

TRR Guest Scientist Lecture / Seminar

Date/Time: 28.05.2018 / 11:00 Uhr
Location: Paderborn, P8.4.09

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Progress in single photon imaging from the UV to the mid infrared using superconducting nanowire detectors

Abstract:

Single-photon detectors are an integral part of experiments in quantum optics, and have applications in quantum computing, quantum communications, and the characterization of single photon sources. In particular, superconducting nanowire single-photon detectors (SNSPDs) are excellent broadband detectors due to their fast recovery times, low jitter, and low dark count rates. Until recently however, the efficiency of SNSPDs in the telecommunications band was relatively poor in comparison to other detector technologies. The recent development of amorphous superconducting alloys such as WSi and MoSi has led to significant improvement in system detection efficiency (~90%) compared to the early NbN-based SNSPDs. Furthermore, device yield has improved from ~30% to 100%, enabling for the first time the fabrication of SNSPD arrays and low-resolution single-photon cameras. I will discuss how these improvements in efficiency and device yield are enabling new applications such as imaging from the UV to the mid-infrared, with potential applications in astronomy and deep-space optical communications. Finally, I will outline new approaches to building arrays of SNSPDs for imaging at the single photon level.

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