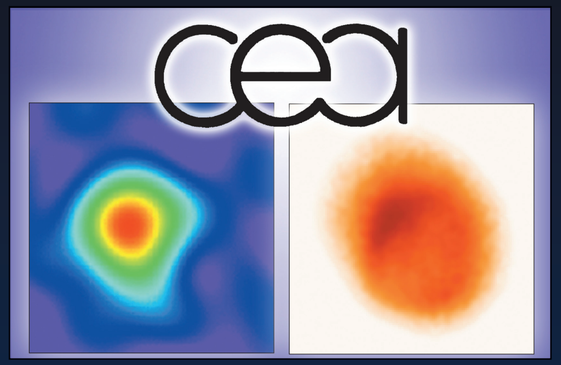
1999

LLE CEA Collaboration



Images from CEA collaboration

LLE began a long-standing collaboration with Commissariat à l'Énergie Atomique Division of Military Applications (the Military Applications Division of the French Atomic Energy Commission, CEA). Their collaboration has produced scientific results ranging from improved understanding of laser–plasma interaction, to high-resolution neutron imaging diagnostic development.

Cryogenic Target Handling System

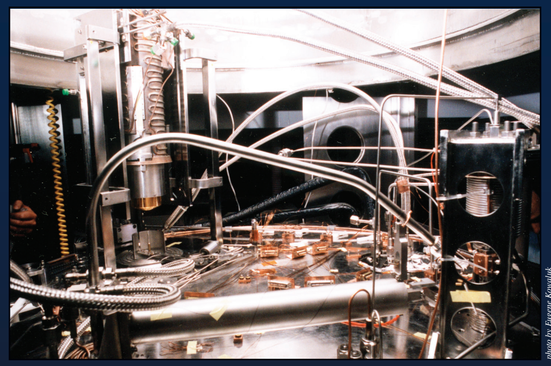
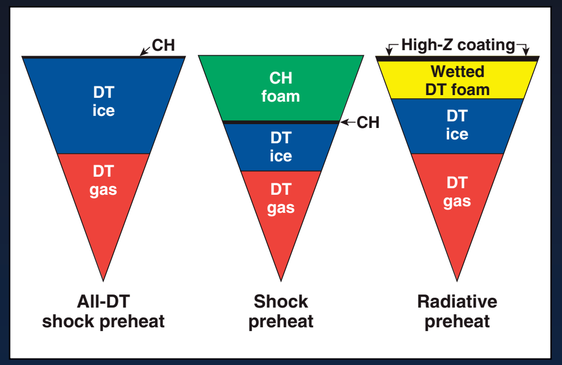


photo by Eugene Kowaluk

Permeation and target-transfer equipment inside the cryostat

LLE integrated the OMEGA Cryogenic Target Handling System into the OMEGA facility.

Target Designs for NIF



Direct-drive target designs for the NIF

LLE developed moderate-gain, direct-drive designs for the NIF.

Moving Cryostat

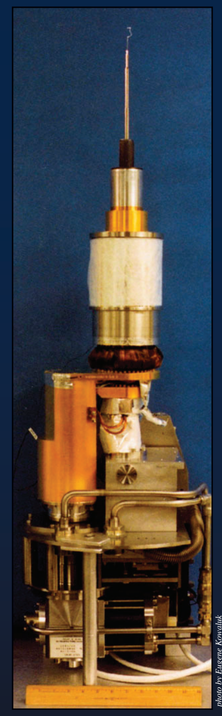


photo by Eugene Kowaluk

◀ *Photograph of moving cryostat base*

The moving cryostat maintains a target at a constant temperature to layer the DT ice and transports the target to the center of the target chamber. The cryostat base is shown. At the bottom is the cryo cooler. Above the cooler are the four-axis positioner and two thermal shrouds that are maintained at 45 K and 16 K. The target assembly is at the top. The target is mounted on spider-silk in a C-shaped beryllium support.

NIF Deformable Mirror

photo by Eugene Kowaluk

Hope D'Alessandro, electronics technician, prepares a NIF deformable mirror substrate for surface figure testing on LLE's 18-in.-aperture interferometer

The NIF deformable mirror will allow wavefront correction of the NIF beam when the 39 posts on the back of the mirror are bonded to actuators on a reaction block. LLE will be coating the substrates with a low-stress, dielectric high reflector and assembling the deformable mirrors for Lawrence Livermore National Laboratory (LLNL).

2-D Smoothing by SSD

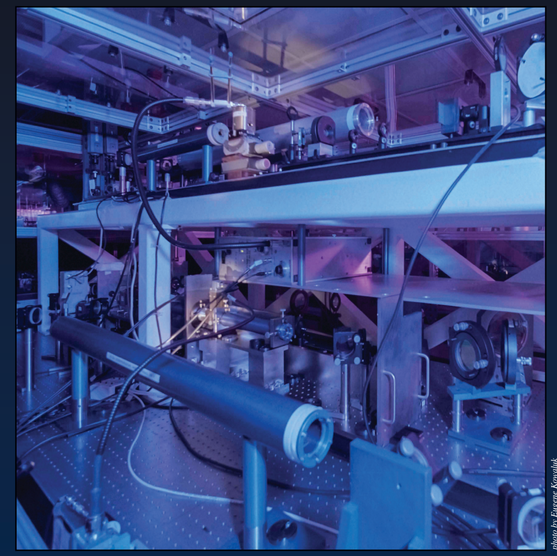


photo by Eugene Kowaluk

OMEGA 2-D SSD system

A two-dimensional smoothing by spectral dispersion (2-D SSD) system was installed on OMEGA and was capable of producing phase-modulated spectra that can be frequency tripled to 1-THz bandwidth in the ultraviolet. This 2-D SSD system incorporated a high-frequency bulk-phase modulator operating at 0.4 GHz to produce a 11 Å of bandwidth in the infrared.

Efficient frequency tripling of this broadband signal requires dual-tripler frequency-conversion crystals that are currently installed on only 13 beams. The high-frequency bulk-phase modulator can also be operated at 3 Å with a higher dispersion grating to produce three SSD color cycles, which significantly improves beam smoothing at lower bandwidths on all 60 OMEGA beams.