

2009 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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During the summer of 2009, 16 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, computational modeling of implosion physics, laser physics, experimental and theoretical chemistry, materials science, cryogenic target characterization, target vibration analysis, and computer control systems. 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, glass fracture, nonlinear optics, electrostatics, 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 26 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 13th annual William D. Ryan Inspirational Teacher Award was presented to Mr. Jeffrey Klus, a mathematics teacher at Fairport 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. Mr. Klus was nominated by Nicholas Hensel and Angela Ryck, participants in the 2008 Summer Program.

A total of 249 high school students have participated in the program since it began in 1989. The students this year were selected from a record 80 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 Harvest Zhang as one of 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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High School Students and Projects (Summer 2009)			
Name	High School	Supervisor	Project Title
Dustin Axman	Irondequoit	R. Rombaut, R. Russo	A Graphical User Interface to Oscilloscopes
Leela Chocklingham	Brighton	K. L. Marshall	Abrasion-Resistant Anti-Reflective Sol-Gel Coatings
Ted Conley	McQuaid	J. Bromage	Automated Injection for High-Power Fiber Amplifiers
Cheryl Liu	Pittsford Sutherland	J. P. Knauer	Neutron Detection with High Bandwidth and High Dynamic Range
Trevor Lu	Webster Thomas	D. H. Edgell	X-Ray Phase-Contrast Characterization of Cryogenic Targets
Evan Miller	Pittsford Mendon	J. A. Delettrez	Electron Reflection in Monte Carlo Simulations with the Code GEANT
Lindsay Mitchel	Spencerport	R. S. Craxton	Exploration of the Feasibility of Polar Drive on the LMJ
Justin Owen	Irondequoit	R. W. Kidder, C. Kingsley, M. Spilatro	Using Networked Data Services for System Analysis and Monitoring
Ben Petroski	Livonia	W. T. Shmayda	Water Desorption from Metallic Surfaces at Room Temperature
Aaron Van Dyne	Brighton	J. A. Marozas	Parameter Optimization of 1-D Multi-FM SSD on the NIF
Marisa Vargas	Webster Thomas	C. Dorrer, K. L. Marshall	Laser Beam Shaping with Optically Patterned Liquid Crystals
Kate Walden	Wayne	T. C. Sangster, M. Burke	Bulk Etch Rate Properties of NaOH/Ethanol as a CR-39 Nuclear Track Detector Etchant
Victor Wang	Webster Thomas	K. L. Marshall	Computational Modeling of Optically Switchable Azobenzenes
Paul Watrobski	Penfield	W. Theobald	UV Probe Beam for Plasma Characterization and Channeling Experiments
Mia Young	Penfield	R. Epstein	Including Emissivity in the Analysis of Implosion Radiographs
Harvest Zhang	Brighton	L. D. Lund	Resonance and Damping Characteristics of Cryogenic Fusion Targets