
Everyone is invited

Flame extinction & reignition in turbulent reacting flows and how we're modeling it

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Abstract. The study of flame extinction and reignition processes in turbulent reacting flows is currently an active topic of research. This is because such processes play an important role in flame stabilization in many modern engineering combustion systems, but are not well described by the state-of-the-art modeling tools of combustion engineering. In my seminar, I describe why local extinction and reignition modeling is not amenable to traditional, deterministic moment methods and why we have turned to stochastic modeling ideas to improve upon the state-of-the-art. I also describe some of our other, new applications of existing stochastic modeling ideas which extend the state-of-the-art modeling capabilities and/or computational turn-around of the approaches for describing other important, coupled micro-physical phenomena observed in practical reacting flow systems.

For my talk, some background in turbulence is assumed. I review the state-of-the-art in turbulent combustion modeling. Those studying general multi-scale, non-linear/non-conservative systems may find a new application in turbulent reacting flows, or just enjoy some of my nice animations!

About the Speaker. Dr. Cha received his Ph.D. in Mechanical Engineering from the University of Washington, Seattle, in 2000. For his doctoral studies, he did modeling and computational work on reburning, an advanced NOx pollution reduction strategy for industrial furnace applications.

As a postdoctoral fellow at Stanford University from 2000-2002, he continued research in turbulent combustion modeling and computation but for gas turbine applications. In 2002, he joined Aerodyne Research, Inc. near Boston as a senior research scientist. There, in a joint project with MIT, he studied the trace species chemistry involved in contrail formation. Chong recently joined Rolls-Royce Corporation in Sept 2003 as a specialist in combustion methods. He has a number of refereed publications and conference papers in the above-mentioned areas.