

**Summer High School Research Program:** During July and August of this year, 13 students from Rochester-area high schools participated in LLE's Summer High School Research Program (Fig. 1). This marks the 30th year of the program, which started in 1989. The students, all rising seniors, worked on individual research projects with LLE scientists and engineers for eight weeks. The projects were all related to current research activities at LLE and covered a broad range of areas of interest, including computer modeling of implosion physics, experimental diagnostic modeling, cryogenic target characterization, physical chemistry (Fig. 2), computational chemistry, laser beam modeling, laser flash-lamp diagnostics, web-based data analysis, and the adaptation of a technique developed to visualize laser damage to high-school life-science education. At the end of the program the students presented the results of their research at a half-day symposium to an audience including parents, teachers, and LLE staff. Entry to the program is highly competitive, with ~60 students applying each year. Over 50 local schools have had students in the program and ~100 LLE personnel have advised students.

Three hundred and seventy seven high school students have now participated in the unique educational experience provided by this program, which introduces the students to scientific research in a real environment. The students attend weekly seminars on technical topics associated with LLE's research and topics of general scientific interest. They receive safety training, learn how to give scientific presentations, and write project reports that are critiqued by their advisors and the program director and published on the LLE web site. Many students from the program have entered their project reports into the highly competitive Regeneron (formerly Westinghouse and Intel) Science Talent Search. Since the inception of LLE's program, a total of 36 students have been designated as scholars and four have become finalists. Many LLE publications and conference presentations have included work carried out by students from the program.

Students use their research experience at LLE to leverage admission to many of the top undergraduate schools in the U.S., where they continue to seek research opportunities in a diversity of scientific areas. Approximately 150 students have received advanced degrees. Alumni of the program are engaged in a wide range of careers, including physics, chemistry, engineering, medicine, business, finance, law, university teaching, and research.

**Omega Facility Operations Summary:** The Omega Laser Facility conducted 259 shots with an average experimental effectiveness (EE) of 96.9%. One hundred and sixty-one of these shots were taken on the OMEGA laser including 16 shots jointly with the OMEGA EP with an EE of 95.7% and 98 shots were taken using the OMEGA EP laser with an EE of 99.0%. The ICF Program carried out 69 target shots for experiments led by LLE and LLNL, while the HED Program accounted for 111 target shots led by LLNL, LANL, and LLE. Two NLUF experiments led by General Atomics and the University of Michigan had 14 target shots and five LBS experiments led by LLNL and LLE had 49 target shots.



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Figure 1. Members of LLE's 2018 Summer High School Research Program with program director Stephen Craxton.



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Figure 2. Maia Raynor (Brighton High School) working on her experiment to characterize a copper-zinc alloy for its use as an alternative concept for extracting molecular tritium from air streams.