



University of Pavia

**Ph.D. School in Electronics, Computer Science and Electrical Engineering
Ph.D. School in Microelectronics
National Ph.D School in Micro- and Nano-Electronics**

SiPM-Based Readout of LaBr₃ Scintillators: Development and Characterization of State-of-the-Art Spectroscopy Detectors

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Aula 4, Nuovo Polo Didattico**

Abstract: Gamma radiation and its detection play a key role in many fields, from science (nuclear physics, astronomy) to medicine (for both treatment and diagnostics), passing through the food industry (to sterilize food), the oil industry (for well logging), and the nuclear industry (for both safety and security). In the context of gamma radiation detection, high-resolution gamma-ray spectroscopy, is concerned with the identification of the different energies of which the gamma radiation is composed by quantifying them with high precision. This presentation illustrates the design and experimental characterization of a high-resolution, high-dynamic-range gamma-ray spectrometer for nuclear physics experiments based on a lanthanum bromide scintillation crystal coupled with SiPMs, developed in collaboration with the Istituto Nazionale di Fisica Nucleare (INFN) - Sezione di Milano. The system, named GAMMA, achieved unprecedented performances in energy resolution, energy dynamic range and imaging capability, all three combined for the first time. GAMMA has also been the starting point for the development of smaller (and eventually more affordable) detectors for gamma-ray spectroscopy in fields other than nuclear physics, where gamma spectroscopy is crucial. In particular, nuclear medicine and nuclear security issues have been tackled with dedicated detectors.

Organizer

Prof. Lodovico Ratti

Ph.D. Coordinators

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The seminar will take place in English.
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