

Combustion Diagnostics and Mechanisms

Research focuses on the experimental investigation of combustion phenomena, from the fundamentals of chemistry to the physics of fluid flows. Several techniques are employed to identify and monitor relevant species, temperature, and flow fields: laser-induced fluorescence, near infrared (IR) tunable diode laser absorption, Raman, laser Doppler velocimetry, and particle image velocimetry (PIV). High-speed visible and infrared video cameras, FTIR spectrometers, and monochromators and CCD cameras are used for data collection and visualization. An integral part of these studies is computer modeling of the flame chemistry and flow fields. Available resources include an Nd:Yag-pumped dye laser system, near IR diode laser spectrometer, multipass Herriott cell, particle image velocimetry system, laser Doppler velocimetry system, counter-flow flame burner and flat-flame burner (for atmospheric or low-pressure operation), cup burner, various spectrometers and optical multichannel detectors, computer-assisted data acquisition systems, and workstations for computations and data presentation. See also <http://www.nrl.navy.mil/chemistry/research/6180/6185> on the World Wide Web.