

LLE High School Student Research: For 14 years LLE has operated a program to educate and train a limited number of high school students entering their senior year. The program provides a hands-on opportunity to experience research in science and technology; it also helps promote enthusiasm about scientific and technical careers among some of the brightest students from the Rochester metropolitan area. Fifteen students (the largest yet hosted by LLE) from eleven area high schools participated in the 2002 Summer High School Research Program. All of the students were teamed with LLE staff advisors and spent eight weeks working on individual research projects. Each year, the program culminates in a symposium where the students present their findings to family, teachers, and members of the Laboratory scientific and technical staff. Fourteen of the student participants in the 2002 program are shown in Fig. 1.

In the past, several participants of this program have gone on to become semifinalists and finalists in the prestigious, nationwide Intel Science Talent Search. This year, the LLE program was particularly productive, resulting in the selection of three students [Joy Yuan, Phoebe Rounds, and Siddhartha Ghosh (see Fig. 2)] as among the 300 semifinalists nationwide in this competition. Ghosh carried out experimental work on improving the high-speed x-ray streak cameras used on OMEGA. Rounds designed new frequency-conversion systems using various numbers of tripler crystals to generate over 2 THz of UV bandwidth, and Yuan performed computer simulations of optical parametric chirped-pulse amplification. Phoebe Rounds was selected as a finalist in the Talent Search—an honor bestowed upon only 40 of the nearly 1600 participating students from all over the United States. In addition to her honors in this competition, Rounds has also earned many other awards in music composition, literature, math, and science.

NIF Recognition Award: The Optical Manufacturing Group (OMAN) at the Laboratory for Laser Energetics recently received a recognition award for the manufacture of high-damage-threshold coatings for the National Ignition Facility laser (Fig. 3). In 1995, LLNL and LLE started a collaborative project to develop NIF coatings. The program focused on improving source stability, process monitoring, damage threshold, and stress control. For the last 18 months, OMAN has been ramping up to a production phase that is expected to continue at a rate of ~13 optics per month through 2007. LLE is coating approximately half of the NIF mirrors and polarizers and is also responsible for the assembly and coating of the NIF deformable mirrors. To date, 6 of the 192 deformable mirror assemblies have been completed; 16 of 197 LM1 deformable mirror optics, 10 of 98 polarizers, 37 of the 202 LM2 cavity mirrors, and 104 of the 397 transport mirrors have been coated and accepted.

OMEGA Operations Summary: OMEGA produced 115 target shots in January 2003 for LLE, LLNL, and LANL campaigns. LLE programs had a total of 31 target shots for the ISE and cryogenic target implosion programs. LLNL carried out a total of 54 target shots on campaigns that included NIF early light (NEL) hydrodynamics, shocked opacity, hot hohlraums, radiation hydrodynamics, and dynamic hohlraums. The LANL campaigns included a total of 30 shots for asymmetric direct-drive and cylindrical mix (CYLMIX) experiments. In January three days were assigned to the qualification of a new backlighter diode-pumped regenerative amplifier system and work on power balance.



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Figure 1. LLE Summer High School Research Program participants in the OMEGA laser facility.



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Figure 2. (left to right) Intel Science Talent Search semifinalist Joy Yuan (Pittsford-Mendon High School), finalist Phoebe Rounds (Irondequoit High School), and semifinalist Siddhartha Ghosh (Pittsford Mendon High School).



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Figure 3. The NIF recognition award given to OMAN highlights some of LLE's key contributions to the NIF project.