

# Physics Colloquium

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*Towards Switchable Topography and Tunable  
Fluctuations in Biomimetic Lipid Bilayers*

**Friday, January 20, 2:30 p.m.**

**210 Robeson Hall**

Lipid bilayers are ubiquitous in nature; they form the backbone of cell membranes and are responsible for vital biological processes, including the regulation of protein functions and the exchange of nutrients in and out of the cell. In order to understand the function of lipid membranes and fully utilize their potential in biotechnologies, it is imperative to investigate the factors that control essential membrane processes, such as domain formation and protein recruitment. While decades of research have remarkably furthered our understanding of lipid membranes, the role of local curvature and nanoscale fluctuations remain to be the least understood. In this talk, I will present recent progress in developing a platform for topographic control of lipid bilayers, using thermoresponsive nanostructured polymer scaffolds, to explore curvature-mediated membrane phenomena, such as domain reorganization and switchable protein binding. I will also discuss ongoing experimental and computational studies on tuning nanoscale membrane fluctuations and investigating their effects on protein binding/insertion mechanisms.