UNIVERSITÀ DI TRENTO
Dipartimento di Fisica

PhD Program in Space Science and Technology - SST

Silicon Photomultipliers for space applications: limits, challenges, and future development directions

Specific Seminar – Curriculum 5

May 6, 2026, 3 p.m.

Speaker:
Dr. Maria Stella Ruzzarin - Fondazione Bruno Kessler - FBK

Abstract:

Silicon Photomultipliers (SiPMs) are compact, high-gain solid-state photodetectors that are increasingly considered for space-based applications. SiPM technology has already been used in several fields, including medical imaging, high-energy physics experiments, LiDAR, and Cherenkov radiation detection. Their key advantages—low operating voltage, insensitivity to magnetic fields, mechanical robustness, and relatively low cost—make them attractive alternatives to traditional photomultiplier tubes (PMTs) and highly promising for space missions.

However, SiPMs also have limitations, especially in space environments: when exposed to significant radiation doses, a deterioration of their properties is observed, which can compromise the success of the experiment. This seminar will introduce the basic working principles of SiPMs and explain how radiation in space can affect their key characteristics. We will discuss the main challenges researchers face when using SiPMs in space, and we will explore current research directions.

Online attendance:

Information on remote participation can be requested by sending an e-mail to dn_sst@unitn.it

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