IN BRIEF

This volume of the LLE Review, covering the period July–September 1989, is concerned primarily with uniformity studies. The first article is a report on a series of target experiments with improved irradiation uniformity in which major increases in neutron yields were produced. The first of two articles on theoretical developments presents a new interpretation of burn-through experiments, continuing a study reported in LLE Review 35. The second theoretical article suggests a change in distributed phase-plate design that can improve beam uniformity over that achieved with random-pattern plates. The fourth and fifth articles report that uniformity in the deposition of DT layers in microballoons at very low temperatures has been achieved by a temperature-gradient technique, and that aberration-free interferograms are now being obtained in the target chamber. Finally, the activities of the National Laser Users Facility and the GDL and OMEGA laser facilities are summarized.

Highlights of the research reported in this issue are

- In a recent series of gas-filled implosion experiments greatly improved neutron yields have been obtained as a result of recent improvements in irradiation uniformity. The observed yields came closer to one-dimensional calculated yields.
- The dependence of burn-through time on the nature of barrier layers has been unexplained despite analysis in terms of hot spots, prepulses, shine-through, filamentation, and self-focusing. It is now reported that the anomalous barrier-layer dependence is potentially

understandable in terms of the Rayleigh-Taylor instability, which may mix signature-layer material with the parylene coating.

- Randomly distributed elements may not be the optimum pattern for improving illumination uniformity by distributed phase plates (DPP's). It has been shown in theory that useful improvement in uniformity could result from the reduction of spatial correlations between elements.
- Using a thermal-gradient technique, uniformity of DT target fuel layers has been produced in a transient state. This development is a major step toward the deployment of targets at low temperatures without a beam-blocking cryogenic shroud. Uniformity is achieved in targets at higher pressures than possible with the instant-refreeze technique currently in use.
- With a newly developed achromatic shearing interferometer, aberration-free target interferograms can be made. Two of the new interferometers have been implemented on the OMEGA target chamber to provide orthogonal views. They are remotely controlled for focus, shadowgram shuttering, and tilt and phase adjustment.

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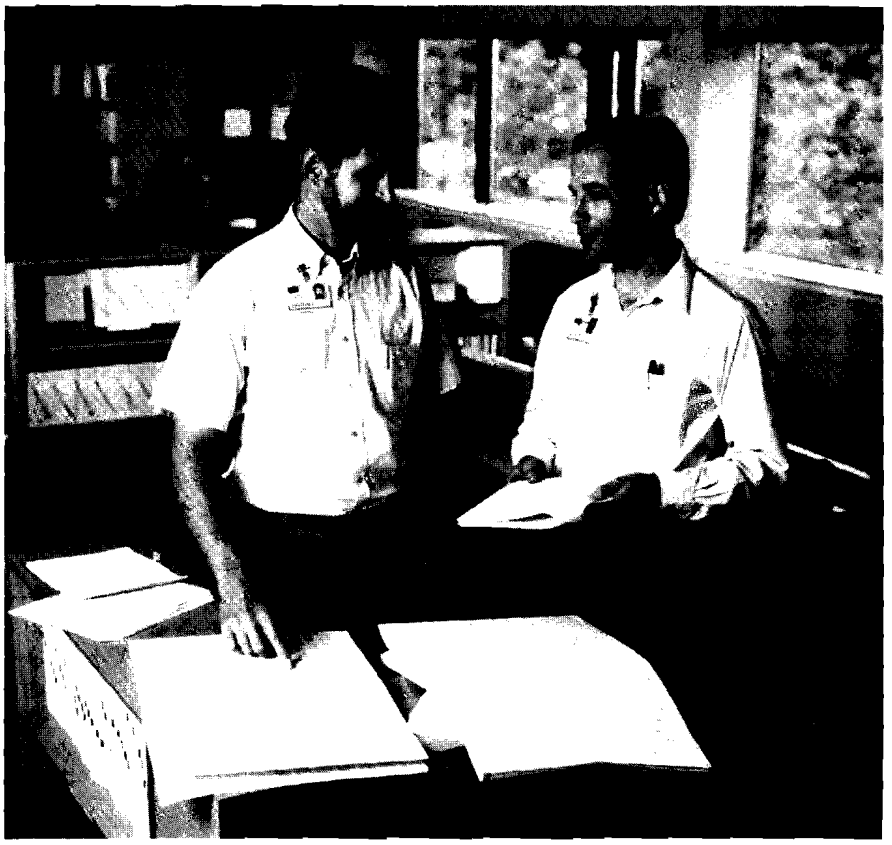

Jacques Delettrez and Reuben Epstein, scientists from the Theory and Computation Group, are shown examining simulation results in the newly expanded library on the second floor of the 1988 Laboratory addition.