

IN BRIEF

During the period from June through September, significant progress has been made in a number of areas. They include:

- the activation of the OMEGA uniform illumination implosion facility,
- diagnostic development for core density measurements in imploded targets,
- theoretical determination of the gains to be made in target performance by conversion of the driver wavelength to $0.3513\text{ }\mu\text{m}$,
- and new facility and instrumentation development in picosecond and subpicosecond research.

Highlights of these activities are:

- Initial alignment and focusing multi-beam target shots were conducted on the OMEGA system with the resulting x-ray pinhole camera images serving as the first target diagnostic for alignment and focusing accuracy. Pointing and focusing of all beams on target was well within the required specifications for the upcoming uniform implosion studies.
- Preliminary measurements of OMEGA beam propagation indicate that acceptable beam quality and focusing characteristics can be achieved at the target chamber.

- Numerical modeling of the impressed laser beam profiles at the absorption surface of the target has provided us with results that indicate uniformity in excess of 95% is achievable for spherical implosion experiments.
- X-ray spectroscopy of the compressed cores in the imploded targets has verified the higher predicted core densities with improved irradiation symmetry.
- Earlier estimates of improved target performance with a shorter wavelength laser driver have been refined by detailed calculations on the laser radiation absorption efficiency at $0.3513\text{ }\mu\text{m}$. These calculations support our earlier enthusiasm for higher target performance efficiency at shorter wavelength and provide the guidance for short wavelength interaction experiments to be carried out in the next quarter.
- The development, construction, and demonstration of a simple picosecond streak camera with subpicosecond jitter has been completed in this quarter.

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The cover photograph shows an engineer at the Laboratory for Laser Energetics aligning one of the injection mirrors in the OMEGA laser system. These mirrors direct the laser beams from the output of each beamline toward the final turning mirrors located in the target bay.