EINLADUNG ZUM

WIENER PHYSIKALISCHEN KOLLOQUIUM

STOCHASTIC THERMODYNAMICS

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In this talk, I will give an introduction into the emerging field of stochastic thermodynamics and illustrate its main concepts with recent experimental data.
Stochastic thermodynamics provides a framework for describing small systems embedded in a heat bath and externally driven to non-equilibrium. Examples are colloidal particles in time-dependent optical traps, single biomolecules manipulated by optical tweezers or AFM tips, and motor proteins driven by ATP excess. The notions of classical thermodynamics like applied work, exchanged heat and total entropy production valid there on the ensemble level can now be consistently identified and measured on the level of an individual stochastic trajectory. Moreover, exact results that refine the second law like the Jarzynski relation and fluctuation theorems for entropy production can be proven. Key elements of this framework like a stochastic entropy can also be applied to quantum systems as experiments on an optically driven defect center in diamond will show. Finally, using these concept, the efficiency of nanoscopic machines like molecular motors can be determined and their performance be optimized.

Montag, 27. Juni 2011, 17:30 Uhr
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