LLE's Summer High School Research Program

During the summer of 1997, ten students from Rochester-area high schools participated in the Laboratory for Laser Energetics' Summer High School Research Program. The goal of this program is to excite a group of high school students about careers in the areas of science and technology by exposing them to research in a state-of-the-art environment. Too often, students are exposed to "research" only through classroom laboratories, which have proscribed procedures and predictable results. In LLE's program, the students experience all of the trials, tribulations, and rewards of scientific research. By participating in research in a real environment, students become more excited about careers in science and technology.

The students spend most of their time working on individual research projects with members of LLE's technical staff. The projects, which can typically be completed during the eight-week period, originate from all areas of interest in the laboratory: from plasma physics and optics to chemistry and materials science. The projects vary from year to year depending on LLE's requirements. An example of the breadth of projects is shown in Table 72.XI, where the students and their projects from 1997 are listed.

Table 72.XI: High School Students and Projects—Summer 1997.

Student	High School	Supervisor	Project
Devon J. Battaglia	Greece Arcadia	M. Guardalben	Analyzing Aberrations in a Laser System Using a Liquid Crystal Point-Diffraction Interferometer
Daniel Bouk	Greece Athena	S. Craxton	Beam Phasing for Indirect-Drive Experiments on OMEGA
Anthony E. Green	Bishop Kearney	W. Donaldson	Constructing and Characterizing a Diode Laser
Lisa Haber-Thomson	Brighton	I. Walmsley	Femtosecond Autocorrelation Measurements Based on Nonlinear Two-Photon Induced Photocurrent
Yanlin Liu	Brighton	J. Delettrez	Fourier Decomposition of Rayleigh–Taylor Unstable Surfaces
Sarah Mitchell	The Harley School	K. Marshall	Self-Organizing Lyotropic Liquid Crystals Based on Cellulose Derivatives
Matthew T. Pandina	Rush–Henrietta	J. Kelly	Lower-Level Lifetime and its Effects on Square-Pulse Distortion
David Rea	Honeoye Falls-Lima	T. Kessler	High-Efficiency Silver Halide Holographic Diffraction Gratings: Production, Evaluation, and Results
Danielle Schillinger	Our Lady of Mercy	R. Epstein	The Effect of Rayleigh–Taylor Instability of Compressible Fluid
Jeremy Yelle	Honeoye Falls–Lima	J. Knauer	The Calibration of Plasma/X-Ray Calorimeters

The students attend weekly seminars on technical topics associated with LLE's research, including an introduction to lasers in general, to LLE's 60-beam OMEGA laser, and to plasma physics and controlled fusion. The students also receive safety training and are introduced to LLE's resources, especially the computational facilities. Topics have also included introductions to nonlinear optics, instabilities, data analysis, numerical methods, and ethics.

The program culminates with the High School Student Summer Research Symposium at which the students present the results of their research. They also prepare written reports, which are bound into a permanent record of their work. These reports are available by contacting LLE.

Eighty-two high school students have participated in the program since it began in 1989. Each year students are selected from approximately 50 highly qualified applicants.

In 1997, LLE added a new component to its high school outreach activities: an annual award to an Inspirational Science Teacher. This award honors teachers who have inspired our High School Program participants in the areas of science, mathematics, and technology. The students in our program have been exceptional, and we are honoring those teachers who have brought them to this point. The award is presented at the High School Student Summer Research Symposium and includes a $1000 cash prize. Alumni of our Summer High School Research Program nominate teachers for the award. The 1997 winner is Mr. Raymond Sherbinski from Brighton High School. Mr. Sherbinski, a mathematics teacher, inspired Daniel Nelson, a participant in our 1994 program. In nominating Mr. Sherbinski, Daniel wrote, "I left my year with Mr. Sherbinski with renewed vigor for not only math, but for all learning. Mr. Sherbinski creates a class atmosphere that removes a student's inhibitions toward risking vocal expression of ideas before his or her peers."