universität innsbruck

Fakultät für Mathematik, Informatik und Physik

VORSTELLUNGSVORTRAG: Grundlagen der theoretischen Quanteninformation

Donnerstag, 24. Oktober 2019 Hörsaal B (Campus Technik)	
Barbara KRAUS	
15:00 Uhr	**Forschungsvortrag und Diskussion:** **"Quantum Information theory: from entanglement to quantum computing"** *Quantum information theory combines classicasl information theory with quantum physics. This combination opens the door to many fascinating applications which either do not have a classical counterpart or outperform them. Prominent examples thereof are quantum communication and quantum computation and simulations. Many of the application are possible due to the subtle properties of quantum many-body systems. In particular entanglement, which is a strong correlation among several quantum systems, plays an essential role.* *In this talk I will first summarize some recent results on multipartite entanglement. The consequences of these findings in the context of entanglement theory will be discussed. Then I will talk about certain aspects of quantum computations, where entanglement plays an important role. I will consider quantum algorithms which are composed of so-called matchgates.* *Whereas such an algorithm can always be compressed into an exponentially smaller quantum computation, the usage of an additional resource, the so-called magic states, elevates the computational power to universal quantum computation, while maintaining the same gate set. I will present the characterization of these magic states and discuss the consequences of these results in the context of quantum computation.*

*) Die Veröffentlichung von Namen und Titel erfolgt nur auf Zustimmung der Vortragenden.
Stellungnahmen zum Vortrag richten Sie bitte bis längstens 17:00 Uhr an Fakultaet-MIP@uibk.ac.at.