



e-conversion



Seminarankündigung

**Dienstag, 23. November 2021
14:15 Uhr**

WSI, Seminarraum S 101

also ONLINE via ZOOM

<https://tum-conf.zoom.us/j/65312198094>

Meeting-ID: 653 1219 8094

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“Quantum dot based devices for telecom wavelength quantum networks”

Quantum networks are essential for realising a variety of tasks related to distributed quantum computing and sensing, and already have real-world applications in secure quantum communication. A variety of solid-state quantum optics platforms, most notably semiconductor quantum dots and defects in diamond, have been explored to demonstrate proof-of-principle experiments such as entangling distant spins or generating multiphoton entangled states. However, the best-known systems all tend to emit photons in the visible to near-infrared part of the spectrum, which is incompatible with efficient transmission of photons over long-distance optical fibres.

This seminar talk will be focussed on InAs/InP QDs, which can directly emit into the telecom C-band. Starting with an introduction to this material platform and the basic photonic properties of these QDs, we will then dive into recent experiments performed at Toshiba Cambridge Research Labs towards using them for quantum networking applications. These range from interference of quantum dot emission with a C-band laser qubit to high fidelity teleportation experiments, and the distribution of entangled photons over 15 km of real-world optical fibre in the Cambridge Fibre Network. Finally, we will conclude with some insights into the solid-state environment of the QDs that we gained along the way.

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