

University of Rochester
Department of Electrical and Computer Engineering Colloquia Series

Wave-Guiding Nanomaterials: a Path towards Ultrafast Efficient Scintillation Detectors

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Wednesday, February 28th
12:00PM – 1:00PM
Wegmans Hall 1400

Abstract: One of the novel applications of molecular beam epitaxy is the technology of wave-guiding nanomaterials with engineered luminescence centers (quantum dots - QDs) embedded into a semiconductor waveguide. This type of structures can be designed to enable ultrafast down-conversion/scintillation detection of single x-ray photons and energetic particles. X-ray detection with a picosecond time resolution is essential for low-dose x-ray 3D medical imaging, such as computer or positron-emission tomography, for improving spectroscopic accuracy and turnaround time in nuclear security, and for improvement of particle identification capabilities in high-energy physics. The talk will cover physics and technology of the InAs/GaAs QD scintillation medium, integrated photodetector, and recent results of the properties of the QD wave-guiding nanomaterial, being the fastest scintillation medium.

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