



# Multi-wavelength transceiver system

Free-space links for secure QKD networks

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*Cover: Optical transmitter with a high performance mirror telescope.*

*Top: View into the telescope system without obscuring secondary mirror.*

### Motivation

The multi-wavelength transceiver system was designed and implemented as a multipurpose platform for experiments in quantum communications. It contains an opto-mechanical transmitter (ALICE) and receiver (BOB) module, multiple quantum sources at 810 nm and 1550 nm, as well as multiple QKD analysis modules. Essential of both, the transmitter and receiver is a diffraction limited obscuration free telescope with four high-precision metal mirrors and active beam stabilization.

### Our expertise

- Link budget calculation and system design
- Optical design for transmitter and receiver systems
- AO-Design and AO control loop implementation
- Optomechanical design for (adaptive) optical systems
- Mirror telescope design and manufacturing
- QKD - sources and analysis

### What we offer

- Interdisciplinary team of physicists, optic designers, precision engineers and electronics engineers
- Development of adaptive-optical QKD system and sub-systems
- Free-space link characterization
- Free-space link infrastructure:
  - Intra-city link testbed
  - Transportable QKD platforms for ad-hoc free-space links
  - Optical Ground Station for satellite-based QKD (operational from 2024)



*Optical transmitter with a high performance mirror telescope and an entangled photon source for intra-city links (experimental setup).*

### Contact

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