

# UDRI electro-optics gives glimpse of future

*Program only one of its kind in state*

By DALE DEMPSEY

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**DAYTON** — Joe Haus thinks about optical “tweezers” that could someday pick out the smallest pieces of life in the growing science of biophotonics.

Phil Taylor is looking into ways to measure how much mercury coal-burning power plants emit into the air, a timely environmental topic after this week’s move by the Bush administration to change

how mercury will be regulated in the next decade.

Andrew Sarangan talks about putting tiny lenses on a computer pixel, which could one day be big business in the Miami Valley.

Haus and Sarangan are professors in the electro-optics program at the University of Dayton. Taylor is a researcher with the UD Research Institute, and is using electro-optic lasers techniques to measure mercury.

The electro-optics program at UD began 20 years ago with just a \$300,000 grant from an anonymous donor, but has grown into one of the premier optical

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## OPTICS

*UDRI program becomes one of best*

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engineering programs in the country. It is the only electro-optical program in Ohio and one of only six in the U.S.

The researchers and their graduate students work closely with Wright-Patterson Air Force Base and companies in the region in the field of nanotechnology. As a result, about 40 percent of the program’s graduates remain to work in the area, Haus said.

“That’s high for any program,” he said.

Nanotechnology — the prefix “nano” stands for one-billionth of a part of something — is simply an extension of the trend to miniaturization that started with the transistor and moved through the micro-technology of the 1960s and 70s.

“Even consumer items...are hitting nano scale,” Sarangan said.

Sarangan received \$773,000 from Gov. Bob Taft in June to build a nest — or Nanoscale Engineering Science and Technology center at UD.

The clean lab, which will be ready in the spring, will be used on a variety of the program’s projects, including a micro-lens

development that Sarangan is working on with CMC Cincinnati Electronics.

“There could be micro-lens spin-off businesses start up around here,” Sarangan said. “That is one of the long-term goals.”

Taylor has received a \$129,000 grant from the Ohio Coal Development Office to conduct an unprecedented study of mercury emissions.

Ohio ranks second only to Texas in the amount of mercury released into the air, of which power plants are the largest industrial source at 91,000 pounds a year. Every waterway in Ohio is under a fish consumption advisory for mercury contamination, according to a report by the Ohio Environmental Council that used the 2001 Toxic Release Inventory.

“No one has done this type of study at temperatures high enough to simulate coal combustion in a power plant,” Taylor said. “We have laser-based techniques to measure the mercury and ultimately determine how much gets into the air. Up until now, it has been a guess.”

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