



Physik-Kolloquium

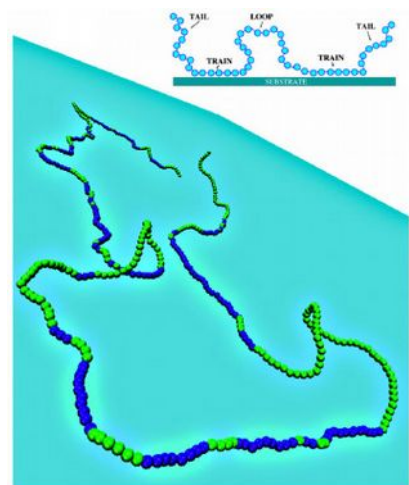
Donnerstag, den 28.11.2019, 17.00 Uhr

Prof. Dr. Kurt Binder

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Statistical Mechanics and Phase Transitions of Semiflexible Polymers

Semiflexible polymers are basic constituents of living matter (DNA, actin, etc.) and also important building blocks for liquid-crystalline devices. Their statistical mechanics still is incompletely understood. By large scale computer simulations theoretical concepts on semiflexible polymers are tested. When the chain stiffness varies, crossover scaling of the polymer radius occurs in bulk dilute solutions. For contour lengths L exceeding the persistence length ℓ , gaussian coils occur only in $d=3$ dimensions: in $d=2$ coil swelling due to excluded volume begins for $L > \ell$. The initial decay of orientational correlations in $d=2$ is twice as large as in $d=3$; but adsorbed chains do not behave strictly two-dimensional, perpendicular excursions occur on a lateral scale of the deflection length, and a gradual crossover of the decay length of orientational correlations is found. The adsorption threshold scales with the minus $1/3$ power of ℓ . In concentrated lyotropic solutions, nematic order occurs; the transition depends on both ratios L/ℓ and D/ℓ (D =chain thickness). The effect of collective deflection fluctuations on nematic order is elucidated, and the transition to smectic order is studied.



Joint Colloquium with *CompPhys19*, Leipzig, 28–30 Nov 2019

Ort: Hörsaal für Theoretische Physik, Linnéstraße 5

Alle Teilnehmer sind ab 16.30 Uhr zu Kaffee in der Aula eingeladen.