2011

20,000th Target Shot



20,000th Target Shot

In 2011, the 60-beam OMEGA laser conducted its 20,000 target shot (OMEGA S/N 64108 from port H8) since it was commissioned in 1995. The facility capabilities include flexible pulse shaping, beam smoothing, power balance, and comprehensive diagnostics. OMEGA is one of the world's most productive high-energy-density-physics facilities.

New Era of Plasma Nuclear Science Opens at the Omega Laser Facility



OMEGA Target Bay containing the charged-particle spectrometer used for differential cross-section measurements

LLE ushered in a new frontier of plasma nuclear science at the Omega Laser Facility by measuring a nuclear scattering cross section more precisely than ever determined before with particle accelerators. "This is the first time a high-energy-density laser facility has been used to advance the field of nuclear physics," said Dr. David Meyerhofer, LLE Deputy Director and Professor of Mechanical Engineering and Physics & Astronomy. A research team from the Massachusetts Institute of Technology, Lawrence Livermore National Laboratory (LLNL), and the University of Rochester worked on the project and published their findings in the 16 September 2011 Physical Review Letters.

J. A. Frenje et al., "Measurements of the Differential Cross Sections for the Elastic n-³H and n-²H Scattering at 14.1 MeV by Using an Inertial Confinement Fusion Facility," Phys. Rev. Lett. **107**, 122502 (2011).



UROSS camera shown inside the short-pulse diagnostic package in the OMEGA EP Laser Bay



2-ps-time-resolution P820 streak tube manufactured by Photonis (Brive, France)

The heart of the Ultrafast Rochester Optical Streak System (UROSS) cameras used by the Omega Laser Facility is the streak tube. The cameras are used to diagnose the pulse shape on the OMEGA EP short-pulse, 1- to 100-ps beamlines.

Laboratory for Laser Energetics

a unique national resource

Installation of the charged-particle spectrometer, July 1998

Magnetized ICF Targets



Four different coil shapes, ranging in size from 6 to 16 mm, superimposed on an image of a target shot

Various coil designs have been utilized in experiments with magnetized inertial confinement fusion (ICF) targets using the magneto-inertial fusion electrical discharge system (MIFEDS). Shown are four different coil shapes, ranging in size from 6 to 16 mm, superimposed on an image of a target shot (OMEGA S/N 59300) which utilized one of these coils. Inside the target chamber, the shot image measures about 0.9 m across.

30th Summer High School Research Program Participant Named Intel Semifinalist



In 2011 LLE's Summer Research Program for High School Juniors produced its 30th semifinalist in the Intel Science Talent Search since its inception in 1989. The Science Talent Search is often referred to as the "Junior Nobel Prize" and is the nation's oldest and most prestigious pre-college science competition.



