

NORTH PENN HIGH SCHOOL

Nanotechnology program gets a boost

Mark D. Marotta, The Reporter

North Penn High School teacher Michael Boyer has been recognized as one of the nation's most innovative educators, thanks to a nanotechnology program he has developed for students with an interest in engineering.

ING Group, a Dutch financial institution offering banking and other services to clients in more than 50 countries, recently announced that Boyer was one of 100 winners of its 2005 ING Unsung Heroes awards. Having received \$2,000 to implement his innovative ideas in the classroom, Boyer is eligible to receive one of three top prizes of up to \$25,000.

Nanotechnology "is working in the field of something very small," explained Boyer, 31, a technology education teacher at North Penn for the past 10 years.

The ING Group press release described nanotechnology as the science of using atoms and molecules to build devices. "It sounds science fiction, but it really isn't," said Boyer. By building materials atom by atom, he explained, it was possible to eliminate problems of stress and fatigue. "The research is limitless," Boyer said. The technology could be used in fields as diverse as the fight against cancer or developing bullet-proof wear, he said.

Boyer received his diploma from North Penn in 1992 and went on to earn a degree in technology education in 1996 from Millersville University. He is working on a master's degree in interdisciplinary studies from the Rochester Institute of Technology.

Three summers ago, Boyer signed up for a Drexel University program introducing teachers to research. That was when he was introduced to nanotechnology. Ever since, Boyer said, he has been looking for ways to get students involved.

This semester, his "The Future is NEAR (Nanotechnology Education and Research)" program is part of North Penn's Engineering Academy, a five-course sequence for students. Boyer said about 35 students will be participating. He said he hoped to eventually tie the nanotechnology program in with other courses he teaches and draw in more than 100 students.

According to the web site for The Future is NEAR, its mission "is to introduce the fundamentals of nanotechnology, research skills, and higher-level thinking and application of knowledge to high school students while cultivating their interest in engineering, problem solving and life-long learning."

"That's really the key part of this program," Boyer said. "My hope is the kids are going to find a new love."

Part of his job, Boyer said, is going to be to get students to recognize just how small things can be. Splitting a hair lengthwise 70,000 times would produce a 1-nanometer fiber, he explained. The students "are going to be measuring at that level," he said. Boyer said the students will use a plastic called polyethylene oxide to create superfine fibers, which they will weigh and measure, among other things. Along the way, the students will be touching on different fields of physics. He said he wants the students to gain "practical engineering experience" by developing and designing their own experiments.

In June, the school district announced that the high school had received a \$4,930 grant from the Toshiba America Foundation for the nanotechnology program.

Additionally, Boyer said, the Dominion Foundation had given a \$4,500 grant. "I couldn't do the program without it," Boyer said, adding that the money would pay for materials and equipment.

Boyer said Drexel had also been integral in supporting the nanotechnology program. He said the students would make field trips to the university to use its equipment. "A really strong collaboration is in the works," Boyer said.