

SEMINAR: Reliable Quantum Links and Networks: Purification, Error Correction, and the 1Q Architecture

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15:00 to 16:00

Seminar Room

How should entanglement be distributed when links may be wireless, there are many users, and the available resources are imperfect? I will present recent activities of the CLASSIQUE center at Aalborg University at the intersection of quantum information and communication systems. Starting from the 1Q architecture - a first-generation wireless architecture integrating classical and quantum communication - I will explain how this setting raises new quantum-information questions. Two examples form the core of the talk. The first is resource-adaptive teleportation, where a family of codes punctured from a single mother code adapts to heterogeneous per-user link quality and to the channel asymmetry induced by entanglement purification. The second is the carrier-assisted entanglement purification protocol (CAEPP), which replaces the consumption of entangled check pairs by the transmission of carrier qubits and, with multiple carriers, achieves asymptotically perfect purification under any non-entanglement-breaking Pauli channel. I will close with ongoing and planned directions as possible topics for future discussion and collaboration.

Hosted by: Prof. Dr. Antonio Acin