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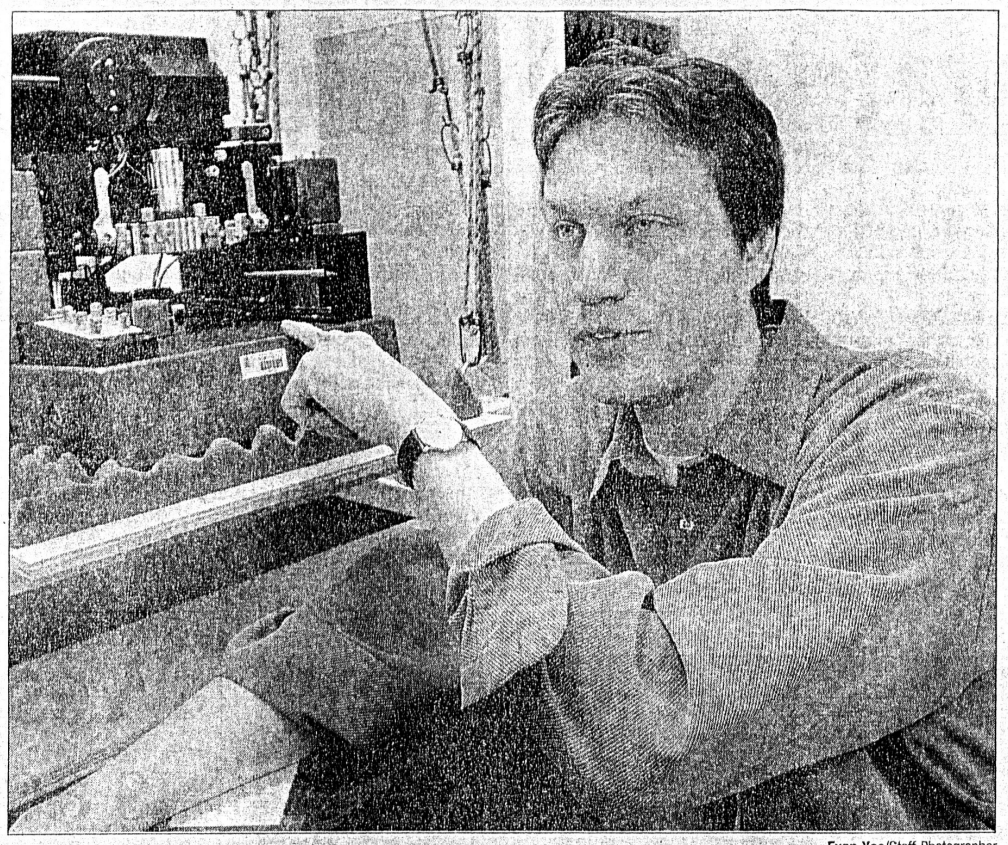


Evan Yee/Staff Photographer

Physicist Henk Postma of the Netherlands describes how the $120,000 atomic force microscope in CSUN's nanotechnology laboratory allows researchers to view transistors on a nano scale.

University's nanotech lab a big deal in small matter

SCIENCE: Department at CSUN campus is a major player in the study of atom-size transistors.

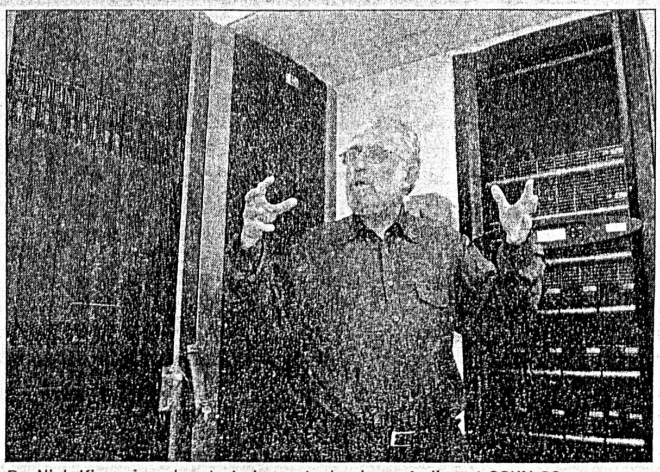
By Dana Bartholomew
Staff Writer

NORTHRIDGE — For CSUN physics students, there's something infinitely big taking place in pursuit of all things infinitesimally small.

In December, California State University, Northridge, certified its $600,000 nanotechnology lab headed by Caltech physics hotshot Henk Postma.

Its mission: to study transistors the size of a single atom and figure out a way to produce them cheaply.

"The most exciting part is this," said Postma, a 34-year-old native of the Netherlands, opening the door into his "clean room," where stu-



Dr. Nick Kioussis, who started nanotechnology studies at CSUN 20 years ago, can point with pride to $1.2 million in computing equipment used in the lab.

dents don sterile white suits to work with matter a billionth of a meter thick.

"The idea is, if you want to make things really small, you don't want them to be blocked by hair, skin, dust or dirt."

The basement lab – the most expensive single lab on campus – is actually the second Department of Science and Math nanotech lab.

Twenty years ago, CSUN professor Nick Kioussis started nanotech studies from scratch and went on to secure $10 million in grants for basic and applied research.

The result, in part, is the W.M. Keck Computational Materials Theory Center, the largest computer facility on campus, whose $1.2 million bank of computers can calculate the movements of a million atoms.

A typical home PC, in comparison, can track 20.

By computing multiscale models of nano-sized particles and speeds, researchers hope to strengthen steel for applications in turbo jet engines and the aeronautic, automobile and nuclear industries.

Nanotech researchers at CSUN partner with such national labs as Lawrence Livermore National Laboratory, Naval Research Laboratory and Los Alamos National Laboratory, in addition to working with such universities as UCLA, Harvard and Princeton.

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— HENK POSTMA

head of the CSUN nanotechnology lab, describing the "clean room" of the lab

"He's the man; he's brilliant," exclaimed Benjamin Ramirez, a UCLA doctoral student in mechanical engineering who drives to Northridge to study with Kioussis. "One of the best in his field."

But can Kioussis and his Northridge researchers track the number of angels dancing on the head of a pin?

"We started with large angels and started downsizing," joked Kioussis, a native of Ethiopia born of Greek parents. "The angels are basically nano."

"This is very interesting and exciting work, because we can go much deeper into the material science – the origin of all complicated phenomena," added Chen Zheng, a post-doctoral student from China. "This isn't angels, it's the real thing."

In the basement lab of a nearby science building, students drill holes in silicon 3 billionths of a meter wide in the humidity-controlled nanotech lab.

By using a $120,000 atomic force microscope suspended by a series of $1 bungee cords, they can see transistors on a nano scale.

"It's all like brand-new stuff," said Michael Dickson, 26, a graduate student who hopes to become a physics professor. "It's really cool to be in the lab."

Postma, for his part, said he chose CSUN because he loves to teach students who haven't been exposed to high technology.

His goal: to invent a way to produce budget atomic transistors – not in a pricey clean room, but in a common chemical beaker.

"In the beginning, anybody could make transistors in their garage," he said. "Now you need an extremely expensive lab. What I want to do is try to make transistors very cheaply.

"We're trying to change the world, one nanometer at a time."

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