

## **Alfred University physics professor receives National Science Foundation grant**

4/29/04

ALFRED -- Dr. Robert Holtzapple, assistant professor of physics at Alfred University, has been awarded a \$417,000 grant from the National Science Foundation. The five-year grant, awarded under the NSF Early Career Development Grant program, will run through the 2008-09 academic year. The funds will allow Holtzapple to build a beam dynamics laboratory at Cornell University that can be operated from the Alfred University campus. The beam dynamics laboratory will use the synchrotron radiation emitted by the electron and positron beams circulating near the speed of light around Cornell's Electron Positron Storage Ring to measure beam properties during collisions. The electrons and positrons emit synchrotron radiation when bent by the large storage ring bend magnets. By placing a mirror in the storage ring, an image of the electron or positron distribution can be determined from the synchrotron radiation emitted from the beam. The mirror reflects the synchrotron radiation out of the storage ring to an ultra-fast camera (gated camera) with a two-nanosecond shutter speed. The gated camera has the speed necessary to capture a picture of a single bunch distribution of electron or positrons circulating in the storage ring. In addition to building a beam dynamics laboratory at Cornell, Holtzapple's grant will set up a control laboratory in the AU science center, which will allow researchers at Alfred to operate the cameras at Cornell over the Internet. This will allow the measurements and data analysis to be conducted at a remote location. "The measurements will expand our knowledge of beam collision dynamics and incorporate the ability to operate fast imaging beam diagnostic equipment over the Internet from a remote location," Holtzapple said. "It will be almost like having our own (accelerator) facility on campus," Holtzapple added. "The benefit to our students is they can participate in the studies at a major research institution like Cornell." AU undergraduates in physics will participate in grant-funded research projects, working in Alfred's lab during the school year and at Cornell during the summer. Holtzapple added that he hopes the project will lead to development of new courses in physics at Alfred University, including one in particle beam dynamics. "Initially, we want to measure beam size, but hope to continue developing other beam properties as well," Holtzapple commented. The project at Alfred will demonstrate the ability to conduct research and run diagnostic equipment from remote locations. Researchers at other institutions throughout the United States and around the world may use the project's findings to determine if they, too, can conduct research on particle accelerators from remote locations. National Science Foundation Career Grants are extremely competitive. Holtzapple was one of a few assistant professors in physics to receive a grant award this year. Holtzapple earned a bachelor's degree in physics from the University of California at Berkeley in 1988 and went on to earn a master's degree (1992) and Ph.D. (1996) from Stanford University. After post-doctorate work at Cornell, he served as a staff scientist at Stanford before his appointment as assistant professor of physics at Alfred University in the summer of 2002.