1986

Progress in Laser Fusion

August 1986 cover of Scientific American showing the diagnostics inside the OMEGA target chamber

In August 1986, the cover of Scientific American showed the diagnostics inside the OMEGA target chamber. The featured article was titled "Progress in Laser Fusion" by R. Stephen Craxton, Robert L. McCrory, and John M. Soures. The article discussed the considerable progress made in laser fusion since the ability to convert infrared lasers to the ultraviolet was demonstrated at LLE in 1979. The authors concluded that electric power generation using short-wavelength lasers would be feasible with lasers generating between 1.6 and 10 MJ per pulse with a fusion energy release 100× larger than the input laser energy.

R. S. Craxton, R. L. McCrory, and J. M. Soures, "Progress in Laser Fusion," Sci. Am. ***255,*** *268–279 (1986).*

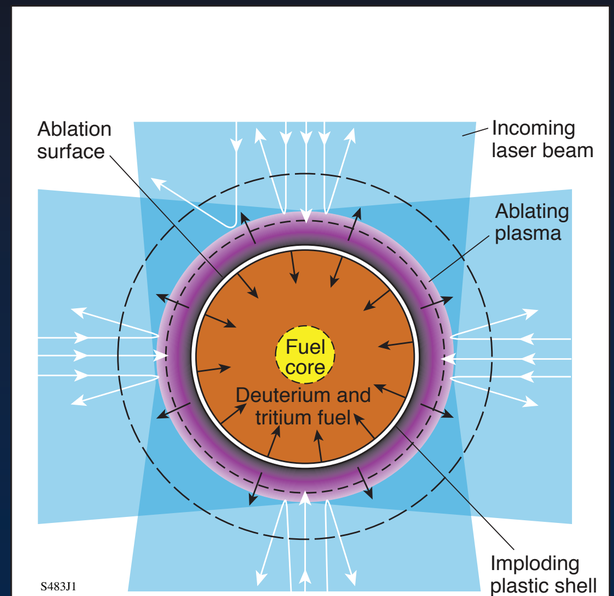

Figure from Scientific American article showing the process of laser fusion.

Review Recognizes LLE Research

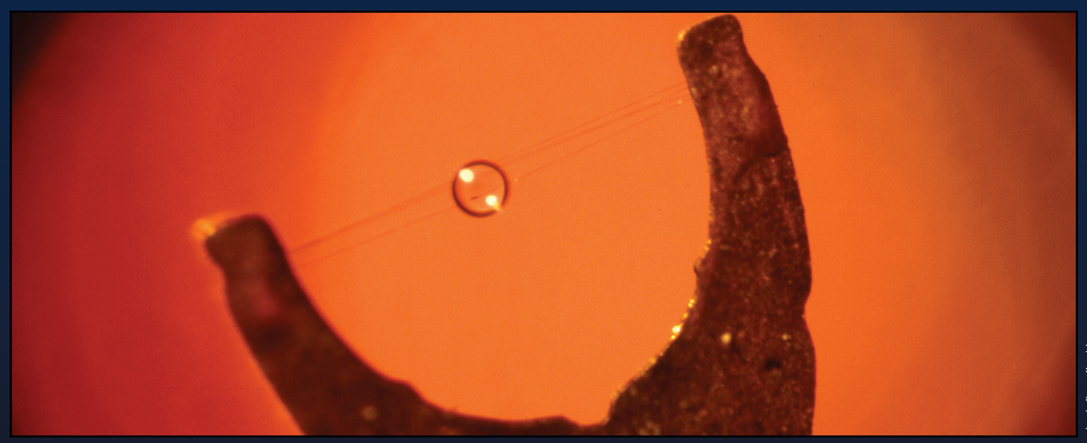

photo by Eugene Kowaluk

Horseshoe mount for 24-beam OMEGA cryogenic target

In March, 1986 the National Academy of Sciences Review of the Department of Energy's Inertial Confinement Fusion (ICF) Program recognized the important work being done by LLE in addressing the key aspects of ICF research. They set a goal of compressing a cryogenic direct-drive target to 100 to 200× liquid-DT density as a demonstration to justify the upgrade of the OMEGA laser to 30 kJ.

W. Happer, ed., in Review of the DOE's Inertial Confinement Fusion Program *(National Academy of Sciences Washington, DC 1986).*

1987

High-Density Compression

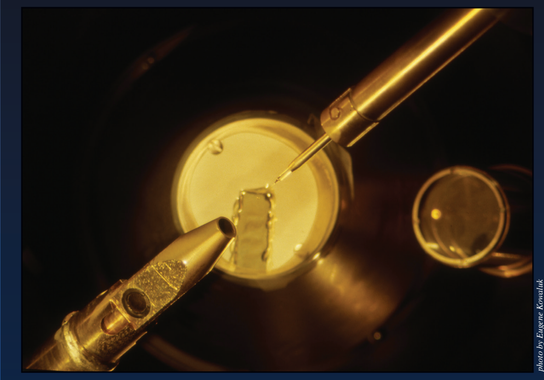

photo by Eugene Kowaluk

Cryogenic target shroud for 24-beam OMEGA

The first cryogenic target system was installed on the OMEGA chamber in support of achieving the Department of Energy (DOE) goal of compressing a cryogenic direct-drive target to a density of 100 to 200× liquid DT density. Many laser shots were taken during the summer and early fall before it was decided to suspend shots in order to carry out several system redesigns. Among the principal problems faced at that time were target vibration, unpredictable cryogenic shroud retraction, and poor DT-layer quality. The lessons learned on this first OMEGA cryogenic system helped in the future design of the much more challenging cryogenic system that was developed a decade later for LLE experiments.