
LLE's Summer High School Research Program

During the summer of 2003, 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 laser optics modeling, laser-beam alignment, analysis of OMEGA implosion experiments, plasma physics modeling, cryogenic target physics, liquid crystal chemistry, molecular modeling, and the development and control of laser fusion diagnostics (see Table 96.V).

The students attended weekly seminars on technical topics associated with LLE's research. Topics this year included lasers, fusion, holographic optics, atomic force microscopy, experimental error analysis, computer-controlled optics manufacturing, and microcontrollers 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 27 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 and sixty high school students have now participated in the program since it began in 1989. This year's students were selected from approximately 60 applicants.

In 2003, LLE presented its seventh William D. Ryan Inspirational Teacher Award to Mr. Michael Carges, a former physics teacher at Pittsford-Mendon High School and currently at Greece Athena High School. This award, which includes a \$1000 cash prize, was presented at the High School Student Summer Research Symposium. Alumni of the Summer High School Student Research Program were asked to nominate teachers who had played a major role in sparking their interest in science, mathematics, and/or technology. Mr. Carges was nominated by Joy Yuan and Siddhartha Ghosh, participants in the 2002 Summer Program.

Mr. Ghosh wrote: "The knowledge he imparts to them [his students] set him aside from many other teachers I have had in the past. Mr. Carges strives to inspire those around him in many ways..... Mr. Carges' instruction in class was truly one of the most exemplary models I have encountered in high school."

Ms. Yuan wrote: "It takes a special kind of person to be a superior teacher. This person must have a passion for teaching and demonstrate dedication toward his job as the mold of our minds. He must have a thorough understanding of the material and knowledge..... Mr. Carges was one of the few teachers who knew what they were talking about. He was able to translate [to his students] what physicists have spent centuries doing."

Table 96.V: High School Students and Projects—Summer 2003.

Name	High School	Supervisor	Project Title
Christine Beaty	Livonia High School	C. Stoeckl	Controlling Scientific Instruments Using JAVA on LINUX
Ryan Blair	Canandaigua Academy	R. Boni/ M. Millechia	Characterization of the OMEGA UV Spectrometer
George Dahl	Allendale Columbia	M. Guardalben	Pulse-Shaping Effects in Optical Parametric Amplification
Margot Epstein	Sodus Central High School	W. Bittle/ J. Depatie	Automated Laser-Beam Steering
Wen-Fai Fong	Pittsford Sutherland	R. Epstein	Non-LTE Effects on the Speed of Sound in Plasmas
Christopher Forbes	Eastridge Senior High	P. Jaanimagi	Energy and Angular Distributions of Secondary Electrons Under High Electric Field
Nathaniel Gindele	Brighton High School	J. Knauer	Deconvolution and Calibration of Diamond PCD Detectors
Rohan Kekre	McQuaid Jesuit	S. Craxton	Tuning Multiple Triplers Using the UV Spectrometer
Kathryn Knowles	Churchville-Chili	J. Delettrez	Analysis of the Ablation Process in Rayleigh–Taylor Unstable Implosions
Nadine Lippa	Byron-Bergen	A. Schmid	Single-Molecule Fluorescence in Liquid Crystal Hosts
Anthony Noto	Greece Athena	K. Marshall	Development of Weighted Chiral Indices: Their Use in Modeling Nickel Dithiolene Systems
Benjamin Schmitt	Greece Arcadia	F. Marshall	X-Ray Microscope Mirror Characterization
Nicole Toscano	Greece Arcadia	V. Smalyuk	Compressed Core Characterization of a Cryogenic D ₂ Target at Peak Neutron Production
Cam Tran	Wilson Magnet	K. Marshall	Photochemically Induced Alignment of Liquid Crystals on a Polymer Surface
Michael Wozniak	Greece Athena	D. Harding/ S. Craxton	The Effects of Nonuniform Illumination on the Shape of Deuterium Ice Layers