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

Avviso di Seminario Generale

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**X-ray polarization from astrophysical sources. Current status and future prospects with HypeX project**

X-ray polarimetry is an observational technique with the potential to enrich our understanding of high-energy astrophysics by enabling the measurement of the polarization of X-rays emitted by exotic cosmic phenomena such as black holes, neutron stars, Gamma-Ray Bursts and more. This technique provides crucial insights into the magnetic field geometries and intensities, and emission mechanisms of these sources, offering valuable information that could improve the current knowledge of these astrophysical objects significantly. Currently, the IXPE space observatory, which features a photoelectric polarimeter with an active volume of 6.75 cm3, is the only instrument providing X-ray polarimetric measurements. The PRIN project "HypeX: High Yield Polarimetry Experiment in X-rays", developed by a collaboration of GSSI, INFN and INAF researchers, aims to apply more modern experimental techniques for applications in X-ray polarization measurements in the energy range between 10 and 40 keV. One branch of the project, GPD3D, builds on the IXPE detector concept, a Time Projection Chamber (TPC) with GEM-based amplification stage. The goal is to achieve 3D track reconstruction and better polarimetric performances by employing more advanced readout and amplification systems, namely an InGrid structure readout by TimePix3 chip. On the other hand, the Xray-CMOS subproject inherits the knowhow and detector concept from the CYGNO/INITIUM directional dark matter experiment optimizing it to this physics search. The technology, a TPC with triple-GEM amplification stage and optical readout exploiting the sensitivity and granularity of sCMOS cameras and PMTs, aims to achieve 3D reconstruction and an active volume significantly larger— about 100 times—than the current state of the art. I will present the status of the project in the physics context and the results of recent experimental tests carried out with a Xray-CMOS prototype in collaboration with INAF-IAPS laboratories, where we achieved angular resolution below 20 degrees on electron recoil tracks above 20 keV.

## Svolgimento Seminario

## Martedi’ 18/2 ore 14:30 Aula Salvini

https://agenda.infn.it/event/45029/

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