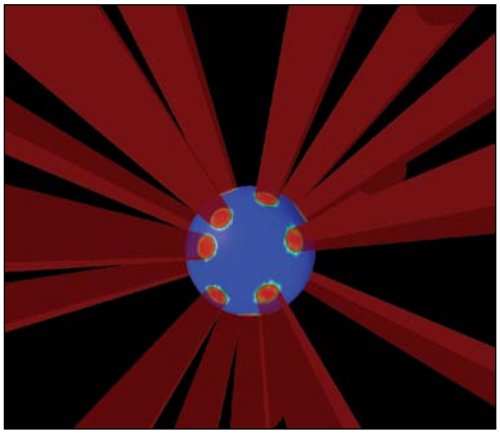
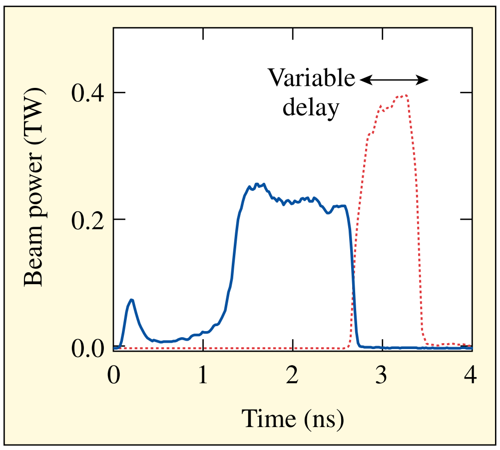
About the Cover:

The VISRAD simulation of a shock-ignition experiment seen on the cover of this review shows the placement of 20 OMEGA laser beams tightly focused on the critical surface of an imploding spherical target to launch an ignitor shock wave. In the shock-ignition concept for inertial confinement fusion, fuel assembly and ignition are separated. In the fuel-assembly step, targets are first imploded by lasers with a pulse designed to compress the target to a large areal-density core. In the ignition step, a strong shock wave is launched into the target using high-intensity laser light. This ignitor shock heats the hot spot and ignites the target. The final result is ignition with a lower energy threshold or significantly larger gains for the same laser energy than the conventional direct-drive-ignition concept.





For the experiments described in the feature article (see **Shock-Ignition Experiments on OMEGA at NIF-Relevant Intensities**, p. 117), the ignitor spike beams were tightly focused on the compressed core to achieve intensities of up to 1×10^{16} W/cm^2 to drive a strong shock. Good coupling of the shock-beam energy was observed in these experiments, leading up to an ~20× increase in neutron yield. The intense ignitor beams were also observed to produce fast electrons via laser–plasma interaction, which, due to their short mean free path, should be stopped in the target shell, further augmenting the ignitor shock. The enhanced neutron yields and beneficial effect of fast electrons are very encouraging for the shock-ignition concept and research into it continues at LLE.

The drive for these shock-ignition experiments was provided by 40 OMEGA laser beams using the low-adiabat ($\alpha \sim 1.5$) shaped pulse (solid line) with an ~100-ps picket preceding a shaped main-drive portion, which consisted of a low-power foot and a moderate-power plateau with a total duration of 2.6 ns. The delayed 20 ignitor beams used an ~600-ps FWHM square pulse shape (dashed curve) and were tightly focused on the shell without polarization smoothing or phase plates to maximize intensity.

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