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

Berit Neele Uta Vogell

über

“Quantum Optics Over Long-Distances: From Optomechanics to Quantum Networks”

Zeit: Freitag, 24. November 2017, 10.00 Uhr
Ort: Seminarraum 13, Architekturgebäude

Inhalt:
Performing a faithful transfer of an unknown quantum state is a key challenge for enabling quantum networks. The realization of networks with a small number of quantum links is now actively pursued, which calls for an assessment of different state transfer methods to guide future design decisions. In the talk, we will consider a basic quantum state transfer between two distant qubits, each in a cavity, connected by a waveguide, e.g., an optical fiber. In particular, we discuss and evaluate the achievable state transfer fidelities for two different protocols: standard wave packet shaping and adiabatic passage. In a realistic setting, photon losses during the transmission and absorption losses in the cavities are a central problem. Therefore, we include these losses and provide a full analysis of this model. We show that state transfer by adiabatic passage, in contrast to wave packet shaping, can mitigate effects due to undesired absorption losses in the cavities. In addition, we clarify that neither method can avoid photon losses within the waveguide.

Betreuer der Dissertation: o. Univ.-Prof. Dr. Peter Zoller

Prüfungssenat: **Univ.-Prof. Dr. Tracy Eleanor Northup**
Univ.-Prof. Dr. Gerhard Kirchmair
Univ.-Prof. Mag. Dr. Helmut Ritsch (Vorsitz)