**133th MSS-Seminar**
Wednesday, December 4th,
15:30 hrs, Seminarraum (00.156),
Cauerstraße 3, Erlangen.

# Entanglements in heterogeneous polymers

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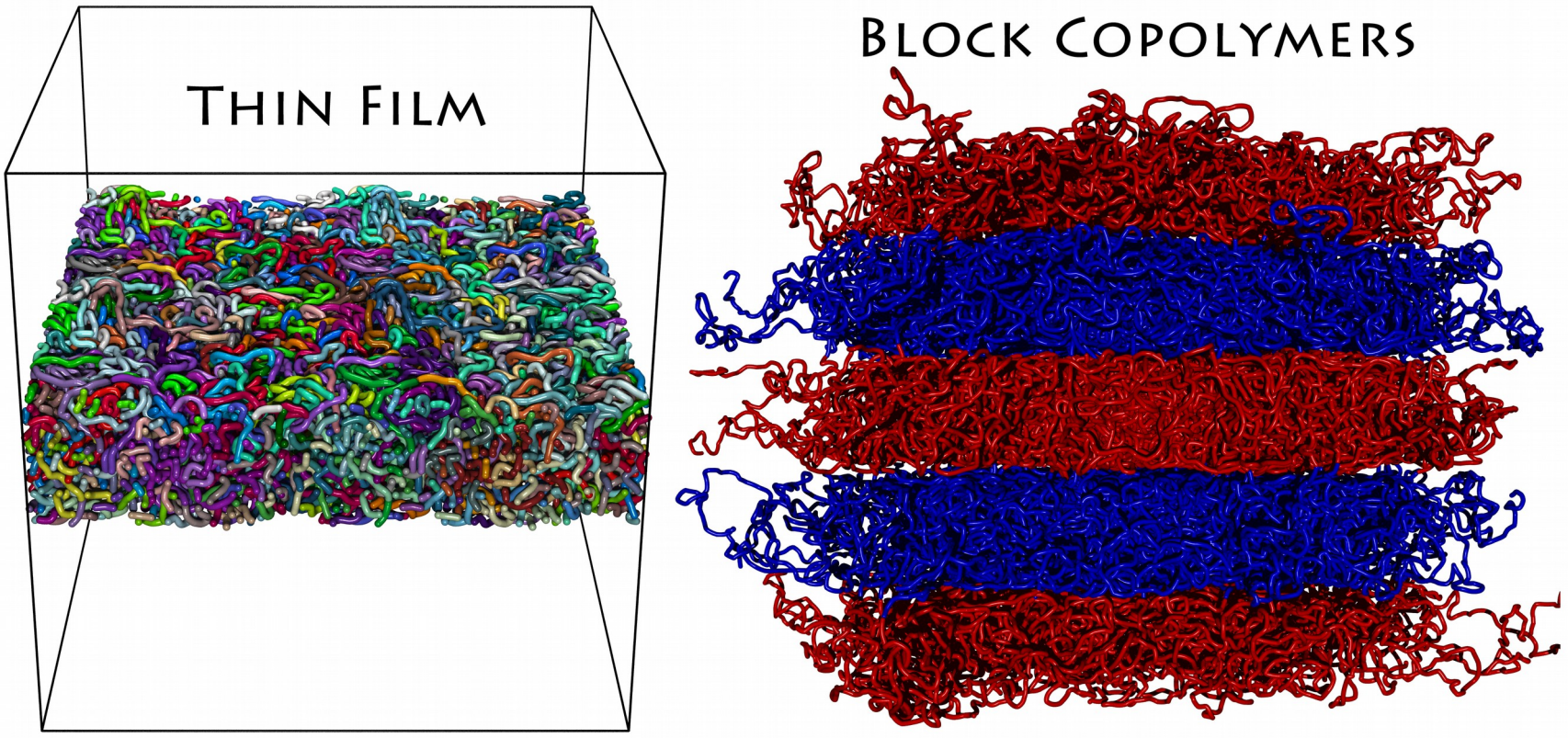


Unravelling the underlying physics in the viscoelastic behaviour of polymers is of fundamental interest but also is relevant to consider their technological applications. The dynamics of polymer melts and concentrated solutions depend strongly on the molecular weight of the polymer chains. Indeed, the natural inability of the chains to cross each other comes into play when the chain-length increases inducing mobility constraints; then the so-called entanglements appear. These restrictions dramatically change physical properties such as viscosity, dynamics, rheology and mechanical behaviour. At present, we know the entanglements are a universal aspect of the polymer physics which happen in any flexible polymer if the chain is sufficiently long and the concentration is high enough. Entanglements in homogenous systems in bulk conditions have been extensively studied through simulations and experiments, and some elegant theories provide the conceptual frameworks to interpret their behaviour. However little is known about those topological constraints on heterogeneous systems and multi-component polymers such as polymer melt under strong confinement (e.g., nanocylinders, thin films), diblock copolymers (BCPs) and nanocomposites.

From the theoretical point of view, building appropriates and practical approaches to simulate these systems is a long-standing challenge due to many technical issues. In this work, we show how a novel and promising coarse-graining can be successfully used to model and study the viscoelastic properties of heterogeneous polymer systems, most of them essential regarding basic research and technological applications.