

**Control of Anchoring of Nematic Fluids at Polymer Surfaces Created by
In-situ Photopolymerization**

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In this talk I will discuss a number of intriguing issues related to surface phenomena in liquid crystals and particular attention will be paid to anchoring and anchoring transitions at polymer interfaces. In-situ photopolymerization of alkyl acrylate monomers in the presence of a nematic fluid provides a cellular matrix of liquid crystalline droplets in which the structure of the encapsulating polymer exert control over the anchoring of the liquid crystalline molecules. Control is obtained by variation of the alkyl side chains and through copolymerization of dissimilar acrylates. For example, among a series of poly(methylheptyl acrylate)s, the 1-methylheptyl analog prefers planar anchoring of a nematic (TL205) over the temperature range studied. However, the polymers of other methylheptyl side chains display a homeotropic-to-planar anchoring thermal transition (T_i) similar to that of the *n*-heptyl analog. The alkyl side chains with double methyl branches, e.g., in poly (dimethylhexyl acrylate)s, are shown to afford the similar control of the anchoring. Copolymerization of two acrylates with opposing tendencies of aligning liquid crystal leads to tunability of anchoring behavior over a large temperature window. The observed broad anchoring transitions provide a way of achieving highly tilted anchoring.

I will also discuss some intriguing observation on defects and the dynamics of defects – in particular I will spend some time discussing Bloch Walls that are formed in the system.