LEPP JOURNAL CLUB

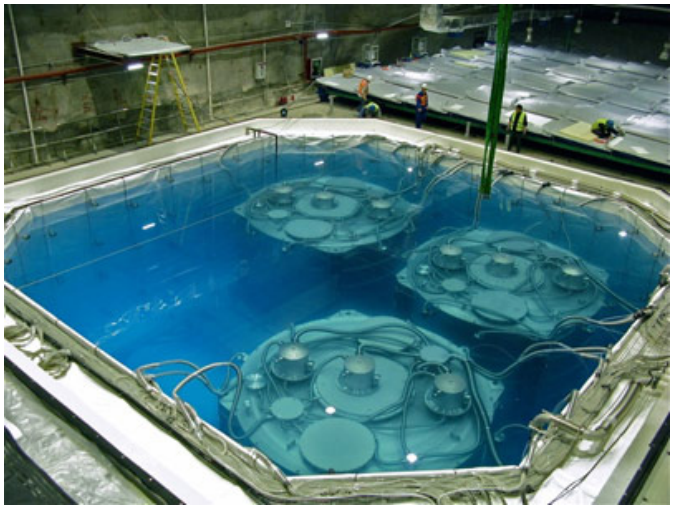
Jim Napolitano

Rensselaer Polytechnic Institute

Discovery of Reactor Antineutrino Disappearance at Daya Bay

Over the past decade, terrestrial experiments have proven that neutrino oscillations explain the solar neutrino problem and the atmospheric neutrino anomaly. These phenomena rely on neutrino mixing between the first and second, and second and third, neutrino generations, respectively. However, other experiments put limits on mixing between the first and third generations, and suggested a rather small mixing angle θ_{13}. Knowledge of this mixing angle is critical if we are ever to use leptogenesis to explain the baryon asymmetry of the Universe.

The Daya Bay Reactor Neutrino Experiment has recently made a conclusive measurement of θ_{13}, and the value turns out to be larger than most anyone expected. We will discuss some of the recent experimental history concerning this mixing angle, and the Daya Bay experiment in detail. We will conclude with potential consequences for the next generation of neutrino experiments, in the US and abroad.



Friday

April 20, 4:00pm

301 Physical Sciences Building

(Refreshments, 3:45pm)

LEPP, the Cornell University Laboratory for Elementary-Particle Physics, has joined with CHESS to become the Cornell Laboratory for Accelerator-based Sciences and Education (CLASSE). LEPP's primary source of support is the National Science Foundation.