



Einladung zum Oberseminar Mathematik in den Naturwissenschaften

Julius-Maximilians-Universität Würzburg
Lehrstuhl für Mathematik in den Naturwissenschaften

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Surface energy and boundary layers for a chain of atoms at low temperature

We analyze the surface energy and boundary layers for a chain of atoms at low temperature for an interaction potential of Lennard-Jones type. The pressure (stress) is assumed small but positive and bounded away from zero, while the temperature goes to zero. Our main results are: (1) As $\beta \rightarrow \infty$ at fixed positive pressure $p > 0$, the Gibbs measures μ_β and ν_β for infinite chains and semi-infinite chains satisfy path large deviations principles. The rate functions are bulk and surface energy functionals $\bar{\mathcal{E}}_{\text{bulk}}$ and $\bar{\mathcal{E}}_{\text{surf}}$. The minimizer of the surface functional corresponds to zero temperature boundary layers. (2) The surface correction to the Gibbs free energy converges to the zero temperature surface energy, characterized with the help of the minimum of $\bar{\mathcal{E}}_{\text{surf}}$. (3) We provide bounds on the decay of correlations, some of them uniform in β .

Based on joint work in progress with Wolfgang König, Bernd Schmidt, Florian Theil.

Ort: Mathematik Ost, 40.03.003,

Zeit: Freitag, 15.02.19 um **10:30** Uhr

Zu diesem Vortrag sind Sie herzlich eingeladen.

gez. Anja Schlömerkemper