

Section 3

NATIONAL LASER USERS FACILITY NEWS

During the third quarter of FY90 NLUF activities centered on (1) experiments by **H. Griem** (University of Maryland) and **C. Hooper** (University of Florida) performed on the OMEGA laser; (2) an Air Force-funded experiment by **G. Banas** (University of Illinois) on the GDL laser; and (3) an NLUF Steering Committee meeting. In addition, **A. Honig** (Syracuse University) ran a fit check of his cold-entry, target-handling system using the OMEGA target chamber.

J. Marino of H. Griem's group used a series of target shots on the OMEGA laser to measure the characteristics of XUV emission from multilayer targets. The time dependence of the x-ray spectral emission was measured with the SPEAXS instrument; the XUV spectral time dependence was measured with the University of Maryland's McPigs spectrograph. The data collected from these target shots has been taken to Maryland for analysis.

C. Hooper and several students are collaborating with LLE scientists to measure high-density implosions of argon-filled plastic shells. The first series of shots used 250- μm -diam targets filled with 2, 5, and 10 atm of argon. The time dependence of the Ar emission was measured with the SPEAXS diagnostic. In addition, several other x-ray instruments were used to characterize the x-ray emission of these targets. The data is being

digitized at LLE while the analysis is proceeding at both LLE and the University of Florida.

A. Honig has been constructing a cold-entry, target-handling system for the OMEGA target chamber. This system is necessary for the implosion of spin-polarized targets for the Syracuse NLUF experiment and will be useful for future gas-filled, plastic-microballoon targets needed for ICF. The fit check to the OMEGA target chamber identified areas of work for the system to mate to the OMEGA cryogenic shroud. This work is proceeding at Syracuse and additional checks are planned for the target chamber.

G. Banas is collaborating with **H. Elsayed-Ali** of LLE to measure the effect of laser-shock hardening of metal weldments. This work was approved for laser time but not DOE funding for FY90. Since the Steering Committee meeting, these investigators have received funding from the Air Force and are proceeding with experiments on the GDL laser. The GDL laser is used at a 1.054- μm wavelength and directly illuminates a weldment. The weldment is then characterized at the University of Illinois.

The NLUF Steering Committee met 24 April 1990 to review proposals for FY91. There were 11 proposals submitted for consideration. Six of these proposals were recommended for laser time and funding by DOE. The approved experiments for FY91 were

- (1) Time-Resolved Emission and Absorption Spectroscopy of High-Density Plasmas in Spherical and Planar Geometry;
- (2) Study of the Sodium-Neon Photopumped X-Ray Laser Using High-Power Laser Irradiation of High-Density Planar Gas Jet to Create the Neon Lasand;
- (3) Fusion with Highly Spin Polarized HD and D₂;
- (4) Experimental Studies of Radiative Properties of High Energy Density Matter;
- (5) Atomic Structure of Ni-Like, Soft X-Ray Lasing Ions;
- (6) Development of a New Plasma Diagnostic of the Critical Surface and Studies of the Ion Acoustic Decay Instability Using Collective Thomson Scattering.

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