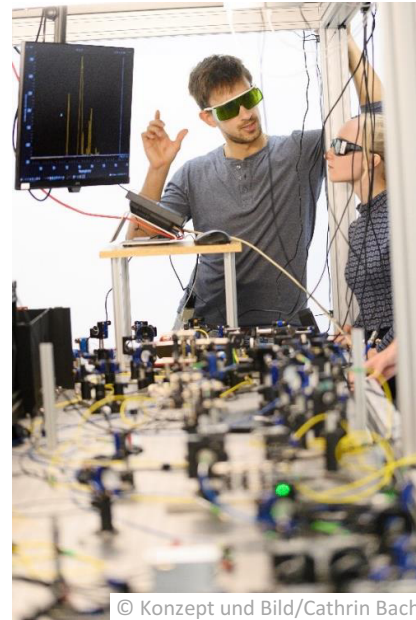


BQA Fellowship Project – Quantum Communication at Telecom Wavelengths

Project Title	Quantum Communication at Telecom Wavelengths
Group/University	Quantum Communication Systems at Technische Universität Berlin
Main Supervisor	Dr. Tobias Heindel (E-Mail: tobias.heindel@tu-berlin.de)
Co Supervisor	Prof. Janik Wolters (DLR Institute of Optical Sensor Systems)
Graduate School	Berlin School of Optical Sciences and Quantum Technologies (BOS.QT)
Funding Program	Berlin Quantum Alliance (BQA)

Photonic quantum technologies have the potential to profoundly change societies in a positive sense. While to date, quantum communication widely relies on attenuated lasers for secret key generation, existing limitations can be overcome in future quantum networks by using deterministic quantum light sources.

This BQA Fellowship aims at the development of novel quantum communication systems employing telecom-wavelength solid-state quantum light sources. A spotlight lies on nanophotonic devices based on epitaxial semiconductor quantum dots emitting in the C-band, as fabricated by our collaborators. In this context, the exploration of the quantum-optical properties of respective devices as well as the design and implementation of quantum cryptography testbeds are important project tasks. Moreover, we aim at a comparative benchmarking with other types of quantum light sources at this wavelength, e.g. based on spontaneous parametric down-conversion. A central aspect of the overall project is to explore the practical suitability of next-generation quantum light sources for their use in quantum communication networks, e.g. by testing the integration in deployed fiber networks in practical settings. The BQA Fellowship will be conducted in collaboration with the group *Physical Foundations of IT Security* of Prof. Janik Wolters at the DLR Institute of Optical Sensor Systems.



© Konzept und Bild/Cathrin Bach

The project builds on existing collaborations within the Berlin University Alliance and beyond and strengthens our activities towards the deployment of quantum local area networks in Berlin city. Both research groups involved offer a broad expertise and state-of-the-art infrastructure, resulting in a stimulating and synergic background in the lively environment of the German capital.