

Abstract Submitted  
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**Capillary force induced assembly of high aspect-ratio polymeric micropillar arrays** DINESH CHANDRA<sup>1</sup>, SHU YANG, Department of Materials Science and Engineering, University of Pennsylvania — We present experimental evidence and theoretical calculations to show that when a liquid is evaporated off the surface of 2D arrays of micropillars, the micropillars cluster together due to lateral capillary meniscus interaction force rather than due to often reported Laplace pressure difference resulting from isolated capillary bridges. Experiments show that the pillars assemble while still completely surrounded by wetting liquid except at the tips and calculations reveal that the lateral capillary meniscus interaction forces are much smaller than those estimated from Laplace pressure approach. The cluster sizes of the collapsed micropillars as a function of their elastic modulus and the critical modulus for stability as estimated from capillary meniscus interaction approach agree well with the experimental observation. We also discuss the utility of such clustered micropillars as ultrathin whitening layers.

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