LLE/NROTC Intern Program: The University has announced the selection of three 2015 summer internships for the second year of the Donald and Linda Winter LLE/NROTC Intern Program aimed to promote the nation's Naval Nuclear Propulsion Program. Candidates for selection must have an interest in the nuclear power program and must have demonstrated high academic achievement. The interns participate in a research project at LLE and work closely with LLE scientists. The 2015 interns are Midshipman Lindsey Curtis, a U of R junior majoring in Computer Science; Midshipman Jenna Becerra, a U of R sophomore majoring in Electrical and Computer Engineering; and Midshipman Timothy R. Cooper, an RIT junior majoring in Applied Mathematics (Fig. 1). The 2014 interns, Midshipman Daniel Tucker and Midshipman Ari Shaps, both U of R seniors, completed research projects entitled Proton Imaging in Magnetic Fields and Measuring the Surface Activity of Tritiated Copper Using an X-Ray Detection System, respectively. Both have been accepted into the Naval Nuclear Propulsion Program and will start nuclear power training upon receiving their commissions as ensigns in the United States Navy in May 2015.

Figure 1. The LLE/NROTC 2015 summer interns (left to right) are Midshipmen Timothy R. Cooper, Lindsey Curtis, and Jenna Becerra.

KBFRAMED Magnification and Resolution: The newly installed plasma diagnostic on the OMEGA target chamber, KBFRAMED, consists of a 16-image Kirkpatrick–Baez (KB) x-ray microscope coupled to a four-strip, high-speed framing camera (see also the description in the February 2015 DOE Monthly Report). The concept of the imaging system is described in Refs. 1 and 2. A photograph of the optical assembly is shown in Fig. 2. Recently both the image magnification and spatial blurring of the framed imaging system have been measured precisely using grids backlit by x rays emitted from Au foils, illuminated by OMEGA beams. The results of one such target shot are shown in Fig. 3: image 10 of 16 of the backlit grid taken with a high-speed framing camera (30-ps time gating). The grid consists of 0.001-in.-diam (25.4-μm) copper wires spaced by 0.002 in. (i.e., 500 per inch). The resulting magnification of the grid image was determined to be 12.0 within 1%. The net blurring resulting from the combination of optic aberrations and framing camera blurring is ~6 μm (FWHM) at the target plane. These determinations are used to infer the actual size of the cryogenic target hot spots from the recorded image size, and to estimate any effect on this size determination caused by the measured blurring. When combined with measurements of burnwidth, neutron yield, and ion temperature, the KBFRAMED measured hot-spot sizes make it possible to infer the hot-spot central pressure.

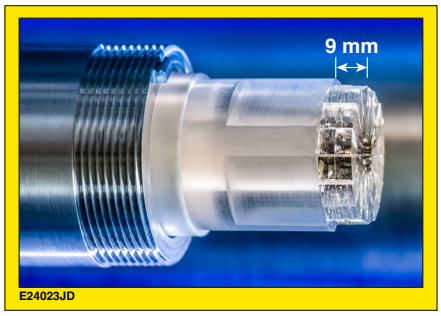

Figure 2. Photograph of the KBFRAMED diagnostic—a 16-image optical assembly in an OMEGA Kirkpatrick–Baez microscope optic mount with the blast shield removed.

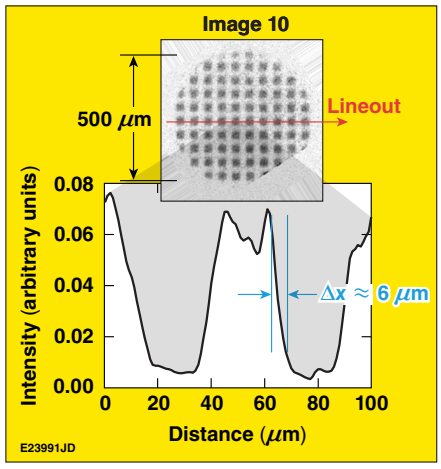

Figure 3. Image of a backlit Cu mesh taken with KBFRAMED in the OMEGA target chamber.

Omega Facility Operations Summary: The Omega Facility conducted 165 target shots in March 2015 with an average experimental effectiveness (EE) of 96.7% (129 on the OMEGA laser with an EE of 98.4% and 36 on OMEGA EP with and EE of 90.3%). The ICF program accounted for 29 target shots for experiments led by LLNL, LLE, and SNL, while the HED program had 62 shots for experiments led by LANL, LLNL, and LLE. Twenty-one target shots were taken for two NLUF experiments led by Princeton University and the University of California, Berkeley; and four LBS experiments led by LLNL and LLE had 53 target shots.

1. F. J. Marshall, Rev. Sci. Instrum. **83**, 10E518 (2012).
2. F. J. Marshall, J. A. Oertel, and P. J. Walsh, Rev. Sci. Instrum. **75**, 4045 (2004).

Contact: John M. Soures (585) 275-3866; fax: (585) 256-2586; e-mail: jsou@lle.rochester.edu