
LLE's Summer High School Research Program

During the summer of 2010, 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 technical 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, opacity data for hydrodynamic simulations, laser physics, experimental and theoretical chemistry, materials science, cryogenic target characterization, target positioning and viewing systems, and database development (see Table 124.II).

The students attended weekly seminars on technical topics associated with LLE's research. Topics this year included laser physics, fusion, holography, nonlinear optics, atomic force microscopy, 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 25 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 made available on the LLE Website and bound into a permanent record of their work that can be cited in scientific publications.

Two hundred and sixty-five high school students have now participated in the program since it began in 1989. This year's students were selected from over 60 applicants.

At the symposium LLE presented its 14th annual William D. Ryan Inspirational Teacher Award to Mr. Brad Allen, a physics teacher at Brighton 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. Allen was nominated by Leela Chockalingam, Aaron Van Dyne, and Harvest Zhang, participants in the 2009 program. Leela described Mr. Allen as "one of the most fantastic science teachers I have had the opportunity to learn under. . .He took the fear and mystery out of physics and made it fun. Mr. Allen guided me toward my love of science." Aaron wrote, "Mr. Allen is a large part of why so many people learn a subject as difficult as physics so painlessly. . .He is just plain good at his job, which is preparing the next generation of scientists. . .He has an ability to make physics seem logical to everyone, and yet to challenge even the most talented students." Harvest was also very appreciative, writing, "Mr. Allen shares his brilliance with his students and stays after school almost every day to help students at all levels of physics. . . We will go on to college and learn more advanced physics. . .but it was Mr. Allen who laid the rock-solid foundation on which all future lessons in physics will rest." Brighton High School Principal Mrs. Nancy Hackett added that Mr. Allen has done "a fabulous job" and that his "good energy" has dramatically improved the level of science education at Brighton High School.

Table 124.II: High School Students and Projects—Summer 2010.

Name	High School	Supervisor	Project Title
James Baase	Victor	D. J. Lonobile, G. Brent	Optimizing the Movement of a Precision Piezoelectric Target Positioner
Andrew Chun	Brighton	F. J. Marshall	X-Ray Imaging with Compact Kirkpatrick–Baez Microscopes
Robert Cooper	Allendale-Columbia	R. W. Kidder	Designing an Ontology for Experimental Diagnostics at LLE
Luke Coy	Greece Arcadia	R. Rombaut, R. S. Craxton	A Graphical User Interface for User-Generated Opacity Data
Kyra Horne	Fairport	M. J. Guardalben	Reducing UV Near-Field Beam Modulation on OMEGA EP by Angularly Detuning the Frequency Conversion Crystals
Karin Hsieh	Webster Schroeder	W. T. Shmayda	Modeling Water Desorption from Stainless Steel
Connie Jiang	Brighton	D. W. Jacobs-Perkins, R. Huff	Testing and Installation of the Reticle Projector on OMEGA's Target Viewing System
George Liu	Pittsford Sutherland	R. Epstein	Imploded Shell Parameter Estimation Based on Radiograph Analysis
Thomas Mo	Webster Schroeder	R. S. Craxton	X-Ray Backlighting of a Shock-Ignition Experiment on the NIF
Eric Pan	Webster Thomas	T. B. Jones	Using <i>Surface Evolver</i> Software to Model the Behavior of Liquid Deuterium
Ryan Shea	Fairport	W. T. Shmayda	Water Desorption from Stainless Steel at Variable Temperatures
Laura Tucker	Brighton	R. S. Craxton	A Design for a Shock-Ignition Experiment on the NIF Including 3-D Effects
Katherine Wegman	Pittsford Mendon	K. L. Marshall	Liquid Crystal Beam-Shaping Devices Incorporating Coumarin-Based Photoalignment Layers
Francis White	McQuaid	D. H. Edgell, M. D. Wittman	Determination and Correction of Optical Distortion in Cryogenic Target Characterization
Barry Xu	Brighton	S. X. Hu	Electron-Ion Relaxation Rates in Inertial Confinement Fusion
Andrew Yu	Pittsford Sutherland	K. L. Marshall	Modeling Absorption Spectra of Optically Switchable Azobenzenes