universität innsbruck

Department of
Theoretical Physics

Theory Colloquium

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"Coarse-Graining Non-Equilibrium Soft Matter Systems"

Abstract

Soft matter systems are often governed by processes on multiple different time and length scales. Bridging the gap between these scales and numerically study emergent behavior of many-body systems thus usually requires the usage of coarse-grained models. In general situations, such models will feature memory effects and correlated fluctuating forces. In equilibrium systems, a plethora of methodologies have been derived to construct dynamically consistent coarse-grained models and their applicability has been extensively studied. The generalization of these methods to non-equilibrium systems is, however, unclear.

In the first part of this talk I will give an introduction to coarse-grained modeling and highlight examples for successful applications. Subsequently, I will provide evidence why the presented methodology might not be directly applicable to non-equilibrium systems. In the second part, I will then present a roadmap on how to develop data-driven non-Markovian models for out-of-equilibrium soft matter systems and their applications in biological physics.

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SR 1 | ICT building