



Einladung

zum

Seminar des Instituts für Quantenphysik

Dr. Michael Hall
Griffith University, Brisbane

Concepts of quantum non-Markovianity: a hierarchy

Freitag, den 30.06.2017
10:00 Uhr
O25/H7

ABSTRACT:

Markovianity is easy to define for classical stochastic processes, and corresponds to the notion that the future evolution of a system does not depend on its detailed dynamical history, but only on its current state. In contrast, due to the noncommutativity of quantum observables - even for the same observable at different times - there are many possible quantum generalisations. A general consensus as to the 'correct' approach to quantum Markovianity is, therefore, still very much missing, and it remains a controversial issue: the term 'quantum non-Markovianity' has very different physical meanings for different individuals and communities, causing confusion in discussions and in the literature.

Rather than argue for a particular definition, I will consider clear and general definitions of a number of physical concepts that either have been, or could reasonably be, used to define quantum Markovianity. These include, for example, factorisability, white noise, dynamical semigroups, no information backflow, regression formulas, past-future independence, divisibility, and decreasing distinguishability. Different concepts are relevant in different contexts, and form a



logical hierarchy. If time permits, I will also discuss the concept of 'eternal non-Markovianity' for quantum systems.