

LABORATORI NAZIONALI DEL GRAN SASSO

SEMINAR ANNOUNCEMENT

On February 8, 2007 at 14:30, A.P.Serebrov from Petersburg Nuclear Physics Institute (PNPI), Gatchina, Russia will give a seminar entitled:

Fundamental Physics with Ultra-cold Neutrons

Abstract:

Ultra-cold neutrons (UCN) are reflected from substance at any angles of incidence and they can be stored in traps during a few hundred seconds. UCN are a remarkable instrument for carrying out precise experiments and studies of the fundamental questions of the elementary particle physics. The results of the experiments of PNPI search for the electric dipole moment of neutron as well as the prospects for increasing the accuracy of the measurements to check the predictions of SUSY models with CP-violation at the level of $10^{-27} - 10^{-28}$ e·cm will be discussed. The second part of the talk will be devoted to the recent PNPI-JINR result of the neutron lifetime measurement with a gravitational trap of UCN ($878,5 \pm 0,8$ s). The talk covers: 1) the present situation with neutron lifetime measurements, 2) the data analysis of lifetime and asymmetry of neutron decay from the point of view of possible deviations from the Standard Model, 3) the question about influence of new neutron lifetime on the He abundance and the baryon asymmetry of Universe in the model of Big Bang Nucleosynthesis. In conclusion the possibility of the UCN application for the experimental search for the neutron-antineutron and neutron-mirror-neutron oscillations will be discussed.

(“B. Pontecorvo” room)