



"Soft-Matter Seminar"

Douwe Jan Bonthuis

Rowland Institute at Harvard
Cambridge

„electrokinetic power generation and DNA confinement in nanofluidic channels“

Hydrostatic potential energy is converted to electrostatic potential energy by the pressure-driven transport of the net positive charge in the electrical double layer of a nanofluidic channel. Based on theoretical analysis, we calculate the maximum obtainable energy conversion efficiency.

We have measured the energy conversion efficiency in rectangular, slitlike nanochannels in fused silica, showing a lower efficiency than predicted. The discrepancy between measured and predicted efficiency is explained by introducing an electrical shunt conductance through the Stern layer.

The statistical mechanical properties of DNA molecules change drastically upon physical confinement, affecting several macroscopic parameters. We have studied the conformation of DNA molecules confined in slit-like nanochannels to a fraction of their bulk radius of gyration using laser-based fluorescence microscopy, showing the DNA conformation at unprecedented resolution.

Donnerstag, den 15.03.2007
11:00 Uhr
Raum PH 3344

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