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Patterning Colloidal Films via Evaporative Lithography DANIEL HARRIS, University of Illinois at Urbana-Champaign, HUA HU, Corporate Engineering Technical Lab, The Procter and Gamble Company, JENNIFER LEWIS, University of Illinois at Urbana-Champaign — We investigate evaporative lithography as a route for patterning colloidal films during drying. Specifically, films composed of mixtures of silica microspheres and polystyrene nanoparticles are patterned by placing a mask above the film surface to induce periodic variations between regions of free and hindered evaporation. Fluorescence and confocal microscopy, coupled with surface profilometry measurements, reveal that particles segregate laterally within the drying film, as fluid and entrained particles migrate towards regions of higher evaporative flux. The colloidal films exhibit remarkable pattern formation that can be regulated by carefully tuning the initial suspension composition, separation distance between the mask and underlying film, and mask geometry.

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