Former Physics Grad Student Wins Prestigious Thesis Award

COLLEGE STATION -- Peter Wagner, a former physics graduate student at Texas A&M University, has been selected as a co-recipient of the 2008 Universities Research Association (URA) Thesis Award honoring the top doctoral thesis in particle physics.

The prestigious prize, which includes a $3,500 monetary award and a certificate, is given annually in recognition of the most outstanding doctoral thesis written on research conducted at Fermi National Accelerator Laboratory (Fermilab) or in collaboration with Fermilab scientists.

Wagner, who earned his doctorate in physics from Texas A&M in May 2007, currently is a postdoctoral researcher in the Department of Physics and Astronomy at the University of Pennsylvania. His thesis, titled *Search for Heavy, Long-Lived Particles that Decay to Photons*, was supervised by Dr. David Toback, Thaman Professor for Undergraduate Teaching Excellence and associate professor of physics at Texas A&M.

Wagner's analysis focused on searching for a particle physics solution to the mysterious problem of dark matter, which accounts for about 22 percent of the Universe. His research included use of the Collider Detector at Fermilab (CDF), one of the two giant multipurpose experiments involving 750 scientists from around the world that currently is taking data at the high-energy frontier.

Toback says Wagner's work has enormous potential for theorists interested in explaining how the Universe began nearly 13.7 billion years ago with the Big Bang. If existing particle physics theories are correct, Toback explains, then enormous numbers of these particles would have been created in the Big Bang and lived for about a billionth of a second. Afterward they then would have decayed into the dark matter that we observe today in the Universe, which makes up more than 5 times the amount of normal matter that comprises stars, the Earth and people.

"This was a powerful new search, the first of its kind at the high-energy frontier," Toback notes. "Peter did an amazing job working on the theory, building the new equipment needed to do this search and then performing the world's most sensitive search in record time."

Toback adds that the project was largely done by Wagner, Toback and a single Texas A&M postdoctoral student, Dr. Max Goncharov -- now research faculty at Massachusetts Institute of Technology (MIT) -- further distinguishing it as an unusually large project for such a small team.

For the first time since the thesis award was established in 1997, the URA Thesis Committee chose two winners -- Wagner and Ryan Patterson, a former graduate student at Princeton University who is now at the California Institute of Technology (Caltech) -- citing especially strong competition as their reason. The two accepted their awards this past summer in conjunction with the annual Fermilab Users' Meeting.

"This year's selection was difficult," said Rick Tesarek, URA