

### Section 3

## NATIONAL LASER USERS FACILITY

## NEWS

During the fourth quarter of FY89 there were three NLUF activities: a visit by **C. F. Hooper** of the University of Florida to plan for future target shots on OMEGA; a series of GDL experiments conducted by **K. Mizuno** from **J. DeGroot's** group at the University of California at Davis (UCD); and a meeting of the NLUF Steering Committee to review FY90 proposals.

C. F. Hooper is collaborating with the LLE staff in conducting a series of implosions of argon-filled plastic shells. Two series of experiments are planned: The first will use a set of targets that duplicate those shot during December 1987. These targets were filled with pure Ar at varying pressures. Results from these implosions have been published in *Physical Review Letters*. The second set of targets will use the Ar as a seed gas in D<sub>2</sub>-filled plastic shells. Different mixtures of Ar and D<sub>2</sub> will be used, and spectra of the Ar ions will be measured. The added data from the Ar spectra should give more information about the core conditions of the D<sub>2</sub> implosion.

J. DeGroot's group has been collaborating with **W. Seka** of LLE to measure plasma instabilities associated with the laser irradiation of solid targets. The primary objective of this experiment is to measure the ion acoustic decay instability (IADI) for targets of various atomic numbers. This is a continuation of work done at UCD with microwave sources and at LLE with GDL. Recent shots at LLE have studied the atomic-number dependence of the IADI over a larger range of

irradiation conditions. The data are to be analyzed at UCD and LLE and a series of experiments on the OMEGA laser system is in the planning stage.

The NLUF Steering Committee met on 18 July 1989. In attendance were **Dean B. Arden**, University of Rochester; **Dr. J. Knauer**, University of Rochester; **Mr. G. D'Alessio**, Department of Energy; **Dr. K. Hill**, Princeton Plasma Physics Laboratory; **Dr. W. Kruer**, Lawrence Livermore National Laboratory; **Dr. K. Matzen**, Sandia National Laboratory; **Dr. D. Nagel**, Naval Research Laboratory; **Dr. J. Perez**, University of Auburn; and **Dr. E. Spiller**, IBM Watson Research Laboratory.

Ten proposals for FY90 were reviewed by the committee, and recommendations were then passed on to the DOE San Francisco office, where final decisions on funding were made and principal investigators were notified. Funding for FY90 is expected to remain at \$600,000, implying that only a few of the proposals can be accepted.

The following proposals were submitted for FY90:

1. X-Ray Contact Microradiography and Shadow Projection Microscopy Using a Laser-Produced Plasma;
2. Fusion with Highly Spin-Polarized HD and D<sub>2</sub>;
3. A New Diagnostic Technique to Simultaneously Measure the Electron Temperature, Ionic Charge State, and Plasma Density near the Critical Surface in Laser-Plasma Interaction Experiments;
4. Time-Resolved Extreme-Ultraviolet Spectroscopy of Laser-Produced Plasmas Originating at the Parylene Layer of Microballoon Targets;
5. Time-Resolved Emission and Absorption Spectroscopy of Laser-Driven Implosions;
6. Induction of ICF with Diffraction-Free Laser Beams;
7. Laser Shock Deformation and Microstructural Modification of Metals;
8. X-Ray Crystal Devices for Measuring Compression and Stability of Laser Fusion Targets;
9. A Time-Dependent Study of the Ionization Dynamics in a Laser-Produced Plasma from a Supersonic Gas Jet; and
10. XUV Spectroscopic Studies at the OMEGA Laser.

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