A WHOLE NEW LIGHT

U's work in nanotechnology attracts a start-up to St. Paul to work on lighting's next generation.

BY JIM McCARTNEY
Pioneer Press

If you're a start-up company looking to invent a better light bulb, what better place to move to than an incubator project called Menlo Park?

In January, InnovaLight, which is developing a product called "silicon nanocrystals," moved into Menlo Park, a St. Paul incubator for biotech and high-tech start-ups. The building's owner named the complex — an old crime lab on University Avenue — after the famous Menlo Park laboratory of Thomas Edison, the inventor of the light bulb.

"It's totally ironic," said Paul H. Thun, the chief executive of InnovaLight. "It never occurred to me until we moved in."

Rather, InnovaLight was attracted to the resources of the University of St. Paul, which has a national expertise in nanotechnology, or engineering at the molecular level, with spots called nanomaterials that are...
Nanotechnology

(continued)

measured in terms of billions of a meter. From common materials such as silicon — the basic substrate in ICs — perform differently when they break down into ultra-tiny pieces.

One of the hot fields of nanotech these days is developing a more efficient and environmentally friendly form of lighting. The common household incandescent light bulb is woefully inefficient, and the fluorescent tube used in the workplace poses a hazardous-waste problem because of its mercury content, Thork said. As a result, the U.S. Department of Energy is making a big push to get industries to come up with a better source of lighting, and a variety of companies are looking at opportunities there.

InnovateLight has eight employees at Menlo Park. It is looking for six more and expects to have 15 employees by year-end. The jobs come with attractive wages — about $60,000 a year — and there could be a lot more if the company can commercialize its discoveries, Thork said.

Thork's one reason Guy Fawcett will use InnovateLight's lab as the site to introduce a statewide entrepreneur competition this morning.

The story of why InnovateLight moved to St. Paul goes back two years. The company, working with researchers at the University of Texas in Austin, was having trouble developing an efficient process for making silicon nanoparticles.

Dick Sommerlad, assistant director of the office of business development at the University of Minnesota, said the company "asked if we had anyone here who had done work on spheres of silicon that were four nanometers or less.

In fact, the University of Minnesota and its Institute of Technology are world-renowned for research in nanoscale and engineered nanoparticles. That's more, it had just the right researchers, Uwe Kortehagen, a professor of mechanical engineering at the institute, Kortehagen contributed a key invention: a method of making the silicon spheres.

Thork said the nanoparticles must be from 1.5 to 3.5 nanometers in width, with the size determining the color emitted by the particles.

Thork also discovered that, largely because of the University of Minnesota's Twin Cities area has a wealth of qualified nanotechnology researchers, InnovateLight stood out. Thork said it had found it difficult to find employees around Austin and had to recruit from outside that area, adding to its expenses.

"The university of Minnesota has a rich talent base from which we can draw," Thork said. "On the particle side of nanotechnology, they are second to none." In addition, the company convinced St. Paul's bioscience zone and the city's eagerness to recruit them, said Alexander Wong, a partner in Apex Partners, a venture capital firm that is an investor in InnovateLight.

"Constitently, Apex is based in Menlo Park — the California town that is Minnesota's techho ice cream — Minneapolis and Rochester have them as well — help start-ups like InnovateLight by offering research and development and technology transfer credits and exemptions from a variety of state and local taxes, including sales taxes on purchases of equipment. InnovateLight also was attracted by the state's business climate with regard to developing high-tech companies, Thork said. And the rent at Menlo Park is right, too. The firm, which leases about 4,000 square feet of lab and office space, is paying, on a square foot basis, about a fourth of what it said in Texas.

InnovateLight hopes to introduce a new nanoscale form of lighting that could be used for cell phones and other high-tech displays. Later, it hopes to introduce higher-intensity lighting that can be used on eating panels, replacing fluorescent lights in office buildings. But InnovateLight faces intense competition from such powerhouses as Westinghouse, Philips Electronics, GE Electric as well as some smaller firms such as Kopin and Evident.

"All of them are working on using nanoparticles or quantum dot for LED (light-emitting diode) lighting," said Jack Ulrich, a Minneapolis-based nanotechnology consultant. Such companies typically have far more resources than does InnovateLight, Ulrich said.

As a result, InnovateLight might need larger partners to help bring its products to market. One Minnesota company that is focusing on nanotechnology, Maplewood-based SM Co., might end up being a good match for them, Ulrich said.

Aside from Apex Partners, venture capital firms such as ARCH,Kevin Rosen Fund and STARtech Early Ventures also funded InnovateLight. That could enable other opportunities for the nanotech firms in the Twin Cities, he said.

"We will continue to look for others to join in," Thork said. "We are happy that Optimax is an investor as well. They bring a lot of experience in this area and could mean thousands of jobs."