

SEMINAR: Metropolitan-Scale Multiplexed Quantum Repeaters and Prospects for Global-Scale Quantum Networking

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September 18, 2026

12:00 to 13:00

Mir-Puig Seminar Room (MP210)

Quantum repeaters can overcome exponential photon loss in optical fibers, enabling heralded entanglement distribution for large-scale quantum networks. I will present our efforts to build quantum networks with an architecture of $i\frac{1}{2}$ backbone networks + mobile nodes $i\frac{1}{2}$, using rare-earth ions doped in solids. These efforts include: the first lab-scale demonstration of a multiplexed quantum repeater [Nature 594, 41 (2021), XingHan 1.0]; the metropolitan multiplexed quantum repeater [Nature Photonics 20, 812 (2026), XingHan 2.0]; quantum teleportation over a record distance of 14.5 km based on XingHan 2.1; quantum computing networks with heterogeneous entanglement [arXiv:2603.05836]; and a proposal for a new backbone channel based on balloons for global quantum networking [PRA 13, 022614 (2026)]. In addition, I will introduce our recent progress on ultra-long-life time transportable quantum memories based on Eu:YSO, with a lifetime approaching 1 hour [arXiv:2511.12537, Nature Photonics 20, 437 (2026)].

Hosted by: Prof. Dr. Hugues de Riedmatten