

Industry Pipeline

The Photonics Academy in Wales is planting seeds for the next crop of optics and photonics professionals.

By **Beth Kelley**



Ray Davies' passion for education outreach shows in his presentations to students using a number of optical devices.

The OpTIC Technium Photonics Academy in Wales is sowing the seeds for creativity and innovation in laser photonics and inspiring students of all ages to follow photonics as a career path.

The Academy is tackling the issues of how to get the next generation engaged in math and science and how to get students the hands-on training and education they need in order to succeed in college and in industry settings.

The Photonics Academy is an educational facility outside the traditional school system. Housed within the walls of OpTIC Technium, a government-funded optoelectronics incubation center in St. Asaph, Denbighshire, in north Wales, the Academy's mission is to assist current

and future employees and employers in the local photonics industry in developing the skills needed to work in the industry.

"We train and teach from the age of 3 years up to 83 years," says Brenda Hargreaves, Business Centre manager of OpTIC.

Outreach Efforts

The photonics academy concept in Wales was first spearheaded in 2004 by Alan Shore of Bangor University (Wales) to increase students' awareness about photonics, to ensure a regular influx of young people into the photonics industry, and to encourage an education pipeline all the way from kindergarten to working engineers.

Several initiatives were launched over the

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years, and when the Photonics Academy was created at OpTIC in 2007, many of its first programs were based on those early outreach efforts. They included a 1994 Laser Photonics Educational Initiative and the Laser Photonics Project Design Laboratory at the University of Salford (Greater Manchester, UK), both developed by SPIE Fellow Ray Davies. Davies joined the staff at OpTIC in 2006 to help develop a laser photonics facility and is now the Photonics Academy laser photonics investigative design mentor.

“The Photonics Academy at OpTIC now is developing further the unique approach to students that I have evolved over the last 14 years,” Davies says. It has “an entirely original and a sharply focused emphasis on student involvement within photonics, with a unique strategy and performance output all of its own.”

Davies works on course development for teachers, presentations for students, and runs the Laser Photonics Summer School for 17-year-olds. He coordinates work experience opportunities for both school- and home-educated students, among his many roles at the Academy.

Ages 5 and Up

One of the extremely successful outreach programs at the Academy is the MAGICAL Home project where students develop model homes that focus on the use and recycling of light. The homes use optics in automatic door openers, LED light sources, light switches, and solar panels that heat water. Students are divided into teams that are each given one aspect of the theoretical home to work on. Sometimes the project includes designing a working model of that home system.

“The MAGICAL Home project is aimed at primary school children age 5-11, and involves classes—or sometimes whole schools—in designing and modeling homes of the future using photonics concepts,” says Anne Stafford, who has spearheaded the solar outreach at the Photonics Academy. Stafford is the Academy’s solar specialist and a staff member of the Centre for Solar Energy Research (CSER), also housed in the OpTIC facility.

“When CSER was first established at OpTIC in March of this year, I began to collaborate with Ray Davies, initially as a technical adviser on PV. Soon, however, we both saw the greater potential of the collaboration,” Stafford says.

One of these collaborations was the MAGICAL Home project. Because of Stafford’s and Davies’ efforts, for the first time this year some student teams took on projects with a strong solar energy element. “In MAGICAL Home, this adds

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Optics Lock

A Photonics Academy student from 2007 created a 5-beam laser combination lock, which works in the same way as a standard mechanical lock but with lasers instead of clicks. Because Teleri Edwards' design could lead to one of the most secure locks ever invented, she won the honor of presenting her invention at The European Union Contest for Young Scientists in Copenhagen in September 2008.

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the extra dimension of engagement with sustainability issues to the program, which fits in very well with the new curriculum," Stafford says.

Local schools and programs have fully embraced working with the Academy and together have helped create new ideas and potential products.

Academy Seeks Funding

The Photonics Academy at OpTIC has applied for funding from the EU Framework 7 Programme, an ongoing initiative to promote European industry research and to help develop Europe's role as a world leader. The Academy hopes to use this funding to expand the MAGICAL Home program to other EU countries. This expansion will also provide the Academy with more opportunities to integrate businesses and student training.



Academy to Host ETOP 2009

The Photonics Academy is hosting the biennial Education and Training in Optics and Photonics (ETOP) conference 5-7 July, 2009. "We were eager to host this prestigious conference to share our experiences, best practices and offer an international forum to enable in depth knowledge transfer of photonics education worldwide," says Brenda Hargreaves, manager of the Business Centre at OpTIC. For more information on the 2009 conference, visit www.etop.org.uk

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