

**2000 SUMMER RESEARCH PROGRAM FOR HIGH SCHOOL JUNIORS**

**AT THE**

**UNIVERSITY OF ROCHESTER'S**

**LABORATORY FOR LASER ENERGETICS**

**STUDENT RESEARCH REPORTS**

**PROGRAM COORDINATOR**

**Dr. R. Stephen Craxton**

**LABORATORY FOR LASER ENERGETICS**

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During the summer of 2000, 14 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 modeling and characterization, diagnostic development, hydrodynamics modeling, liquid crystal chemistry, superconductors, optical coatings, laser damage, and the development of a novel laser glass. The students, their high schools, their LLE supervisors, and their project titles are listed in the table. Their written reports are collected in this volume.

The students attended weekly seminars on technical topics associated with LLE's research. Topics this year included lasers, fusion, holography, optical materials, nonlinear optics, the OMEGA Cryogenic Target System, and scientific ethics. 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 with the High School Student Summer Research Symposium on 23 August at which the students presented the results of their research to an audience including parents, teachers, and LLE staff. Each student spoke for approximately ten minutes and answered questions. At the symposium the William D. Ryan Inspirational Teacher award was presented to Mr. James Shannon, a chemistry teacher at Pittsford-Mendon High School. This annual award honors a teacher, nominated by alumni of the LLE program, who has inspired outstanding students in the areas of science, mathematics, and technology.

A total of 117 high school students have participated in the program since it began in 1989. The students this year were selected from approximately 70 applicants. Each applicant submitted an essay describing their interests in science and technology, a copy of their transcript, and a letter of recommendation from a science or math teacher.

LLE plans to continue this program in future years. The program is strictly for students from Rochester-area high schools who have just completed their junior year. Applications are generally mailed out in early February with an application deadline near the end of March. For more information about the program or an application form, please contact Dr. R. Stephen Craxton at LLE.

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### High School Students and Their Projects (2000)

<b>Student</b>	<b>High School</b>	<b>Supervisor</b>	<b>Project</b>
Andrew Campanella	Webster	P. Jaanimagi	Large Area, Low Voltage X-Ray Source
Jill Daum	Rushville	D. Smith/J. Taniguchi	Experimental Simulation of Damage in Spatial Filter Lenses
Abraham Fetterman	Pittsford Mendon	M. Skeldon	Modeling Pulse Shape Distortions in the OMEGA Laser
Ming-fai Fong	Pittsford Sutherland	S. Regan	Experimental Investigation of Smoothing by Spectral Dispersion with Apertured Near Fields
Robert Forties	Irondequoit	F. Marshall	X-ray Sensitivity Measurements of Charge Injection Devices (CID's)
Binghai Ling	Brighton	R. Epstein	Simulation of Plasma Spectra and Images of Foil Targets Using the Prism SPECT3D Radiation-Transport Post-Processor
Anne Marino	Hilton	S. Jacobs	Durable Phosphate Glasses with Low Glass Transition Temperatures
Elizabeth McDonald	Harley	J. Zuegel	Adapting ASBO/VISAR for Foam Targets
Ronen Mukamel	Brighton	S. Craxton	Frequency Conversion of Phase-Aberrated Laser Beams for the National Ignition Facility
Gloria Olivier	Honeoye Falls-Lima	K. Marshall	Improvements in the Strength of Visible Selective Reflection in Lyotropic Liquid Crystals Made from Cellulose Urethanes
Colin Parker	Brighton	J. Marozas	Dynamic Focal Spot Size Using a Static Phase Plate
Priya Rajasethupathy	Brockport	J. Deletrez	Improving Equation of State Tables
John Savidis	Gates-Chili	R. Sobolewski	Characterization of Ultrafast Superconducting Optoelectronic Devices
Stephanie Wolfe	Spencerport	D. Smith/J. Oliver	Coatings for Ultraviolet Lithography