

# CHRONICLE ONLINE

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## Cornell-developed exhibit at Disney's Epcot offers youngsters a window into too-small-to-see nano world

By Susan Lang

A world that is too small to see is going to seem a bit bigger when visitors get a chance to interact with, build, play and watch molecules in an interactive exhibit, "Too Small to See," which opens Nov. 18 at Epcot's Innoventions at Walt Disney World, Lake Buena Vista, Fla.

And in mid-May through fall 2007, the arcade-like, 5,000-square-foot museum exhibition, developed by a team led by Carl Batt, the Liberty Hyde Bailey Professor of Food Science at Cornell, will be at Ithaca's Sciencenter before traveling throughout the United States.

The exhibit, aimed at 8- to 13-year-olds, helps visitors view the world at the atomic scale and to better understand just how small a nanometer -- one billionth of a meter -- is (it is to a meter what 2.5 centimeters are to about two-thirds of the way around the Earth.)



Jon Reis

An Ithaca youth experiments with the magnification station of the "Too Small to See" exhibit.

To better understand these and other concepts, Epcot visitors can manipulate "atoms" on a vibrating table, magnify a computer chip up to 100,000 times and enter an interactive theater where they can see how on a projection screen their movements affect molecules around them. They can climb around carbon nanotubes, interact with a vibrating crystal and walk through an infinite crystal tunnel. They even can pick up and move atoms using a scaled-up version of the tool that was first employed by scientists at IBM to move atoms. A video that highlights the science behind moving atoms helps to inform visitors of the challenges of working at the nano scale.

"All things are made of atoms that are in constant motion, but pictures make it look like everything is frozen in place," said Batt, who directed the project with a \$1.8 million grant from the National Science Foundation (NSF). "We hope visitors to 'Too Small to See' will leave with the notion that everything is moving and at the nanometer scale, science is fun."

Batt said that the concepts that served as the basis for the development of the dozen or so interactive, hands-on experiences and video presentations are based on what visitors might already know about things on the

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nanometer scale.

For example, molecules are shown as the iconic "balls and sticks," a model that many visitors might recall from their chemistry lessons in school.

"From there you can build on a visitor's recognition of these models and let them experience science and technology at the atomic scale," said Batt. "Important recent discoveries in areas like carbon nanotubes and quantum dots then become more approachable. Everything returns to applications, where visitors can learn about why nanotechnology will be important in areas such as medicine, energy and information technology."

The exhibit is a collaboration of Cornell, the Ithaca Sciencenter and Painted Universe, a design/fabrication team in Ithaca.

This is the second time that Innoventions at Epcot has housed an exhibit on nanotechnology in collaboration with Batt and other Cornell scientists and supported by NSF. In 2004, "It's a Nano World," which was developed for 5- to 8-year-olds, was on display for six months; it is now in the third year of a national tour.

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