Anomalous Diffusion and Stress Relaxation in Micellar Fluids[1]
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— This talk will address two long-standing questions on the dynamics and rheology of micellar fluids. First, it has long been hypothesized that branched micelles are much more efficient in relaxing internal stresses than linear ones via sliding of branches along main chain contours. Second, anomalous surfactant diffusion including superdiffusion has been suggested by experiments. Tracking the motion of branch points as well as individual surfactants poses a great challenge. We use molecular dynamics simulations of cationic surfactant solutions of cetyl-trimethyl-ammonium-chloride in the presence of a hydrotropic salt sodium salicylate to answer the above questions. The mechanisms of branch formation, superdiffusion and the energetics of branch motion will be discussed.

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