

LABORATORI NAZIONALI DEL GRAN SASSO

SEMINAR ANNOUNCEMENT

On **July 4, 2007** at **14:30**, **A. Pocar** from **Stanford University** will give a seminar entitled:

“The Enriched Xenon Observatory for Double Beta Decay”

Abstract:

The Enriched Xenon Observatory (EXO) is a project aiming at detecting neutrinoless double beta decays of ^{136}Xe . A xenon-filled time projection chamber (TPC) supplemented with scintillation light readout detects ionising particle interactions within its volume. When candidate events are recorded, the ^{136}Ba ion daughters will be identified, event by event, by means of optical spectroscopy. This coincidence technique would allow for a measurement of double beta decays virtually immune to external radioactive contaminations. The EXO collaboration is planning on combining these experimental techniques in a ton-scale Xe detector using a phased approach. A smaller detector, EXO-200, employing 200 kg of enriched xenon (80% ^{136}Xe) in liquid form within a TPC with scintillation readout and with no Ba identification, is in advanced stage of assembly. Its cryogenic and xenon handling systems have been commissioned at Stanford, and are being shipped to the Waste Isolation Pilot Plant (WIPP) in New Mexico in early July 2007. The central detector is planned to be installed later in the year. As a parallel effort to EXO-200, strategies for Ba tagging are being developed in the laboratory. I will present the EXO experiment in the context of neutrinoless double beta decay searches and describe the EXO-200 detector in detail, discussing its physics goals, experimental challenges, and schedule. I will also illustrate some of the most promising approaches for tagging single Ba ions produced in a ton-scale Xe detector, show milestone results achieved in laboratory setups, and discuss the EXO timeline for the near future.

(“Segre” room)