



e-conversion



# Seminar announcement

**Tuesday, July 12, 2022  
2 pm**

**ZNN, Seminar room EG 0.001**

**also ONLINE via ZOOM**

<https://tum-conf.zoom.us/j/66688239138?pwd=enYrQ1YrQ0VHUWxUSHgxVEtsNmRhZDZ09>

Meeting ID: 666 8823 9138

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## **“Quantum key distribution with entangled photons from quantum dots”**

The prospect of using the quantum nature of light for secure communication keeps spurring the search and investigation of suitable sources of entangled photons. Semiconductor quantum dots (QDs), also dubbed “artificial atoms”, are arguably one of the most attractive, as they can generate pairs of polarization-entangled photons with high efficiency and degree of entanglement. Despite recent advances, however, the exploitation of photons from QDs in advanced quantum communication protocols remains a major open challenge.

In this talk, I will first discuss how GaAs quantum dots can generate entangled photons with near-unity entanglement fidelity [1] and extremely low multipair emission probability [2]. Then, I will present our first steps towards the construction of a quantum-dot based quantum network for secure communication within the campus of Sapienza University of Rome [3, 4]. A discussion on future challenges and perspectives [5, 6] will conclude the talk.

[1] D. Huber, *et al.*, Phys. Rev. Lett. **121**, 033902 (2018)

[2] J. Neuwirth *et al.*, arXiv:2203.17077 (2022)

[3] F. Basso Basset *et al.*, Science adv. **7**, eabe6379 (2021)

[4] F. Basso Basset *et al.*, arXiv:2206.15360 (2022)

[5] F. Basso Basset *et al.*, Phys. Rev. Lett. **123**, 160501 (2019)

[6] C. Schimpf *et al.*, Appl. Phys. Lett. **118**, 100502 (2021)

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