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## Minnesota scientists played big role in particle discovery

**TOM MAJESKI** STAFF WRITER

**T**he University of Minnesota's role in the international experiment to find concrete evidence of a basic building block of the universe underscores the school's stature as a major research institution.

"This is why we come to the University of Minnesota," said Roger Rusack, a professor of physics and team member. He was born in England and studied in Switzerland, New York and Chicago before joining the university's faculty in 1993.

Rusack and his colleagues from the university and fellow scientists from around the world designed the experiment to prove that a small subatomic particle, called a tau neutrino, exists.

The breakthrough, announced Thursday, was achieved by scientists at the Fermi National Accelerator Laboratory outside Chicago.

The particle represented the next to last piece of a complicated puzzle -- called the Standard Model -- that explains how the universe was formed and operates.

"The discovery is significant in that it says the way we think about matter in the universe is not totally wrong," said Kenneth Heller, a professor of physics and senior member of the university's team. "It would have been much more interesting if we hadn't found it.

"We were one of the biggest groups in the experiment."

The university's team built the device that held several tons of photographic plates in a precise position, was in charge of the large detectors that recorded the products of the particle collisions after they left the photographic film, and did a lot of the computer processing of the events that made up the experiment.

The last piece of the Standard Model puzzle is something called a Higgs boson, which is part of the origin of mass in the universe, Rusack said. Scientists will use a super-powerful accelerator now under construction on the French-Swiss border in Switzerland to prove that Higgs bosons exist.

Heller and his university colleagues also are involved in a project that is designed to show that neutrinos have mass. That experiment, which won't be ready until 2003, will involve shooting a beam of neutrinos through the Earth from the Fermi laboratory to the Tower-Soudan iron mine in northeastern Minnesota.

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