

Abstract Submitted  
for the MAR09 Meeting of  
The American Physical Society

**Polyelectrolyte and nanoparticle adsorption to nanopatterned surfaces** THUY CHASTEK, STEVEN HUDSON, VINCE HACKLEY, NIST, Gaithersburg, MD 20899 — The adsorption of polyelectrolytes and nanoparticles onto patterned and curved surfaces is investigated (by fluorescence and electron microscopy) and exploited to produce anisotropic patchy particles. Various anisotropic properties are necessary for the self-assembly of complex structures. In this work, particles were bound temporarily to a substrate, so that part of their surfaces is occluded during subsequent surface modification by the adsorption of polyelectrolyte. The substrate surface charge has a significant effect on the adsorption of particles, which provided several advantages in comparison to bare glass substrates. These include much reduced deposition time, a high degree of coverage, and the ability to accommodate both negatively and positively charged particles. Moreover, patch production yield is consistently  $99 \pm 1$  %. Rapid coating methods transferable to roll-to-roll processing were tested, and step-by-step characterization methods to evaluate yield were developed. High-yield site-specific binding of complementary spheres to the lithographic region of patchy particles and surfaces was demonstrated, including binding to positive and negative patches.

Steven Hudson  
NIST, Gaithersburg, MD 20899

Date submitted: 21 Nov 2008

Electronic form version 1.4