

Abstract Submitted
for the MAR07 Meeting of
The American Physical Society

Epitaxial Growth of Thin Colloidal Films in the Presence of a Depletant ITAI COHEN, MARK BUCKLEY, SHARON GERBODE, Cornell University, ERICA PRATT, Carnegie Mellon University, JALINA KEELING, Austin College — We describe the epitaxial growth of thin films comprised of hard-sphere colloidal particles sedimenting in the presence of a depletant polymer. The depletant polymer induces an effective attraction between microspheres, causing them to nucleate islands that grow and coalesce with one another. In addition, we use photolithography to control the morphology of the substrate. This allows us to investigate the effects of the underlying substrate structure on the epitaxial growth process. Using confocal microscopy, we image and track the colloidal particles as they diffuse, aggregate and rearrange their configurations during deposition. Island density and degree of layer-by-layer growth are determined as functions of the deposition rate and depletant concentration. The ease with which we are able to image deposition in real time and the similarity of our results to those obtained in atomic deposition experiments suggest that our system will allow us to model various processes that occur in atomic thin film epitaxial growth.

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Date submitted: 29 Nov 2006

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