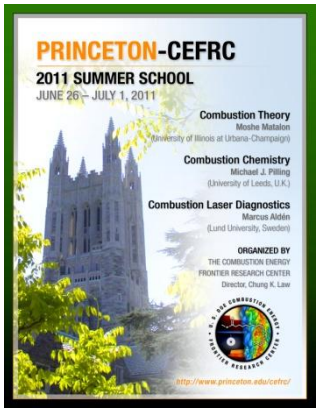

Our Mission

To provide the next generation of combustion researchers with a comprehensive knowledge in the technical areas of combustion theory, experiment, computation, fundamentals, and applications.

The 2011 Session

The 2011 session, scheduled for **June 26 to July 1, 2011,** will offer three courses: (1) Combustion Theory, to be delivered by **Professor Moshe Matalon** of the University of Illinois at Urbana-Champaign, (2) Combustion Chemistry, to be delivered by **Professor Michael J. Pilling** of the University of Leeds, UK, and (3) Combustion Laser Diagnostics, to be delivered by **Professor Marcus Aldén** of Lund University, Sweden.

Program Dates

Arrival & Welcome Reception:

The summer school will begin with an orientation and welcome reception on Sunday, June 26, 2011 at 5:30pm. Staff will be available prior to the reception for check in to dormitory rooms. Participants may also arrange for early arrival and check-in on Saturday, June 25, 2011.

Class Schedule: Classes will be held from Monday, June 27, 2011 through Friday, July 1, 2011.

Closing Dinner: The summer school will conclude with a dinner and wrap-up session on Friday evening, July 1.

Departure and Check Out: Dormitory check out is Saturday, July 2, 2011.

Application Materials

All applications are to be submitted online at www.princeton.edu/cefrc and received by March 11, 2011.

Acceptances will be communicated by April 1, 2011.

Course Description

Combustion Theory

Lecturer: Prof. Moshe Matalon
University of Illinois at Urbana-Champaign
Course Length: 15 hours

Objective: The aim of this course is to provide students with an understanding of the basic principles associated with combustion processes, how these concepts relate to experimental observations and how they can be used for theoretical and/or numerical modeling. The first four lectures cover the fundamental of chemically reacting flows, general conservation laws and classifications of various combustion processes. The remaining lectures focus on low-speed combustion, or flames. Four lectures are devoted to premixed combustion and include the structure of a premixed flame and the determination of the laminar flame speed, multi-step chemistry, hydrodynamics effects, ignition and extinction phenomena and combustion instabilities. The next four lectures are devoted to non-premixed combustion and include the structure of a diffusion flame, the mixture fraction formulation, the burning of condensed fuels, jet flames, flame lift-off and edge flames. The last three lectures will be on turbulent flames covering the different regimes of turbulent combustion, the various approaches used in modeling turbulent flames, the turbulent burning velocity, and the flamelet concept for nonpremixed flames.

Combustion Chemistry

Lecturer: Prof. Michael J. Pilling
University of Leeds, UK

Course length: 15 hours

Objective: The aim of this course is to provide students with an understanding of how rate coefficients and products of elementary reactions, of importance in combustion, are determined experimentally, how they are used in conjunction with theoretical models and how they are incorporated in chemical mechanisms for use in combustion models. Thermodynamic properties are also central to combustion and their determination for radical species will be discussed. The course will be illustrated by a number of detailed examples of relevance to high and low temperature hydrocarbon oxidation and NOx formation and control. The final lectures will examine the impact of combustion emissions, and especially of NOx, on climate change and air quality.

Combustion Laser Diagnostics

Lecturer: Prof. Marcus Alden
Lund University, Sweden

Course length: 12 hours

Objective: The aim of the course is to provide graduate students in combustion with a fundamental understanding of the use and application of laser techniques for diagnostics of combustion processes. The lectures will be concentrated on spectroscopic techniques for measurements of temperature, species concentration and particle characterization. The course will include fundamental issues on molecular spectroscopy and relevant instrumental equipment and will cover techniques based on linear optics, e.g. laser-induced fluorescence, Rayleigh and Raman scattering as well as techniques based on non-linear optics, e.g. CARS, polarization spectroscopy and DFWM. The techniques will be described in terms of relevant theory and exemplified by numerous applications, ranging from small scale laminar flames to full scale boilers.

Location & Accommodations

The Summer School will be held at Princeton University. On-campus lodging in single-person, air-conditioned dormitory rooms with same-gender shared bath facilities is available to all participants. Breakfast, lunch, dinner meal plans are available to all participants. Participants may also choose to make arrangements to stay and dine at area hotels and restaurants.

Expenses

Dormitory: $50 per night. Dorm arrangements are available 6/26-7/2, 2011.

Meals: Cost to be determined. Meal plans are available from 6/27-7/1, 2011.

Registration: $50 – Students, research and teaching staff of U.S. academic institutions and government agencies. $250 – All other participants.

Student Scholarships

All non-Princeton University students who are enrolled at U.S. academic institutions will receive scholarships sufficient to cover the expenses for up to 7 days of dormitory lodging from 6/26-7/2 and all meals from 6/27-7/1, 2011.

All Princeton University students will receive scholarships sufficient to cover the expenses for 5 days of lunch, from 6/27-7/1, 2011.

CEFRC
2011 Princeton-CEFRC
Summer School on Combustion

Further inquiries on the academic program or the logistics of participation can be made by contacting Professor Chung K. Law, director of the CEFRC, cklaw@princeton.edu, 609.258.5271 or Lilian Tsang, program administrator, ltsang@princeton.edu, 609.258.5041.

Visit us online at www.princeton.edu/cefrc