About the Cover:

Senior Scientist Sean Regan (left) and graduate student Hiroshi Sawada (right) (of the Department of Mechanical Engineering) analyze an x-ray absorption spectrum measured on the OMEGA Laser System. The time-resolved spectrum was recorded on film using an x-ray streak camera outfitted with a Bragg crystal spectrometer. A digital image of the absorption spectrum is projected in the background. An investigation of thermal transport in direct-drive targets is the main subject of Mr. Sawada's Ph.D. thesis research. The shock-heating and heat-front penetration resulting from the laser-ablation process are examined spectroscopically using a point-source x-ray backlighter. When the shock, and subsequently the heat front, reach the buried Al tracer layer in a planar plastic target, the Al is ionized and a time history of the electron temperature is inferred from the Al absorption spectral features. Experimental results of shock heating for direct-drive targets along with laser-absorption and mass-ablation-rate measurements are compared with simulations of the one-dimensional hydrodynamics code *LILAC* (see "Laser Absorption, Mass Ablation Rate, and Shock Heating in Direct-Drive Inertial Confinement Fusion," p. 1).

In preparation for a shot day on the OMEGA Laser System, Senior Scientist Sean Regan (principal investigator) presents the experimental objectives of the shock-heating campaign to the watchstanders at the 0800 Pre-Watch Briefing. Watchstanders are responsible for different aspects of the laser operation, including experimental operations, laser drivers, beamline operations, power conditioning, and amplifiers. Thirty watchstanders are needed for a 12-h shot day on OMEGA, which requires pre-watch system-startup activities beginning at 0400.

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For questions or comments, contact Igor Igumenshchev, Editor, Laboratory for Laser Energetics, 250 East River Road, Rochester, NY 14623-1299, (585) 275-4792.

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