Physics AT QUEENS COLLEGE

Colloquium Notice

Sergey Polyakov

National Institute of Science and Technology

The World Where Every Photon Counts

Photon counting opens a door into a new world. Quantum effects emerge. Beyond fundamental interest, those effects lead to unprecedented accuracy in measuring light, often surpassing the capabilities of classical sensors. Quantum-enabled photonic techniques can enhance nearly every traditional application in optics: from astronomy to biology and from communications to imaging. I will talk about our recent experiments with faint light that enable practical quantum advantage by demonstrating below-the-shot-noise sensitivity and super-resolution. Let me show you a new world that connects fundamental laws of nature with everyday optical technologies.

Bio: Dr. Sergey V. Polyakov is the Chief of the Quantum Measurement Division, Physical Measurement Laboratory at NIST. He oversees the broad spectrum of research projects, from fundamental and applied quantum information science to the identification and dissemination of fundamental physical constants and units that form the international measurement system (also known as Système international d'unités, or *SI*). His own research aims to develop quantum methods for characterizing faint light. Sergey contributed to early research efforts in quantum repeaters. He developed innovative methods of single-photon source characterization that led to in situ, non-invasive measurement of the underlying physics of single-photon emitters. He holds the world record in the verification of the accuracy of single-photon detector calibration. Recently, he invented and developed a new class of optical receivers for classical communications that use quantum measurement. Sergey is a Fellow of the Optical Society of America and has served as a General Chair of CLEO (2021), and Nonlinear Photonics topical meeting (2022).

Monday
October 5, 2026
Starts at 12:15 PM
Coffee at 12:00 PM
Physics Conference Room, SB B326