



Physics Department seminar
DIPARTIMENTO DI FISICA, VIA CELORIA 16, MILANO

Aula Bonetti VIRTUALE
<https://zoom.us/my/aula.bonetti>

22 Febbraio 2021 – 14:00

STÉPHANIE ROCCIA

Université Grenoble Alpes
Laboratoire de Physique Subatomique et de Cosmologie
Institut Laue Langevin (ILL), Grenoble

Probing fundamental symmetries with ultra-cold neutrons: the measurement of the neutron electric dipole moment at PSI

Experiments searching for a permanent electric dipole moment of the neutron (nEDM) aim at discovering new sources of CP violation beyond the Standard Model of particle physics and understanding the origin of the matter-antimatter asymmetry of the Universe. So far, no evidence for such an intrinsic property was observed, neither for the neutron nor for any other system.

The quest for the neutron electric dipole moment (neutron EDM) started more than sixty years ago. In recent experiments, polarized ultra-cold neutrons are stored in material bottles, subject to a strong electric field and a weak uniform magnetic field. I will discuss some of the most recent developments and their impact on both the sensitivity and the control of the systematic effects. I will give you an outlook on the key aspects of such a high accuracy experiment.

I will present the latest measurement to date*, more than a decade after the former one, established by a collaboration of 15 institutions at the Paul Scherrer Institute in Switzerland. This measurement provides the best limit on the neutron EDM and demonstrates how systematic effects can be overcome, paving the way for a new generation of experiments.

* *C. Abel et al., Phys. Rev. Lett. 124, 081803 (2020)*



Students are cordially invited – Contact silvia.leoni@mi.infn.it