

## **Interfacial Dynamics in Polymer Nanocomposites**

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It is now well recognized that interfacial layer in polymer nanocomposite (PNC) controls their macroscopic properties. Polymer structure and dynamics are strongly affected by nanoparticles surface in the interfacial layer around them. The thickness of this interfacial layer is usually estimated to be several nm. In this talk we overview recent studies on structure and dynamics of the interfacial layer in various nanocomposite materials. Our dielectric relaxation studies and MD-simulations reveal a gradient in the interfacial layer dynamics, but no “glassy” layer. Small angle X-ray scattering data and dielectric spectroscopy provide consistent estimates of the interfacial layer thickness in various PNC. We discuss the role of polymer rigidity and molecular weight in the structure and dynamics of the interfacial layer. As a conclusion, we emphasize that fundamental understanding of PNC properties requires explicit account of the intrinsic heterogeneity in these materials.