

Abstract Submitted  
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**Controlled Evaporative Self-Assembly of Hierarchical Polymer Stripes with Ordered Nanochannels** WEI HAN, MYUNGHWAN BYUN, LEI ZHAO, Iowa State University, JAVID RZAYEV, The State University of New York, ZHIQUN LIN, Iowa State University — A toluene solution of a bottlebrush block copolymer, polystyrene-poly lactide (PS-PLA), was confined in a “cylinder-on-flat” geometry, from which the consecutive “stick-slip” motion of the contact line of the PS-PLA solution was effectively regulated as the solvent evaporated, thereby forming gradient stripes at the microscopic scale. Upon subsequent solvent vapor annealing, hierarchically organized structures of PS-PLA were produced in which the lamellar nanodomains normal to the substrate were obtained within the stripes. After mild removal the PLA component, channels at the nanoscale were formed with the stripes. This facile approach of combining controlled evaporative self-assembly with subsequent vapor annealing opens up a new avenue to rationally organize and engineer self-assembling building blocks into functional materials and devices in a simple, cost-effective and controllable manner.

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