LLE's Summer High School Research Program

During the summer of 2005, 15 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 prescribed procedures and predictable results. In LLE's summer program, the students experience many of the trials, tribulations, and rewards of scientific research. By participating in research in a real environment, the students often become more excited about careers in science and technology. In addition, LLE gains from the contributions of the many highly talented students who are attracted to the program.

The students spent most of their time working on their individual research projects with members of LLE's technical staff. The projects were related to current research activities at LLE and covered a broad range of areas of interest including computational hydrodynamics modeling, cryogenic target fabrication and characterization, liquid crystal chemistry, materials science, the development and control of laser fusion diagnostics, and OMEGA EP Laser System design and engineering (see Table 104.II).

The students attended weekly seminars on technical topics associated with LLE's research. Topics this year included laser physics, fusion, holographic optics, fiber optics, and femtosecond lasers and their applications. The students also received safety training, learned how to give scientific presentations, and were introduced to LLE's resources, especially the computational facilities.

The program culminated on 24 August with the "High School Student Summer Research Symposium," at which the students presented the results of their research to an audience including parents, teachers, and LLE staff. The students' written reports will be bound into a permanent record of their work that can be cited in scientific publications. These reports are available by contacting LLE.

One hundred ninety-one high school students have now participated in the program since it began in 1989. This year's students were selected from approximately 50 applicants.

At the symposium, LLE presented its ninth William D. Ryan Inspirational Teacher Award to Mr. Stephen Locke, a chemistry teacher at Byron-Bergen High School. This award is presented to a teacher who motivated one of the participants in LLE's Summer High School Research Program to study science, mathematics, or technology and includes a $1000 cash prize. Teachers are nominated by alumni of the summer program. Mr. Locke had the rare distinction of receiving his nomination from a whole family—Christine Balonek (2002) and her brothers Gregory, Robert, and Daniel (2004). "In the classroom, Mr. Locke's wealth of knowledge and fervor for chemistry in combination with his sense of humor, patience, and dedication to his students create an ideal teacher," Christine Balonek writes in her nomination letter. "He is never too busy to help a student during a study hall or after school with any science work. His endless devotion to students and the community is one worthy of recognition." According to her brother, Robert, "Mr. Locke not only taught the material given by the state, he also brought in real-life applications. His teaching methods brought home for me the power of science and technology." David Pescrillo, principal of Byron-Bergen High School, added, "Stephen is an excellent teacher who expects the best from his students. He is very kids-oriented. He comes in during the summer, during the weekends, and after school hours on his own time to tutor the kids who need help. He is a phenomenal guy!"

Table 104.II: High School Students and Projects—Summer 2005.

Name	High School	Supervisor	Project Title
Mary Brummond	Honeoye Falls-Lima	M. Guardalben	OMEGA EP Pulse Compressor Modeling: Misalignment and Power Errors
Philip Chang	Pittsford Sutherland	K. Marshall	Computational Modeling and Analysis of Nickel Dithiolene Structures
Brandon Corbett	Allendale Columbia	T. Collins/ R. Bahukutumbi	Optimization of High-Gain ICF Targets for the National Ignition Facility
Adam DeJager	Greece Odyssey	S. Morse/ R. Kidder	Optical Time-Domain Reflectometry on the OMEGA EP Laser
Frank Fan	Webster Schroeder	S. Craxton	A Model for Cryogenic Target Layering
Alex Grammar	Brighton	R. Boni/ P. Jaanimagi	Relative Quantum Efficiency Measurements of Streak Camera Photocathodes
Stewart Laird	Harley School	J. Knauer	Characterization of a Compound Refractive Lens
Brian MacPherson	Penfield	R. Epstein	Dynamic Energy Grouping in Multigroup Radiation Transport Calculations
Karyn Muir	Honeoye Falls-Lima	J. Lambropoulos	Micromechanics and Microstructure in WC Hard Metals
Brian Pan	Penfield	W. Seka	Improving the Illumination Uniformity of Cryogenic Targets Inside a Layering Sphere
Nicholas Ramos	Palmyra-Macedon	S. Mott/ D. Lonobile	Automated X-Ray Framing Camera Characterization
Valerie Rapson	Greece Olympia	K. Marshall	Contaminant-Resistant Sol-Gel Coatings
Martin Wegman	McQuaid	W. Donaldson	Superconducting Electronics for the ICF Environment
Lauren Weiss	Brighton	L. Elasky	Categorization and Analysis of Defects in Cryogenic Targets
Rosie Wu	Brighton	D. Edgell/ S. Craxton	Analysis of Inner Ice Surface Perturbations Using Bright Ring Characterization