

Abstract Submitted  
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**Investigation of capillary flow in channels with polygonal cross sections: Simulations and experiments**<sup>1</sup> JIANGSHENG FENG<sup>2</sup>, JONATHAN ROTHSTEIN<sup>3</sup>, Univ. Massachusetts Amherst — A series of simulations and experiments will be presented which systematically investigate the flows in channels having polygonal cross sections through capillary action. Specific attention is focused on the evolution and shape of the resulting menisci. Simulations are performed using Surface Evolver in which several important parameters were varied including the number of sides, the characteristic length scale, the contact angle, and the curvature of the channel corners. The results are used to guide and compare with corresponding experiments of capillary force lithography (CFL). The elastomeric molds used in CFL are made by casting PDMS on a rigid patterned master previously fabricated by electron beam lithography combining with reactive ion etching to incorporate precise patterns of polygonal capillaries with the size of around 100nm. Products of CFL are characterized by atomic force microscopy as well as scanning electron microscopy. The results demonstrate that it is possible and practical to fabricate hierarchic structures of sub-100nm features on top of sub-micron patterns.

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