Order and disorder in cylindrical block copolymers on a surface with positive and negative Gaussian curvature[1] A. HEXEMER, E. J. KRAMER, UCSB, V. VITELLI, C. D. SANTANGELO, R. D. KAMIEN, UPenn — We present a novel approach of creating surfaces with Gaussian curvature gradients by using commercially available colloidal particles and standard processing techniques. We also demonstrate that these non-flat surfaces can induce regions of both high order, as well as disorder in cylindrical block copolymer films depending on the Gaussian curvature of the surface. On a flat surface the ground state has no preferential direction and a high density of disclinations is observed. A Gaussian curvature destroys the isotropy in alignment and induces a preferential alignment. For small bumps the cylinders wrap around the top of the bump with a constant density of disclinations and dislocations as a function of distance from the top. Higher bumps show a disordered phase in a region on the top of the bump. The disorder is induced by the migration of disclinations towards the top of the bump. Present address of AH is LBNL.

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Date submitted: 20 Nov 2006   Electronic form version 1.4