
LLE's Summer High School Research Program

During the summer of 2007, 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 experimental diagnostic development and analysis, computational modeling of implosion hydrodynamics and electron transport, database development, materials science, computational chemistry, and solid-state switch development (see Table 112.IV).

The students attended weekly seminars on technical topics associated with LLE's research. Topics this year included laser physics, fusion, holographic optics, fiber optics, liquid crystals, error analysis, and global warming. 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 29 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 Web site and bound into a permanent record of their work that can be cited in scientific publications.

Two hundred and eighteen high school students have now participated in the program since it began in 1989. This year's students were selected from approximately 50 applicants.

At the symposium it was announced that Mr. Christian Bieg, a physics teacher at Fairport High School, is the recipient of the 11th annual William D. Ryan Inspirational Teacher Award. 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. Bieg was nominated by Rui Wang, a participant in the 2006 Summer Program and a finalist in the 2007 Intel Science Talent Search. "I have moved around the globe during my years of primary and secondary education," Rui wrote in her nomination letter, "yet the teacher whose dedication to science and education has inspired me the most is Mr. Bieg ... Mr. Bieg was not only passionate about physics and teaching, but also knew exactly how to bring out the curious side in everyone ... He had promised us on the first day that we would never see the world the same way after each class, and, of course, he kept his promise." Mr. David Paddock, principal of Fairport High School, added, "Chris Bieg is an outstanding teacher ... He has the ability to make the subject interesting and fun to all students, even those who may not generally favor science. Chris ... serves as a wonderful role model for his students."

Table 112.IV: High School Students and Projects—Summer 2007.

Name	High School	Supervisor	Project Title
Joshua Bell	Churchville-Chili	W. R. Donaldson	Development of a GaAs Photoconductive Switch for the Magneto-Inertial Fusion Electrical Discharge System
Margaret Connolly	Mercy	T. C. Sangster, M. McCluskey, S. Roberts	Response of CR-39 to Heat Exposure
Juraj Culak	Brighton	P. B. Radha	Neutron Imaging of Inertial Confinement Fusion Implosions
Daniel Fleischer	Brighton	R. Boni, P. A. Jaanimagi	ROSS Performance Optimization
Jean Gan	Pittsford Sutherland	K. L. Marshall	Patterned Photoresist Spacers and Photo-Induced Alignment Coatings for Liquid Crystal Waveplates and Polarizers
Roy Hanna	Williamsville	J. A. Delettrez	Extension of the Modeling of Blooming and Straggling of the Electron Beam in the Fast-Ignition Scenario
Katherine Manfred	Fairport	R. S. Craxton	Polar-Direct-Drive Simulations for a Laser-Driven HYLIFE-II Fusion Reactor
Richard Marron	Allendale Columbia	R. Kidder	Creation of an Ontology for the OMEGA EP Laser System
Alan She	Pittsford Mendon	R. S. Craxton	Thermal Conductivity of Cryogenic Deuterium
Benjamin Smith	Webster Schroeder	L. M. Elasky	Expansion of Search Capabilities for the Target Fabrication Database
Alexander Tait	Allendale Columbia	W. A. Bittle	Data Analysis for Electro-Magnetic Pulse Measurements
Ernest Wang	Pittsford Mendon	K. L. Marshall	Computational Modeling of Spectral Properties of Azobenzene Derivatives
Eric Welch	Livonia	J. P. Knauer	Design of an X-Ray Photoconductive Device Spectrometer
Andrew Yang	Fairport	R. Epstein	Unfolding X-Ray Spectra from a Multichannel Spectrometer