

**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

Wallnöfer Julius, BSc MSc

über

**“Multipartite and measurement-based approaches for
entanglement distribution”**

Zeit: Donnerstag, 12. Dezember 2019, 11.30 Uhr

Ort: Seminarraum 2, Technikerstraße 21a (Parterre, links)

Inhalt:

The recent advances in implementing quantum information theoretical concepts make even large quantum networks, which are accessible by many parties all around the world, conceivable. Certainly, such a large scale quantum network needs to be designed in a way that allows it to perform its tasks efficiently. An important step in finding a good design is to decide which strategies should be used to distribute the required entanglement between parties in the network. The key challenge in reaching long distances arises from imperfections and noise in the transmission of quantum states, e.g. photons in a fibre might be lost or unwanted interactions with the environment might change the quantum state. The quantum repeater is the central technology that allows one to achieve long distances despite those limitations. My thesis offers novel approaches and designs for distributing entanglement, or more specifically, multipartite entanglement for quantum networks. In my talk I will present variants of the quantum repeater that are inherently based on multipartite entangled states as elementary building blocks and discuss in which parameter regimes such a multipartite approach is beneficial.

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