



# Quantum Efficiency Seminar und Colloquium

**BRUNO LEGGIO**

Institute of Physics  
Albert-Ludwigs-Universität Freiburg

## Fluctuation theorems for non-equilibrium quantum processes

Thermodynamic systems in equilibrium can be described with the use of only a small number of state variables. The situation drastically changes in the case of systems driven far from their equilibrium states: their behavior during a single realization of the driving process is fundamentally unpredictable. However, there exists a class of laws, known as fluctuation theorems, allowing for a description of the probability distribution for the production of some quantities (such as work, or entropy) along non-equilibrium evolutions. In recent years, the extension of these laws (known to hold for any classical system) to the quantum realm has attracted a great deal of attention. We focus in particular on the consequences of dynamical memory effects on the fluctuating entropy production of an open quantum system, deriving a non-Markovian correction to the usual form of the quantum fluctuation theorem.

**Date:** Tuesday, November 20th, 2012 14:15  
**Location:** Lecture Hall 1, Hermann-Herder-Str. 3, Freiburg

Contact: Andreas Buchleitner, Institute of Physics, Quantum Optics and Statistics  
T +49 761 203 5821 F +49 761 203 5967 E [buchleitner\\_office@physik.uni-freiburg.de](mailto:buchleitner_office@physik.uni-freiburg.de)  
[www.physik.uni-freiburg.de](http://www.physik.uni-freiburg.de)