OMEGA Cryogenic Target Development: The cryogenic targets originally used in the LLE cryogenic-capsule-implosion campaigns were supported by four spider silks.[1] To minimize the mass perturbation from the glue spots inherent in the four-silk support, single-stalk supports were recently implemented. This change in the structure introduced a thermal asymmetry to the ice layer. Proportionally, more heat per unit area was lost from the target through the support stalk than was lost through the surrounding helium gas, leaving the ice cooler and therefore thicker in the region of the stalk. Ice layers that routinely possessed a roughness less than 1-μm rms with the silk supports now had a roughness of 2- to 4-μm rms, and the ice was up to 16 μm thicker in the region where the stalk attached to the capsule. This perturbation was removed by illuminating the capsule with 800-nm wavelength light from a laser diode. Adjusting the intensity of the light allowed the temperature of the stalk to be independently controlled, which made it possible for the areal heat flow down the stalk to be matched with the heat flow from elsewhere on the target's surface.

A cryogenic target supported on an 18-μm-diam silicon-carbide fiber and containing a 65-μm-thick DT-ice layer shows the effect of the process: The image in Fig. 1(a) shows the target without the IR illumination and the ice is 16 μm thicker at the stalk. Figure 1(b) shows the same view of the target with the IR illumination at an optimal power setting. The ice roughness for this view is 0.6 μm and the roughness for the entire ice surface is 0.8-μm rms.

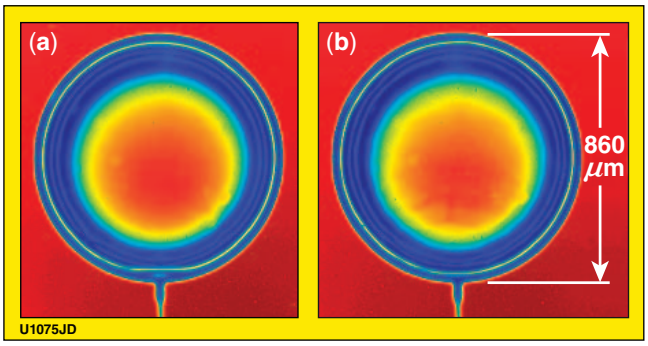

Figure 1. Shadowgraph of single-stalk-mounted cryogenic-DT capsules: (a) target without 800-nm illumination (note that the DT ice is thicker near the stalk) and (b) same view of the target with 800-nm illumination showing significantly improved uniformity.

Visit by Dr. Steven Koonin: Dr. Steven Koonin, Under Secretary for Science, U.S. Department of Energy, visited LLE on 21 July accompanied by Dr. Kimberly Budil, Advisor to the Under Secretary for Science and Ms. Carla Frisch, Special Advisor to the Under Secretary for Science. During his visit, Dr. Koonin learned about the critical role LLE plays in the National Ignition Campaign (NIC) with particular emphasis on the NIC experiments being conducted at the Omega Laser Facility and the multitude of diagnostic systems that have been developed at LLE for use in the NIC. During his visit, he spoke with graduate students and young scientists who are conducting research at LLE (see Fig. 2).

Figure 2. Dr. Koonin engaged in a discussion with graduate students Maria Alejandra Barrios (left) and Lan Gao (right) during a luncheon meeting with graduate students and young scientists at LLE.

Omega Operations Summary: The Omega Facility conducted a total of 153 target shots in July with an overall experimental effectivenessof 97%. One hundred twenty-nine of these shots were conducted on the OMEGA laser and twenty-four on OMEGA EP with an average experimental effectiveness of 96.9% and 97.9%, respectively. The National Ignition campaign accounted for 62 target shots taken for experiments led by teams from LANL, LLE, and LLNL. HED experiments conducted by teams led by LLNL scientists received 63 target shots. Other campaigns that were conducted in July included NLUF (7 shots for a team led by the University of Washington), LBS (10 shots for a team led by LLE), and FSC (11 shots).

1. D. R. Harding *et al.*, J. Phys., Conf. Ser. **112**, 022001 (2008).

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