

**University of Rochester**  
**Department of Electrical and Computer Engineering Colloquia Series**

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

**Serge Oktyabrsky**  
**SUNY Polytechnic Institute, Albany, NY**

**Wednesday, February 28<sup>th</sup>**  
**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.

Bio: Dr. S. Oktyabrsky has received his Ph.D. degree in Solid State Physics from Lebedev Physics Institute, Moscow, Russia, in 1988. He joined the University at Albany – SUNY in 1998, and is currently a Professor and a leader of a compound semiconductor team at the College of Nanoscale Science and Engineering which is now a part of the SUNY Polytechnic Institute. His primary expertise is in the MBE technology, semiconductor materials and devices; he authored over 250 papers in these fields. His recent research focuses on quantum confined structures, photonic devices, group III-arsenide/antimonide MOSFETs.

Pizza and soda provided

