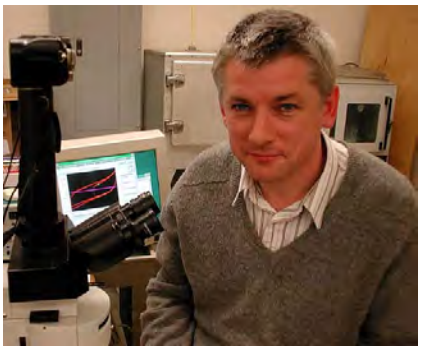

Using Liquid Crystals to Reveal Long-Range Order within Self-Assembled Monolayers formed on Solid Surfaces

Nicholas L. Abbott
Department of Chemical and Biological Engineering
University of Wisconsin
Madison WI 53706
Email: abbott@engr.wisc.edu

It has long been known that the surface-driven orientational behaviors of liquid crystals are sensitive to the structure of surfaces over a wide-range of length scales (Angstrom-scale to micrometer-scale). For example, details of the chemical functionality and nanometer-scale topography of surfaces can direct the orientations of domains of liquid crystal with characteristic sizes of tens of micrometers. This presentation will focus on the orientational behavior of liquid crystals on self-assembled monolayers formed from alkanethiols on gold films. Although these systems have been widely characterized in past studies, we have observed orientational behaviors of liquid crystals on these interfaces that suggest the presence of long-range order within these systems that has not been previously revealed. The results of a complementary study based on infrared-visible sum frequency spectroscopy confirm the presence of the long range order within these films. The origin of this long range order will be discussed. The results to be presented suggest methods based on self-assembly that lead to organized structures over large areas.