

LABORATORI NAZIONALI DEL GRAN SASSO

SEMINAR ANNOUNCEMENT

Yuri Kamyshev
(University of Tennessee)

***Matter-antimatter
transformation via
neutron-antineutron
oscillation: status review
and new searches with cold
neutrons***

Observation of violation of baryon number B is a crucial component for understanding of matter-antimatter asymmetry of the universe and the physics beyond the Standard Model. One perspective experimental approach for detection of baryon number violation is a search for matter to antimatter transformation using neutrons ($\Delta B=2$). I will review and comment on the interpretation of recent N - N bar search results from Super-K and SNO; on unsatisfactory theoretical situation with the estimate of the intranuclear suppression of NN bar, and on advantages of NN bar search with free neutrons in vacuum. In particular, I will discuss a recent proposal to use a dedicated source of Very Cold Neutrons that can be built with Project X spallation target at Fermilab. In the new experiment the sensitivity of N - N bar search can be increased from the present limits by 3 orders of magnitude. Due to the unique signature of the antineutron annihilation, in a backgroundless detector one observed event can be a discovery.

MAY 17, 2012 – 2:30 PM
LNGS - “B. PONTECORVO” ROOM