

### **Three Rivers SPIE Chapter Members Report on Outreach to Area High Schools**

Students from Ella Grasso Regional Vocational Technical school (Groton, CT) were the guests of Three Rivers SPIE student chapter at the final meeting of the semester in December. The theme of the meeting was projects with neighboring high schools.

President Nate Caouette began the meeting with an account of the progress made so far by the subcommittee working the "Traveling Light Show" project. With support of a grant from SPIE, the chapter is creating a program to introduce middle and high school students to careers in Photonics using special effects and a laser video communication system. Nate also described a presentation made to the new optics club at Plainfield High School, where he told students about his summer internship experience at Zygo Corp, in Middlefield, CT.

The meeting was then turned over to the Grasso Tech students who have been working with Vice President Robert Bernier on laser project. Kurt Erikson presented several variations of a HeNe power supply built under Bernier's direction. The students illustrated the success of their project by powering one of the TRCC lab HeNe lasers.

According to Bernier, the students are planning additional experiments using their laser during the coming semester.



*Students from Grasso RVTS demonstrate their laser project for Three Rivers' SPIE chapter Vice President, Robert Bernier (second from left) and President, Nate Caouette (third from left). Grasso students are (from left) Stephen Sikorski, Dave Dones, and Kurt Ericson.*

The SPIE student chapter also sponsored two field trips during the fall semester. The annual Photonics Boston trip was capped by a tour of the MIT Media Lab, hosted by Dr. Stephen Benton, and a visit to the MIT Museum to view the holography collection. Wave optics students also had an insiders' tour of Zygo Corporation in Middlefield, CT.

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### **National Science Foundation Awards Three Rivers Grant for Advanced Lightwave Lab** *Second NSF Award to the Photonics Laboratory*

The National Science Foundation (NSF) has awarded Three Rivers Community College \$47000 to develop advanced laboratory for lightwave communications (fiber optics). College and industry equipment matches will result in \$72000 worth of new equipment for the lab. The grant, from NSF's Course Curriculum and Laboratory Improvement program, is the second received by the College's photonics program.

High speed optical fiber systems have revolutionized the telecommunications industry, resulting unprecedented demand for technicians with experience not only in fiber handling and installation but also in manufacturing and testing passive and active optical components with high end instrumentation. The recently funded project seeks to upgrade the current Lightwave Communication Laboratory by creating a hands-on curriculum that allows students to learn the use of important test and measurement equipment, and then to use the equipment to investigate various commercially important lasers and fiber optic devices and systems. The goal of the project is to produce a modern integrated laboratory/learning environment to study the theory and applications of modern fiber optic technology.

According to Principle Investigator Judy Donnelly, the project uses an interdisciplinary team of physics, mathematics and engineering technology faculty, which will ensure that sufficient attention is paid to basic physics principles and appropriate mathematics content. The addition of mathematics and physics faculty also encourages dialog between engineering technology and the arts and sciences, resulting in enrichment of the mathematics and physics curriculum through the addition of technology examples. Randy Seebeck of the Technology Department and Brian Kennedy of the Mathematics Department join Donnelly, who is a Professor of Physics, as the two Co-Principle Investigators on the project.

**Three Rivers Represented at Singapore Conference**

Judy Donnelly, Physics Professor, and Peg Stroup, Director of the Business and Industry Services Network, each presented a paper at the Seventh Conference on Education and Training in Optics and Photonics (ETOP) held November 27-30 in Singapore. Stroup reported on the 9.5 credit certificate program that was offered in the Spring of 2001 in Meriden, CT. The presentation highlighted the unique partnership formed to deliver the certificate courses, involving two community colleges (Three Rivers CC and Middlesex CC) and CiDRA, Corp., (Wallingford, CT).

Donnelly's paper summarized four National Science Foundation supported projects in New England that have Photonics as a major component. The main focus of the talk was PHOTON, a project of the New England Board of Higher Education to increase the number of photonics courses and programs in schools and colleges throughout New England. Donnelly is the Principle Investigator of the three year PHOTON project.

Donnelly also participated in a round table discussion on technician education, which was hosted by Dr. Chandra Roychoudhuri of the University of Connecticut. A dozen panelists from around the world provided a fascinating look at how the common problems of lack of curriculum materials and trained teachers are affecting programs in their countries. The isolation of individual programs and teachers was a common theme among participants, many of whom expressed a desire to form a global electronic network for photonics education.

The four day conference provided a unique opportunity to exchange ideas with an international group of colleagues with the common goal of promoting and improving photonics education.

**Three Rivers Develops Online Laboratory Course in Optics**

*Students invited to turn their kitchen tables into optics labs*

The second course of the Three Rivers distance learning Certificate in Fiber Optics Technology is now being offered by distance learning via the Internet. PHO 101 Photonics Concepts is being developed as a laboratory course offered totally by distance learning. The initial certificate course, PHO 121 Introduction to Fiber Optics, was offered in both Spring and Fall 2001.

Photonics Concepts introduces the ideas of geometric and wave optics in a down-to-earth style, requiring little math beyond high school algebra. Tutorials have been written to introduce and/or reinforce math and physics topics that may be unfamiliar to students for whom this is a first science or technology course.

Development of the new course involved writing a set of (printed) notes to cover the material offered online. In addition, assignment files on the course web site direct students to optics application web sites as well as interactive Java applets which allow students to simulate many optics phenomena. In addition to teaching the topics at hand, the course aims to expand students' understanding of the diverse applications of optics.

The most challenging part of course development was to create a set of "home labs" based on the Optical Society of America (OSA) Optics Discovery Kit. In addition to the kit, each student is required to purchase a laser pointer and small focusing flashlight. The remainder of the "lab equipment", including a metric ruler or tape measure and clothespins to form the "component supports" should be readily available around the home. For example, for the Snell's Law lab, students are directed to make slabs of stiff gelatin (more commonly known as Jello® Jigglers) and use the laser pointer to determine incident and refracted rays.

The online portion of the course may be sampled by visiting <http://www.bb1.ctdlc.org>, using the login name visitor, and the password guest.

**THANKS!**

Thanks to Zygo Corporation for an in-depth tour of their Middlefield, CT facility. Thanks also to Flemming Tinker of Zygo, TRCC Photonics Industry Advisory Committee member, for the donating beamsplitters and other optical components.

**PHOTONICS ENGINEERING TECHNOLOGY**



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