The Center for Detectors presents a talk in the Detector Virtual Workshop

Superconducting Single-Photon Detectors

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Monday, Nov 14, 2011, 12:30 pm – 1:30 pm, Innovation Center, Room 1600
Cookies & Coffee at 12:00 pm
Presentation will be broadcast at: https://connect.rit.edu/dvw

Abstract

Superconducting nanowire single-photon detectors are promising candidates for single-photon detection systems that require high efficiency, low noise, good timing accuracy, and sensitivity across a wide range of optical wavelengths. They may enable applications in quantum optics, laser radar, space communications, and integrated-circuit evaluation. However, these detectors also have interesting electrical, thermal, and optical properties at the nanoscale that influence their performance, and can be exploited to improve the device efficiency, particularly in the infrared. In this seminar, we will describe the device operation, what we know of the device physics, and describe how these devices can be used in applications. Examples will include a variant of a new device architecture that provides improved infrared sensitivity and readout signal to noise ratio, as well as a nano-antenna design that enhances the optical absorptance of the device.

About the Speaker

Prof. Karl K. Berggren is an Associate Professor of Electrical Engineering in MIT's Department of Electrical Engineering and Computer Science, and is Director of the NanoStructures Laboratory, Associate Director of the Microsystems Technology Laboratory, and a member of the Research Laboratory of Electronics. From 1996 to 2003, Dr. Berggren was a member of the MIT Lincoln Laboratory technical staff, performing research on nanofabrication methods applied to superconductive classical and quantum (i.e. quantum computing) electronics. Since joining the faculty at MIT, Professor Berggren's research interests have centered on the application of new nanofabrication technology to superconducting single-photon detectors. He has expanded these detectors to include the capacity for photon-number resolution, and integrated the devices by using nano-optical techniques. His research includes the physics, electronics, optics, and fabrication of these devices, and includes work on applications of the devices to both quantum and classical communications.

About the Detector Virtual Workshop

The Detector Virtual Workshop is a year-long NSF-funded program dedicated to the advancement of UV/O/IR detectors. It brings together people from around the world to discuss detector technologies. For more information, visit http://ridl.cfd.rit.edu/ and click on the DVW tab.