Abstract Submitted
for the MAR11 Meeting of
The American Physical Society

**Templating non-hexagonal monolayers of block copolymer spheres in confined geometries** ADETUNJI ONIKOYI, EDWARD KRAMER, GLENN FREDRICKSON, SU-MI HUR, UCSB — We investigate the ordering of poly(styrene-b-2vinylpyridine) [PS-PVP Mn = 56 kg/mol] sphere monolayers in wells of various shapes and sizes. Recent self-consistent field theory results on ordering of block copolymer (BCP) cylinders in square surroundings suggest that adding homopolymers of higher Mn can allow square arrays of BCP to form in small (4 to 5 cylinders across) square wells by relieving packing frustration. Experimentally, we adopt a similar strategy for ordering BCP spheres on silicon nitride membranes patterned by electron beam lithography to produce SiOx mesas, adding various volume fractions of PS homopolymer of different Mn. Scanning force microscopy, transmission electron microscopy and X-ray scattering has been used in a complementary manner to quantify the structures obtained after thermal annealing at 150 C. In the absence of PS additions, only defective hexagonal structures are observed even in wells containing 16 spheres. Adding 10% PS of Mn = 112 kg/mol to the BCP results in a square packing of spheres in square wells containing as many as 81 spheres.

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Date submitted: 23 Dec 2010 Electronic form version 1.4