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Confinement-Induced Ordering in Dewetting of Polymer Blend Film¹ MU WANG, XIAO-CHUN CHEN, RU-WEN PENG, GUO-BIN MA, DA-JUN SHU, Department of Physics, Nanjing University — Dewetting and phase separation of polymer blend film on a periodically modified substrate can generate unique microstructures. Despite external perturbations in previous studies, polymer film remained continuous with the boundary locating at infinity. It is interesting to investigate dewetting and phase separation process in a confined geometry, such as a fishnet-like environment, where unique self- organization process is anticipated. We report here an effect that polymer blend film of polystyrene(PS) and poly (methyl-methacrylate)(PMMA) may evolve to a perfectly ordered droplet array on a periodically excavated silicon substrate, and each droplet possesses a PS kernel surrounded by PMMA cofferdam. The formation of regular pattern depends on initial thickness of polymer film and interstitial separation of microholes on substrate, and a scaling has been revealed. Our observation demonstrates a confinement-induced ordering in dewetting of polymer blend film, and suggests a budget and convenient approach to generate regular polymer microstructures over a large area.

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