

## Section 4

# NATIONAL LASER USERS FACILITY NEWS

National Laser Users Facility (NLUF) activity during the fourth quarter of FY86 supported the experiments of **Dr. J. G. Jernigan** from the Space Sciences Laboratory at the University of California, Berkeley; **Professor C. F. Hooper** from the University of Florida; **Dr. T. R. Fisher** from the Lockheed Palo Alto Research Laboratory; and **Professor C. J. Joshi** from the University of California, Los Angeles. The experiments of Dr. Jernigan, Dr. Fisher, and Professor Joshi are in the initial stages of setup and experimental review. Professor Hooper visited the NLUF to review data collected during FY86 experiments.

Dr. Jernigan is collaborating with **Dr. F. Marshall** of LLE on the development of a two-dimensional PIN diode array that can be used with x-ray detectors. The objective is to place this array on LLE's 8-in. pinhole camera to get an image of a radiating target. The PIN diode array has 10 x 64 elements, with a 120- $\mu\text{m}$  x 120- $\mu\text{m}$  pixel size. The array has arrived from the University of California, Berkeley. During this quarter, the interface electronics has been connected via Ethernet to the LLE image-processing system. The PIN diode array has been tested with a dc x-ray source to make sure that it was not damaged in shipment. The apparatus is now ready to mount on the pinhole camera and be installed on the OMEGA target tank.

Professor Hooper carried out spectroscopic studies of targets with krypton mixed with the deuterium-tritium. X-ray lines have been identified for Kr XVIII – Kr XXIV transitions from time-integrated x-ray spectra.

Time-integrated, spatially resolved spectra were shown by **Dr. P. Audebert** of LLE and will be used by the University of Florida researchers in their analysis. Time-resolved data from the SPEAXS spectrometer (developed by **Dr. P. Jaanimagi** of LLE and **Professor B. L. Henke** of Lawrence Berkeley Laboratory) were presented by Dr. Jaanimagi. All of this data will be used to develop diagnostic methods to measure the temperature and density of imploded target cores.

Dr. Fisher visited LLE for an experimental design review of the supersonic gas-jet experiment. The jet has been characterized by Lockheed scientists and has been shown to be a Mach-6 jet with a peak density of  $2 \times 10^{18}$  atoms/cm<sup>3</sup>. This is by a factor of 5 less than the value  $10^{19}$  atoms/cm<sup>3</sup> stated in the proposal, but was shown to be sufficient to get the time-dependent data desired. Initial laser-heating experiments have been done at Lockheed with a neon gas. Spectral lines from Ne V – Ne VIII appeared in the x-ray spectrum. Dr. Fisher also showed data taken with a strip-line x-ray diode array fitted to the Rowland circle of a grazing-incidence spectrograph. Signal levels were in the range of 5 mV–20 mV. Some tests of the OMEGA target chamber environment need to be made so that these small signals can be recorded.

Professor Joshi has received funding for his self-focusing and filamentation instability experiment on GDL. Sketches of the GDL target chamber and current GDL parameters were sent to him for the design of the experiment. When this is completed, a design review will be held at LLE.

Proposals for consideration for the FY88 funding cycle are due by 15 December 1986.

For more information regarding proposal guidelines and the resources available at the National Laser Users Facility, please contact:

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