



Münchner Physik- Kolloquium

Winter
2019/20

Hacking the superconducting nanowire: From photodetection to microwave plasmonics

Prof. Dr. Karl K. Berggren, *Massachusetts Institute of Technology, Cambridge, USA*

Monday, 11 November 2019, 17:15 h

Hörsaal 2, Physik-Department der TUM, James-Franck-Straße 1, Garching

Superconducting nanowires have long been of use in single-photon detection for applications in quantum information science. However, only recently have we begun to study them as a unique platform for examining how systems with low electronic carrier densities behave. In this regime, kinetic inductance (the inductance associated with inertial motion of charge carriers) dominates over conventional magnetic inductance. As a result, devices can exhibit ultralow phase velocities in the microwave spectral region. These characteristics result in opportunities for new applications. Superconducting-nanowire-based single-photon detectors have already been applied to problems ranging from LIDAR to integrated-circuit evaluation. With our newfound understanding of the microwave plasmonic properties of these materials, new applications may be envisioned which take advantage of the slow electromagnetic propagation speeds in the materials, the tunability of this effect, and the ability to integrate these materials with interesting technologies, e.g. with photonic and superconducting quantum systems.

Student event: Meet the speaker

We invite you to a **student-only** discussion-round with Prof. Dr. Karl K. Berggren before his Munich Physics Colloquium talk.

Be curious and feel free to ask any question.

Monday, 11 November 2019, 16:00 h,

Seminar room PH 3268 (upper floor), Physik-Department der TUM, James-Franck-Straße 1, Garching

