

## CASUS Institute Seminar



### **Stochastic unravelings for the dynamics of quantum systems subjected to their environment**

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**Date:** Tuesday, 12 January 2021

**Time:** 14:00 – 15:00 CET

**Location:** CASUS Lecture Room, Görlitz

#### **Abstract:**

Quantum systems are inevitably interacting with the surrounding environments, which leads to a significant modification of their dynamical properties. There is a close connection between a master equation approach for the statistical operator and stochastic unravellings of the dynamics by means of pure states.

In numerical calculations, the latter is often favoured since the size of a pure state is the Hilbert space dimension (whereas the size of the statistical operator is the Hilbert space dimension squared). Ref. [PRL 68, 580 (1992)] proposes an unraveling of the dynamics via an ensemble of pure states that propagate probabilistically.

In this talk I present how this approach can be used to efficiently obtain the dynamics for systems subjected to thermal environments. I will then present results from our work, where we apply this scheme to the equilibration dynamics for a finite coupling between system and environment. Also, I discuss the dynamics of far from equilibrium systems, both for periodically driven systems and systems in contact with different baths.