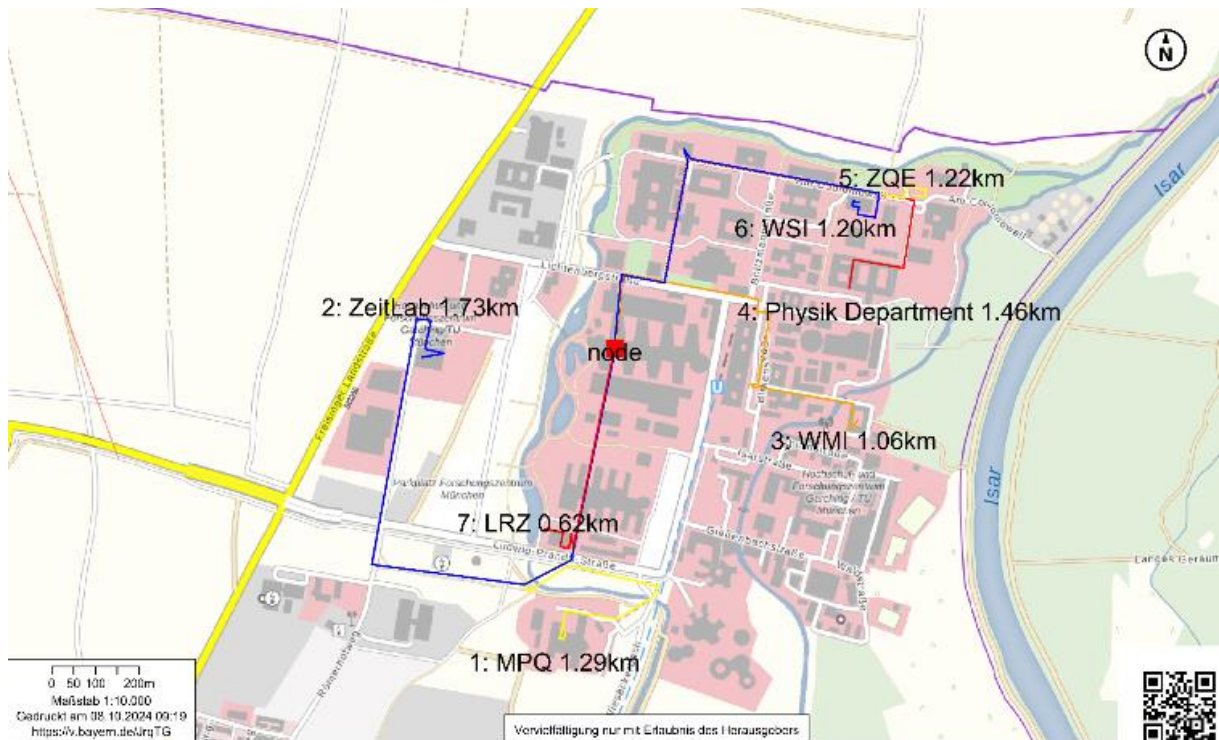


Quantum Network at the Technical University of Munich

QuANTUM is testing quantum communication of different quantum systems. With the polarization-compensated and time-synchronized fiber links from 780 - 1600 nm it will be possible to network quantum dots, trapped ions and neutral atoms, rare-earth ion doped crystals, etc. The idea is to really demonstrate quantum communication rather than a trusted-node QKD testbed (as has been demonstrated around the world before).



A: Brief Information

Testbed Title	Quantum Network at the Technical University of Munich
Institution/Organization	TUM, Research Group for Quantum Communication Systems Eng.
Contact	Prof. Dr. Tobias Vogl, tobias.vogl@tum.de
Status	planned

B: Technical Information

Start Point	End Point	Length [km]
48.26292042411735, 11.666763935336874 (Boltzmannstraße 3, 85748 Garching bei München)	Max Planck Institute of Quantum Optics (MPQ)	1.29
	ZeitLab	1.73
	Walther-Meißner-Institut (WMI)	1.06
	TUM-Physics	1.46
	TUM Center for Quantum Engineering (ZQE)	1.22
	TUM-Walter Schottky Institute (WSI)	1.2
	Leibniz Rechenzentrum (LRZ)	0.62
	TUM-MI	0.62
Type of Transmission	dark fiber	
Length [km]	10.8 total	
Losses [dB]	losses depend on wavelength	
Supported Wavelengths [nm]	780 nm – 1600 nm	
Type of Fiber	single mode	
Type of Deployment	underground	
Polarization Stabilization	Yes	
Quantum Communication Infrastructure	single photon sources VIS-NIR, QKD transmitter/receiver at 854 and 1550 nm; Si SPADs and SNSPDs; trapped ion and quantum dot and Erbium-doped crystal; color center experiments	
Available Infrastructure for external Parties		

C: Additional Information

Linked Projects	<ul style="list-style-type: none"> 6G und Quantentechnologie: https://www.ce.cit.tum.de/lkn/research-and-projects/6g-qt/ QCDE: https://www.dfg.de/en/news/news-topics/announcements-proposals/2021/info-wissenschaft-21-02
Press Release and Publications	<ul style="list-style-type: none"> Quantum Communication Networks: Design and Simulation, 2021 Foundations of In-Network Quantum Computing for Future Communication Networks, 2024

Demonstrated Milestone	<ul style="list-style-type: none">• planning phase
Outlook	<ul style="list-style-type: none">• deployment and commissioning;• demonstration of QKD and quantum communication between various quantum systems;• hybrid quantum nodes based on different platforms
Suggested Use Cases	
Other Comments/ Information	Updates will be posted here: https://www.ce.cit.tum.de/qcs/research/quantum/