University of Pavia

Ph.D. School in Electronics, Computer Science and Electrical Engineering
Ph.D. School in Microelectronics

High Electronic Density for High Spatial Resolution Positron Tomography Dedicated to Preclinical and Brain Imaging

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Zoom platform, (https://us02web.zoom.us/j/86328516615)

Abstract: Improvements in timing and spatial resolutions both contribute to high contrast to noise ratio in PET images. However, current timing performance is not yet sufficient to fully improve image quality of preclinical scanners where fewer than 30 ps must be reached for mice. Improving spatial resolution becomes then the best option but comes with challenges regarding the pixel and electronic density along with heat dissipation problems. This talk presents the evolution of two avalanche photodiode-based technologies that successfully improved the spatial resolution from 4 mm to 0.78 mm over almost two decades. Trade-offs between sensitivity, spatial resolution, electronic performance, image quality along with industrial manufacturability are presented. ASIC integration, cooling approaches, EMI susceptibility along with the capability to build an Ultra-High Resolution (UHR) brain PET scanner supporting 129 024 pixels on a 39 cm diameter scanner will close the presentation with an opening on next steps to include ultrafast time-of-flight PET measurements in preclinical and brain scanners.

Organizer

Prof. Lodovico Ratti

Ph.D. Coordinators

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The seminar will take place in English
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