Abstract Submitted
for the MAR09 Meeting of
The American Physical Society

**Nanopatterning as a Probe of Unstable Growth on GaAs(001)**[1]
KRISTA COSERT, CHUAN-FU LIN, AJMI HAMMOUDA, University of Maryland, HUNG-CHIH KAN, National Chung-Cheng University, Taiwan, ROC, KANAKARAJU SUBRUMANIAM, CHRIS RICHARDSON, Laboratory for Physical Sciences, RAY PHANEUF, University of Maryland — We report on observations of unstable growth on nanopatterned GaAs(001) surfaces. For growth at 500$^o$C, 1 ML/sec and an $As_2$/Ga beam equivalent pressure ratio of 10:1, we find that grooves oriented at right angles to [110] produce a build up of ridges of GaAs at the upper edges, while for grooves oriented at right angles to [1$\underline{1}$0] no ridges form; instead cusps evolve at the bottoms of such grooves [1]. The cusp-forming grooves show a pronounced initial amplification of depth during growth which changes with length/width ratio, and become more narrow. The ridge-forming grooves instead broaden during growth. We compare these experimental observations with kinetic Monte Carlo simulations in which a small anisotropic Ehrlich-Schwoebel barrier is included. [1] T. Tadayyon-Eslami, H.-C. Kan, L. C. Calhoun and R. J. Phaneuf, *Phys. Rev. Lett.* **97**, 126101 (2006)

[1]Work supported by NSF #DMR0705447, LPS and the UM-MRSEC # DMR0520471.

Ray Phaneuf
University of Maryland

Date submitted: 22 Nov 2008 Electronic form version 1.4