# 美国普林斯顿大学C. A. Floudas教授
# 特邀学术报告

**时 间：** 2010年5月12日（周三），下午 14:30 - 16:00

**地 点：** 过程大厦 312 会议室

**题 目：** Hybrid Biomass, Coal, and Natural Gas Processes: Modeling, Simulation, and Economic Analysis

**摘 要：**

Liquid hydrocarbon fuels represent the primary energy sources towards addressing the transportation needs of the United States. Even though the availability and economic incentives of petroleum-based fuels have been unchallenged for many decades, recent variability in oil prices and concerns about declining world oil production and industrial growth of developing nations manifest a pressing need to investigate and develop alternative energy sources and processes which will address greenhouse gases emissions issues in tandem.

In this seminar, we will focus on recent process systems engineering advances that aim at hybrid energy processes that combine biomass, coal, and natural gas towards meeting the US transportation sector needs. The first part will present an overview of the needs and introduce novel process alternative flowsheets that aim at near zero $CO_2$ emissions. The second part will address the mathematical modeling of important units such as biomass and coal gasifiers, as well as a parameter estimation framework for the prediction of non-equilibrium effluent conditions. The third part will introduce a new approach for the simultaneous heat and power integration that accounts for heat engines that produce electricity, and exhibit minimum utility use. The fourth part will present the steady state simulation results of seven process alternatives coupled with a detailed economic analysis that reveals the trade-offs, the break-even oil price, and the sensitivity to the hydrogen and electricity prices.

## 报告人简介：

**C. A. Floudas教授：** 普林斯顿大学工程院Stephen C. Macaleer 63教授、化学工程系教授、AIChE科学技术应用分部主任、普林斯顿计算机辅助系统实验室主任、生物工程中心兼职教授、应用与计算数学系兼职教 运 筹与金融工程系兼职教授。

**研究领域与方向：** 在过程科学与工程(Process Science and Engineering)领域开展离散连续的非线性优化(Discrete-Continuous Nonlinear Optimization)、确定性全局优化(Deterministic Global Optimization)、过程工艺合成与设计(Process design, Synthesis and Discovery)、过程操作的计划和调度(Process Operations: Planning and Scheduling)、计算机化学和分子生物学(Bioinformatics and Computational Genomics)的研究。

**学术任职及研究情况：** 担任《Industrial Engineering Chemistry Research》、《Journal of Global Optimization》、《Journal of Industrial Management and Optimization》等学术刊物编委等职务。独撰《非线性与混合整型优化》和《确定性全局优化》两部研究生教材；作为主要编写人员，合著《优化百科全书》等书籍12部，章节4部；发表论文309篇，他引5000余次，自有专利6个，特邀报告和主持研讨会等466余次。

**获奖情况：** 1986年以全美优秀论文于Carnegie Mellon University博士毕业。先后获得University of Minnesota的George T. Piercy 杰出客座教授、Carnegie Mellon University的Bayer杰出演讲者、Imperial College第十五个Roger W.H. Sargent特邀讲座教授等荣誉；此外还于1988年获美国国家科学基金会杰出青年科学家总统奖(NSF Presidential Young Investigator Award)；1997年获应用科学领域Bodossaki基金会奖；1998年获《计算机与化学工程》(Computers and Chemical Engineering)杂志的年度最佳论文奖；1999年获Aspen Tech杰出教学奖；2001年度获美国化学工程师协会（AIChE）职业成就奖(Professional Progress Award)(该奖项每年度仅嘉奖一人)；2006年获美国化学工程师协会(AIChE)化学工程计算奖。

**备注：** 了解更多信息可登陆C. A. Floudas教授的主页：http://titan.princeton.edu