

U.S. Department of Energy  
Carlsbad Field Office  
Waste Isolation Pilot Plant  
P.O. Box 3090  
Carlsbad, New Mexico 88221

# DOENews

## Media Contact:

Dennis Hurtt  
U.S. DOE Carlsbad Field Office  
(505) 234-7327  
Dennis.hurtt@wipp.ws

<http://www.wipp.energy.gov>

## For Immediate Release

### **EXO project equipment successfully placed underground at WIPP**

**Carlsbad, NM July 24, 2007** – The first two clean room modules for the Enriched Xenon Observatory (EXO) project have been successfully placed in the U.S. Department of Energy's (DOE) Waste Isolation Pilot Plant (WIPP) mine 2,150 feet below the earth's surface.

The two modules, weighing 13,000 and 15,500 pounds, were lowered into the mine by hoist and then transported through almost a kilometer of tunnels to the North Experimental Area with a 41-ton forklift.

DOE made WIPP's unique underground facility available to the scientific community to promote and foster scientific research. The depth of the WIPP facility provides shielding from cosmic rays and naturally occurring radiation on the earth's surface, making it an ideal location for the EXO project.

"The WIPP facility staff is pleased and proud to be a part of this far-reaching scientific initiative," said Dr. David Moody, manager of the DOE's Carlsbad Field Office. "We're looking forward to working cooperatively with EXO scientists to make sure the project is successful."

EXO is part of an effort by a consortium of scientists, led by Stanford University, to detect neutrinoless double beta decay, an extraordinarily rare nuclear process that occurs when disintegration of a nucleus is accompanied by emission of two electrons without any associated

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anti-neutrinos. If observed, this never-before-seen process could unlock secrets about the origins of matter and anti-matter, and how mass is distributed in the universe.

Normal beta decay involves a nucleus of an atom that emits an electron and antineutrino simultaneously. If detected, the rate of double beta decay can be used to measure the mass of the electron antineutrino. The information gathered from this observatory could revolutionize current concepts about physics and cosmology.

“If EXO confirms neutrinoless double beta decay, a Nobel prize in physics is virtually certain,” said Roger Nelson, Chief Scientist for WIPP, who has been working with the EXO Collaboration to bring the experiment to Carlsbad since 2001.

EXO will consist of six modules that connect together to form a clean room. The first module is equipped with an air-shower and changing area. From there, each module produces a cleaner atmosphere that progresses to the sixth and final module, which houses the detector. The detector has a special cryogenic chamber with rare enriched Xenon gas that will be used to observe and measure this nuclear process.

The first of three shipments from Stanford University arrived at WIPP on July 9. Additional shipments are planned to take place in the near future.

EXO will be located far from the transuranic waste disposal area of the mine. The project will have minimal impact on normal operations and will not interfere with WIPP’s mission of safely isolating transuranic (TRU) waste from people and the environment.

TRU waste is defense-related transuranic radioactive material left from the research and production of nuclear weapons. Waste that is temporarily stored at sites around the country is shipped to WIPP and permanently disposed in rooms mined out of an ancient salt formation 2,150 feet below the surface. WIPP, which began waste disposal operations in March 1999, is located 26 miles outside of Carlsbad, NM.