

**Fakultät für Mathematik, Informatik und Physik
Universität Innsbruck**

**Ankündigung des öffentlichen Vortrags
(„defensio dissertationis“)**

im Rahmen der abschließenden kommissionellen Prüfung (Verteidigung der
Dissertation) im Doctor of Philosophy - Doktoratsstudium Physik

von

Dipl.-Ing. Dipl.-Ing. Pirker Alexander, Bakk. BSc

über

“Secure, entanglement-based quantum networks”

Zeit: Mittwoch, 9.Oktober 2019, 11.30 Uhr

Ort: SR “ IC Gebäude (EG)

Inhalt:

We present techniques to build secure quantum networks which utilize entanglement. For that purpose, we introduce different kinds of quantum network devices which share entangled states. The quantum network devices create the entangled states in the quantum network using entanglement distillation protocols, which they execute using measurement-based quantum computation with resource states. The use of entanglement distillation protocols results in entangled states which have a high fidelity, and importantly, we show that such quantum networks are secure by construction. Furthermore we present novel schemes to generate long-distance entanglement with a constant local overhead. Finally, we present a quantum network stack, which helps to standardize quantum networks and their network devices in a straightforward and well-defined manner

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