

**2008 SUMMER RESEARCH PROGRAM FOR HIGH SCHOOL JUNIORS**

**AT THE**

**UNIVERSITY OF ROCHESTER'S**

**LABORATORY FOR LASER ENERGETICS**

**STUDENT RESEARCH REPORTS**

**PROGRAM COORDINATOR**

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**LABORATORY FOR LASER ENERGETICS**

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During the summer of 2008, 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 scientific staff. The projects were related to current research activities at LLE and covered a broad range of areas of interest including experimental diagnostic development and analysis, computational modeling of implosion hydrodynamics and radiation physics, database development, materials science, cryogenic target characterization, target vibration analysis, and engineering device development. 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 laser physics, fusion, holography, fiber optics, optical manufacturing, the physics of music, and electronic paper. 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. Each student spoke for approximately ten minutes and answered questions. At the symposium the 12th annual William D. Ryan Inspirational Teacher Award was presented to Ms. Jane Bowdler, a mathematics teacher at Brockport High School. This award honors a teacher, nominated

by alumni of the LLE program, who has inspired outstanding students in the areas of science, mathematics, and technology. Ms. Bowdler was nominated by Priya Rajasethupathy, a participant in the 2000 Summer Program.

A total of 233 high school students have participated in the program since it began in 1989. The students this year were selected from approximately 50 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.

In the past, several participants of this program have gone on to become semifinalists and finalists in the prestigious, nationwide Intel Science Talent Search. This tradition of success continued this year with the selection of two students (Jay Amin and Rachel Kurchin) as among the 300 semifinalists nationwide in this competition.

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. Application information is mailed to schools and placed on the LLE website in early February with an application deadline near the end of March. For more information about the program, please contact Dr. R. Stephen Craxton at LLE.

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<b>High School Students and Projects (Summer 2008)</b>			
<b>Name</b>	<b>High School</b>	<b>Supervisor</b>	<b>Project Title</b>
Jay Amin	Rush-Henrietta	C. Dorrer	Characterization of Ultrashort Optical Pulses by Spectral Shearing Interferometry
Chris Baldwin	Honeyoye Falls-Lima	R. W. Kidder	Exploring Metadata for Laser Diagnostics and Control Systems on the OMEGA EP Laser System
Mohammad Husain Bawany	Brighton	R. Janezic	Development of the Cryogenic Target Information System
Krysta Boccuzzi	Mercy	E. Kowaluk	Investigating the Causes of and Possible Remedies for Sensor Damage in Digital Cameras Used on the OMEGA Laser Systems
David Brummond	Honeyoye-Falls Lima	C. Stoeckl	Controlling a Data Acquisition System with Java
Nicholas Hensel	Fairport	D. Jacobs-Perkins	High-Speed Measurements of Target-Support Vibrations Using Line-scan Cameras
Rachel Kurchin	Harley	R. S. Craxton, M. D. Wittman	Characterization of a Cryogenic Fuel Capsule in a Transparent Hohlraum
Alexis Kurmis	Greece Arcadia	T. C. Sangster, T. Duffy	Counting System for the Carbon Activation Diagnostic
Mangaladevi Patil	Pittsford Mendon	K. L. Marshall	Contamination Resistant Sol-Gel Antireflective Coatings by Vapor-Phase Silanization
Angela Ryck	Fairport	R. S. Craxton	Optimization of Cone-in-Shell Implosions
Collin Sowinski	Penfield	W. T. Shmayda	Minimization of Tritium Contamination on Surfaces
Jack Stokes	Fairport	S. Ingraham, D. J. Lonobile	Investigation of Brushless DC Motor Commutation Techniques
James Tsay	Phillips Academy	R. Epstein	K-Shell Emission-Line Backlighter Source Optimization
Brian Wang	Webster Thomas	J. F. Myatt, P. A. Jaanimagi	The Effects of Space Charge on Electron Pulse Broadening in Streak Cameras
Bradley Wideman	Fairport	F. J. Marshall	Automated Determination of Crystal Reflectivity in the X-ray Laboratory