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**SEMINAR NOTICE**

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***“Detailed Kinetic Modeling of Transportation Fuels”***

**Dr. Marco Mehl**  
***Chemical Sciences Division (CSD)***  
***Lawrence Livermore National Laboratory***

**ABSTRACT**

The increasing strictness of environmental regulations, including carbon emissions, and the rise in fuel prices are firmly driving the transportation scenario towards more efficient and cleaner combustion solutions, as well toward increased use of transportation fuels produced from renewable energy resources. Nowadays, the development of the necessary new technologies is supported by unprecedented modeling and diagnostic capabilities, allowing a significant reduction in prototype development costs. The ability of modeling the physical and chemical phenomena conditioning the combustion behavior of different fuels represents indeed a valuable tool to investigate fundamental aspects and composition effects on powertrain operations and emissions.

After a general overview of the development of combustion science, some of the continuing challenges in the study of the combustion kinetics will be presented. The fundamentals aspects related to the autoignition and combustion modeling of some relevant classes of fuels will be introduced. In particular, the relation between structural features and the combustion properties of different hydrocarbons will be discussed, covering some of the most relevant components of fossil and bio fuel surrogates.

Finally, future developments and research activities will be presented.

**BIOGRAPHY**

Marco Mehl received his PhD from Politecnico di Milano - Italy - in May 2007 under the guidance of Prof. Eliseo Ranzi. His thesis research was devoted to the study of autoignition processes occurring in internal combustion engines, integrating detailed kinetic modeling of fuel surrogates with 1-D/0-D fluid dynamic simulations of powertrains. Prof. Eliseo Ranzi's group (<http://www.chem.polimi.it/~ciic/psc/erpage.htm>) in Chemical Engineering at Politecnico di Milano, Italy is renowned for its contributions to the development of numerical/kinetic models for hydrocarbon reactions and their application to advancing energy conversion and chemical processing.

Dr. Mehl is presently a member (since February 2008) of the Combustion Chemistry ([https://www-pls.llnl.gov/?url=science\\_and\\_technology-chemistry-combustion](https://www-pls.llnl.gov/?url=science_and_technology-chemistry-combustion)) group led by Dr. William Pitz (formerly headed by Dr. C.K. Westbrook, retired) in the Physical and Life Sciences Directorate (Chemistry Sciences Division of Lawrence Livermore National Laboratories in Livermore CA. His work is continuing to contribute to the advancement of detailed chemical kinetic models for the combustion of higher hydrocarbons that impact improving transportation energy conversion efficiency and emissions using both petroleum derived and alternative liquid fuels.

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***Friday, October 9, 2009***  
***3:30 PM***

***Room 222***  
***Bowen Hall***

***ALL VISITORS ARE WELCOME!***

For inquiries, please contact the Dept. of Mechanical & Aerospace Engineering at 609-258-4741

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*Social Period in atrium outside of Bowen 222 following the seminar.*