IN BRIEF

This edition of the LLE Review contains articles on coronalphysics experiments on GDL and OMEGA, advances in x-ray diagnostics, the damage-testing and biological x-ray-diffraction facilities on GDL, progress in target fabrication, and NLUF experiments performed on OMEGA during the second quarter of fiscal year 1983 (January-March 1983). The following are some of the highlights of the work described in this issue:

- Work has continued on harmonic emission from GDL and OMEGA. A systematic study of spectral features of emissions at multiples of half the laser frequency has led to an improved understanding of these emissions as potential underdense-plasma diagnostics.
- Theoretical progress has been made on understanding the two-plasmon-decay instability. This complements the above-mentioned experimental work, since the plasma waves produced by this instability are responsible for many of the harmonic emissions. It has been shown that the spectrum of the most unstable modes depends strongly on the laser wavelength; also, reduced thresholds have been found for non-normal incidence.
- Two x-ray instruments incorporating free-standing x-ray transmission gratings have been developed. They are a spectrally dispersive microscope, used to obtain twodimensional monochromatic images of laser-fusion targets,

and a transmission-grating streak spectrograph which allows for the simultaneous temporal and spectral resolution of target x-ray emission.

- Three additional developments in x-ray diagnostics are reported: high energy (12–14 keV) ionic spectral lines have been recorded with a Von-Hamos spectrograph, mosaic crystals have been used in a geometry which permits both high sensitivity and resolution, and twodimensional imaging of 10-µm resolution has been achieved using Laue diffraction.
- Improvements have been made to the laser-driven x-raydiffraction facility on GDL, and results have been obtained on time-resolved x-ray diffraction from photostimulated biological systems.
- An experimental system has been developed to better characterize the damage process in thin-film coatings. The crucial role played by impurities of sub-micron size has been established.
- New techniques have been developed for fabricating laser-fusion targets with ablation layers containing varying amounts of high-atomic-number material. Two polymeric materials and two coating techniques have been investigated.
- A computer-based system has been developed for the collection and reduction of visible spectroscopic data, permitting a turnaround time of a few seconds rather than several hours. This system was used in the harmonic-emission experiments on OMEGA.
- Spectra have been recorded of several high-Z ions in an NLUF experiment, and several new atomic levels have been identified.

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Bill Lockman, operator of the Glass Development Laser, adjusting the pinhole of one of the vacuum spatial filters. Accurate alignment of the laser beam through these pinholes is crucial for obtaining good beam quality.