CARL VON OSSIETZKY universität OLDENBURG
FAKULTÄT V
MATHEMATIK UND NATURWISSENSCHAFTEN

Institut für Physik

Theoriekolloquium

Am **16. Juni 2016** um **14.15 Uhr** in **W2 1-143** hält

Herr Dr. Andre Barato (Dresden)

einen Vortrag mit dem Titel

Stochastic thermodynamics of Information Processing

Stochastic thermodynamics is a theory aimed at nonequilibrium systems with possibly large fluctuations, which are not contemplated in classical thermodynamics. Two main concepts of this field are the definition of heat and work at the level of single trajectories and the fluctuation theorem that generalises the second law of thermodynamics. It has been realized recently that stochastic thermodynamics is particular convenient theoretical framework to understand the relation between information and thermodynamics, which is an old problem dating back to Maxwell's demon.
I will discuss our results concerning this relation. First, I will show that the theory of stochastic thermodynamics can be generalized to include information reservoirs. Second, I will discuss bipartite systems that can be used to study cellular information processing. From a different perspective, I will introduce a thermodynamic uncertainty relation for biomolecular processes that connects the uncertainty in the output of a chemical reaction with the free energy that must be dissipated in order to sustain the chemical reaction. An uncertainty ε requires an energy dissipation of at least $2k_BT/\varepsilon^2$.

Interessierte sind herzlich eingeladen.

gez. Prof. Dr. Andreas Engel