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**Macroscopic Alignment of Cylindrical Block Polymer Thin Film via Raster Solvent Vapor Annealing with Soft Shear** MING LUO, DOUGLAS SCOTT, THOMAS EPPS, University of Delaware — One challenge associated with the utilization of block polymer thin films in nanotechnology is the difficulty of orienting and aligning the self-assembled nanostructure on macroscopic length scales, as block polymers typically self-assemble in an isotropic manner in the absence of surface forces and external fields. In this work, macroscopic alignment of block polymer cylinders was achieved through raster solvent vapor annealing with soft shear. Spatial control over nanoscale structures was accomplished through the application of a solvent vapor delivery nozzle, poly(dimethylsiloxane) shearing pad, and motorized stage. Complex patterns such as dashes, cross-shapes, and curved structures were demonstrated along with the possibility of scale-up for industry production. The simplicity of instrumentation and the versatility of patterns possess advantages over other directed self-assembly methods that are currently available.

Ming Luo  
University of Delaware

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