# IN BRIEF

This volume of LLE Review contains articles on the initial phase of the infrared-to-ultraviolet conversion of OMEGA, experimental and theoretical advances in the laser-fusion effort, improved target fabrication capabilities, developments in the picosecond optics area of the LLE advanced technology program, and on the National Laser Users Facility activity.

The following are some highlights of the work described in this issue:

- The OMEGA frequency-conversion effort achieved a major milestone during this quarter with the activation of six 351-nm-wavelength beams. In the first series of test shots, the system produced up to 305 J of energy at 351 nm, thus surpassing GDL as the most powerful 351-nm laser currently operating.
- The classical theory of thermal heat transport has been extended to include the effects of steep temperature gradients in the presence of strong magnetic fields. Magnetic fields an order of magnitude smaller than those typically observed could have a strong limiting effect on thermal heat conduction.
- By applying an improved statistical ray tracing theory to the propagation of light beams in plasmas with random density fluctuations, it is possible to describe some of the effects of density fluctuations on illumination uniformity and energy absorp-

tion efficiency in terms of the statistical properties of the density fluctuations.

- The automation of the ablation-layer coating process has significantly improved the target fabrication capability at LLE by removing the need for an operator to devote close and prolonged attention to each target being coated and by permitting much more precise layer-thickness control. Another significant advance has been the improvements in the drill, fill, and plug technique pioneered at LLE, which now allow sealing targets with plugs having masses at least two orders of magnitude smaller than the plugs used previously.
- Experiments in the LLE picosecond biophysics facility analyze the energy transitions and deformations of biomolecules by observing their fluorescent responses on very short time scales.
- A new technique developed at LLE allows finely resolved temporal sampling of an electrical signal by using electron pulses to probe the signal field directly. With this approach, signals need not be passed through electro-optic crystals; this gives the new method the advantage of access to signals in free space.

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*Robert Peck (left) and Robert Hutchison, engineers in the Experimental Implementation Group, examine a scale model of the OMEGA system as it would be reconfigured for a full 24-beam ultraviolet conversion. The successful activation of the first six ultraviolet beams during this quarter was a major milestone in the laser-fusion effort at LLE.*