

# Companies to Watch

## NPoint

[Private]

[www.npoint.com](http://www.npoint.com)

(608) 310-8770

Madison, Wisconsin

Chief Executive: John Biondi

What it does: Manufactures nanopositioning systems for nanotech tools.

In the auto industry, aftermarket tuner parts are hot. A new exhaust system, bigger brakes and wider tires can turn a run of the mill economy car into a tire-smoking hot rod. NPoint is hoping to do the same for hundreds of older nanoscopes across the county. It produces a new generation of nanopositioning systems, a crucial component in nanotech research tools like Atomic Force Microscopes (AFMs) and Scanning Electron Microscopes (SEMs).

Nanopositioning tools are used in AFMs to precisely and rapidly image, measure and manipulate items at the nanoscale. NPoint sells them to large metrology vendors like Veeco [VECO] and Nikon and to top research institutions including Lawrence Livermore National Laboratory, Berkeley and UCLA. Right now, almost all sales are to OEMs, but a retrofit kit designed for existing AFMs and SEMs is in the works for 2003. CEO John Biondi expects this new kit to account for 10% of sales next year.

"Our components allow researchers to operate at sub-molecular level, down to 1/10 of a nanometer," says Biondi. "Without them, customers would not be able to position nano-sized materials as accurately and scan images of them as rapidly." He says that the nanopositioning component is becoming a much higher percentage of the AFM's value, representing 10% of the cost for a Veeco AFM.

Formerly called Piezomax Technologies, NPoint was founded in 1997 by University of Wisconsin professor Max Lagally, an expert in surface and thin film material science and nanoscale instrumentation. The company has a total of six patents and patent applications.

NPoint produced the scan head for Veeco's new MultiMode PicoForce system; the first time Veeco has gone outside the company for significant component. Says Biondi, "AFM vendors had traditionally done scan heads on their own, but they all had difficulty getting down to sub-nanometer precision."

NPoint's nanopositioners range in price from \$10,000 to \$50,000. Around 70% of the company's sales are from industry (including semiconductor equipment and defense), while the remaining 30% is to the research market. NPoint started production last year and generated \$250,000 in revenues. Sales are expected to grow in excess of \$2 million in 2002, despite weakness in the semiconductor market.

The company's biggest competitor is Germany's Physik Instrumente, the market leader with a broad product catalog and a 70% share in ultra-precise nanopositioning market. However, NPoint claims its nanopositioning systems offer the highest resolution and the quickest response time of any currently available systems, including Physik's. Biondi points to the company's proximity to the U.S. instrumentation companies as another distinct advantage over its German competitor.

NPoint's funding came from Small Business Innovation Research (SBIR) grants: five Phase 1 and four Phase 2 SBIRs totaling \$3 million. In June, four Wisconsin angel investor groups infused an additional \$1.15 million in equity capital. With 14 full-time employees, NPoint is now looking to raise \$3 million to ramp up product development.

## Nanosonic

[Private]

[www.nanosonic.com](http://www.nanosonic.com)

(540) 953-1785

Blacksburg, Virginia

Chief Executive: Richard Claus

What it does: Produces coatings and thin film materials.

There must be something in the water at Virginia Tech. How else to explain the hotbed of nanotech entrepreneurship that has risen from southwestern Virginia? Blacksburg-based Luna Innovations (*see "Companies to Watch," May 2002*) used nanotechnology research developed at the university to spin off five companies. Now, Nanosonic is following Luna's lead, creating precisely controlled thin film materials and coatings through its proprietary self-assembly process.

It was spun off in 1998 from the research of Nanosonic president Richard Claus (a Luna co-founder) and Virginia Tech graduate student Yanjing Liu. Nanosonic currently has nine patents licensed from Virginia Tech and nine wholly owned provisional patent applications.

Nanosonic's patented ESA (electrostatic self-assembly) manufacturing process creates custom designed thin films. These films exhibit enhanced optical, electronic, magnetic, thermal and mechanical properties not available in bulk materials. The company believes its thin-film materials will ultimately be used in commercial products as diverse as window coatings, fuel cells, space structures, biomedical and electronic devices, and optical networking equipment. "We are looking into corrosion-resistant coatings for the aircraft and automotive industries for 2004-2007," according to Nanosonic's Dr. Marten de Vries.

Nanosonic currently has two undisclosed customers in the defense industry. It is also in advanced talks with a large multi-national materials company for a thin film polymer product for a consumer application, likely 3M [MMM], BASF [BF] or DuPont [DD].

The ESA process Nanosonic utilizes has many advantages over conventional fabrication processes. It can be done at room temperature and dramatically cuts costs because it requires little special equipment. And unlike other deposition techniques, ESA's uniform molecular layers (1-20nm thick) can coat complex shapes or ones filled with cavities. This is very valuable for products like microwave filters for wireless handsets where the filter's surface has many tiny holes.

Here's how it works. First, a material is treated to retain a specific charge. Then Nanosonic uses its own dipping machine to repeatedly submerge the material into baths with ions of alternating positive and negative charges. The oppositely charged particles attract and stick to one another and build nanometer layers of film. This is repeated until a multi-layered molecular coating with the desired thickness forms.

Competitors in molecular self-assembly include Molecular Electronics and Microcoating Technologies, although neither target the same broad industries as Nanosonic. The company is looking to license its process and manufacturing technology instead of trying to become yet another large scale materials manufacturer.

Most of Nanosonic's revenues are currently from government grants: it has garnered seven Phase 1 SBIR and two Phase 2 SBIR grants since its inception. The company has not raised nor is it seeking venture financing right now. But Nanosonic says it is looking to replicate Luna Innovations' model of spinning out different companies to focus on individual market opportunities. □