LHD 国际学术报告会(主楼 312 会议室 2012 年 6 月 1 日周五上午 9 点)

报告题目：

Study of Propulsion Systems Using Advanced Laser Diagnostics

演讲人：

马林(副教授)
(美国 Virginia Tech
弗吉尼亚理工大学航空航海系)

时间：2012 年 6 月 1 日（周五）上午 9:00

地点：力学所主楼 312 会议室

邀请人：张新宇(研究员)

报告摘要：

The study of modern propulsion systems calls for innovative and effective experimental methods. This talk describes our efforts to develop such methods and apply them to study modern propulsion devices. A suite of advanced laser diagnostics has been developed to address the experimental challenges posed by modern propulsion systems, including the extreme temperature and pressure, highly transient physiochemical processes, control and stability issues, and multi-phase environment. This talk focuses on three topics to illustrate the unique opportunities enabled by these diagnostics for propulsion research: 1) the study of the control and stability of propulsion devices using absorption spectroscopy, 2) the study of dense fuel sprays using ballistic imaging, and 3) the study of fundamental turbulent combustion using particle image velocimetry and photodissociation spectroscopy. The applications of these topics in other cross-disciplinary areas will also be discussed.

报人简介：

马林，博士，2000 年在清华大学热能工程系本科，2001 和 2006 年在斯坦福大学机械工程完成硕士和博士学位。现任美国 Virginia Tech (弗吉尼亚理工大学)航空航海系以及机械工程系双聘副教授，美国航空航天学会高级会员；美国光学学会和国际汽车工业学会会员。2009 年获得美国国家科学基金杰出青年奖 (CAREER award 2009)。学术成果包括 36 篇高影响因子的国际期刊论文(SCI 影响因子 1.6~3.8)，37 篇国际会议论文，书著一章，美国专利一项。研究成果数次被媒体报导，包括 US News and World Report 的报导。总体研究方向集中于

能源和污染问题，专长于开发先进的光学检测技术来研究能源和污染的复杂问题。目前已经成型的具体研究方向包括燃烧污染物的检测，内燃机纳米污染物的检测，纳米颗粒的反应动力学，航空推进系统。

Dr. Ma received his B.S. in thermal engineering at Tsinghua University in 2000. He earned his M.S. and Ph.D. in mechanical engineering at Stanford University in 2001 and 2006, respectively. He is currently an Associate Professor of Aerospace and Ocean Engineering, and also Mechanical Engineering (Affiliate) at Virginia Tech. His research focuses on the study of propulsion and energy systems, with a special strength in the development and application of advanced optical diagnostics. Other representative projects include the study of aerospace propulsion devices, fuel spray physics and chemistry, and nano-scale energetic materials.

He is a senior member of the American Institute of Aeronautics and Astronautics, and a member of the Optical Society of America and Society of Automotive Engineers. He is a 2009 recipient of a National Science Foundation CAREER award to study turbulence-chemistry interactions. His academic achievements include 37 refereed journal paper, 37 conference papers, one book chapter, and one patent application. His research has received considerable media exposure, including a recent report by US News and World Report (http://www.usnews.com/science/articles/2012/04/24/unsolved-physics-question).

Dr. Ma's expertise in laser diagnostics brings a unique capability to the department and the Commonwealth Center for Aerospace Propulsion Systems. His expertise is expected to provide test data for the validation of combustion models, a critical aspect in the development of modern propulsion systems. Such validated models are solely needed to reduce the cost and accelerate the development cycle of new propulsion systems.