**Istituto Nazionale di Fisica Nucleare Laboratori Nazionali di Frascati**

Avviso di Seminario Generale

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**The muEDM experiment at PSI**

Electric dipole moments (EDMs) of elementary particles violate time-reversal symmetry. According to the CPT theorem, this also implies the violation of combined charge-conjugation and parity-inversion (CP) symmetry, making EDMs powerful tools for probing physics beyond the current Standard Model (SM) of particle physics.

The muEDM experiment aims at setting the ground for a new direct electric dipole moment (EDM) search using muons.

The experiment will perform this dedicated search using the frozen-spin technique for the first time worldwide, aiming at improving the current sensitivity by more than three orders of magnitude to better than 6 × 10−23 e cm, an astonishing jump.

This search is a unique opportunity to probe previously uncharted territory and to test theories Behind Standard Model physics.

The experiment will be performed in two phases.

Phase I: In this exploratory phase, we will set up an experiment to demonstrate the frozen-spin method and search for a muon EDM using an existing solenoid. The instrument will be connected to a surface-muon beamline at PSI, delivering about 4e6 s−1 muons with a momentum of p=28 MeV/c. Although the sensitivity to a muon EDM will be sufficient to improve the current best measurement, the main purpose is to establish all necessary techniques and methods for a measurement with the highest possible sensitivity.

Phase II: The future instrument will use a dedicated magnet with minimal field gradient between injection and storage region to increase the acceptance phase space and integrate all lessons learned from Phase I. In addition, it will benefit from being coupled to the highest-intensity muon beam at PSI, with more than 1e8 s−1 muons with a momentum of p=125 MeV/c.

In this seminar we will review the motivation to search for EDMs and the current status of the muEDM experiment at PSI.

## Svolgimento Seminario

## Giovedì 8/5 ore 14:30 Aula Salvini

https://agenda.infn.it/event/46787/

L'invito è esteso a tutto il personale interessato, che è caldamente invitato a partecipare.