135th MSS-Seminar
Wednesday, December 11th,
15:30 hrs, Seminarraum (00.156),
Cauerstraße 3, Erlangen.

Nonlinear stochastic dynamics with memory in regular and random environments

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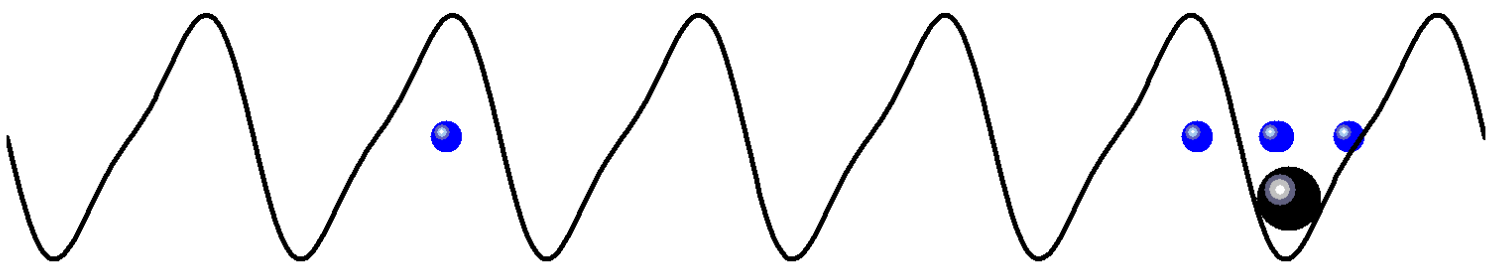

Stochastic dynamics with memory is ubiquitous. It naturally emerges, e.g., for transport and diffusion in viscoelastic environments like cytosol of living cells or complex polymer and colloidal solutions. It also arises naturally due to hydrodynamic memory effects leading to long tails of the velocity autocorrelation function of Brownian particles even in simple fluids. Often it is nonlinear, with periodic potentials and random potentials serving as paradigmatic models for regular and random environments, correspondingly. Nonlinear Generalized Langevin Equation (GLE) approach serves as a general theoretical tool, which is consistent with the foundations of statistical mechanics, to address the emerging complexity, including anomalous transport and diffusion. I will present a general approach based on multi-dimensional and multi-scale Markovian embedding of non-Markovian GLE dynamics involving a Prony series expansion of the memory kernel in GLE and introducing a subset of auxiliary particles modeling environment and elastically coupled to central Brownian particle. Recent advances and future perspectives will be discussed.