Department of Physics & Astronomy

PHYSICS NEWS FLASH

UT Physicists Part of PHENIX Publishing Success

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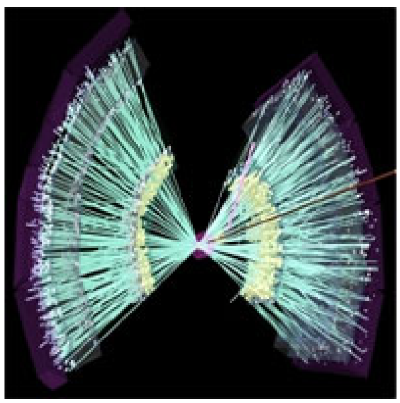

Gold-gold collisions from PHENIX

For 15 years, Ken Read and Soren Sorensen have sacrificed countless hours to PHENIX, a huge experiment designed to shed light on the miniscule. Now that work is paying off. The PHENIX experiment published three papers in the January 26 online edition of *Physics Review Letters*, an authoritative journal on recent and significant developments in physics research. Dr. Read and Dr. Sorensen are among the authors on all three, as are Associate Professor Yuri Efremenko, Ph.D. graduates Andy Glenn and Jason Newby, and physics alumnus Glenn Young of Oak Ridge National Laboratory.

Two of the papers discuss key measurements of electrons; the first dealing with electrons produced during proton-proton collisons and the second with those resulting from gold-gold collisions. The third paper measures the "flow" of the pi-zero meson, a particle created during collisions at the Relativistic Heavy Ion Collider (RHIC). All three papers offer insight into how quarks--the basic building block of all matter--are produced, and what their properties are.

PHENIX, the Pioneering High Energy Nuclear Interaction eXperiment, is one of four experiments at RHIC, which is part of Brookhaven National Laboratory. This powerful collider drives two beams of gold ions head-on in a subatomic collision, just slightly slower than the speed of light. Of the roughly 5,000 particles produced, about 10 percent will go through the PHENIX detectors. Sophisticated electronics rapidly decide which of the collisions are interesting enough to register. Those that make the cut are recorded as "events" and become part of a data collection that breaks them down by particle type, momentum, energy charge, etc. The primary goal of PHENIX is to discover and study exactly what state of matter existed right after the Big Bang. RHIC scientists believe that a liquidy quark-gluon mix may be the answer. This was one of the American Physical Society's top physics stories of 2005. This work supports another of the experiment's scientific missions: to study the most basic building blocks of nature and the forces that govern them.