CENTER FOR BEAM PHYSICS SPECIAL SEMINAR

# "Experimental Science at the Extremes: Laboratory Astrophysics on High Energy Density Facilities"

Bruce Remington, LLNL

Tuesday November 27, 2001, 2 PM
Albert Ghiorso Conference Room (71-264), LBNL
*** **please note special day/time** ***

Abstract: Lawrence Livermore National Laboratory modern laser facilities offer new opportunities for pursuing experimental science at the extremes. Compared to other areas of science, the field of high energy density physics, emerging as a result of high power lasers, is still in its infancy. Only a handful of lasers around the world are operated as user facilities, and yet in the short time that such capability has been available, a user community has nucleated, and new regimes of experimental science are emerging. I will review a selection of science highlights that serve to illustrate the potential of this new capability. Examples of experiments done to probe the dynamics of core-collapse supernovae, high Mach number jets relevant to protostellar outflows, the physics of the interiors of giant planets, relativistic plasma dynamics possibly relevant to gamma-ray bursts, and solid-state physics at extreme pressures and strain rates will be given.

Biographical information: Bruce Remington joined LLNL as a nuclear physicist after obtaining his Ph.D. in 1986 from Michigan State University in experimental nuclear physics. In 1988 he joined the laser program in nuclear diagnostics for ICF, becoming the Hydrodynamics Group Leader for this program in 1994. In 1995 he was named project leader for Laser-Astrophysics. He has received such awards as the Excellence in Plasma Physics award (APS/DPP, 1995), Fellow of the APS (1995), and APS-DPP Distinguished Lecturer (2000). In addition, he was chair of the APS/DPP Public Information Committee (1997), and chair of the APS Topical Group in Plasma Astrophysics (1999). This year he is a member of NAS-NRC Committee on High Energy Density Plasma Physics.