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Ordering of Lyotropic Chromonic Liquid Crystal Films In Cylindrical Micropost Arrays[1] MARCELLO CAVALLARO, University of Pennsylvania, Department of Chemical and Biomolecular Engineering, MATTHEW LOHR, DANIEL BELLER, University of Pennsylvania, Department of Physics and Astronomy, LAURA LADERMAN, Swarthmore College, Department of Physics, KATHLEEN STEBE, University of Pennsylvania, Department of Chemical and Biomolecular Engineering, RANDALL KAMIEN, University of Pennsylvania, Department of Physics and Astronomy, PETER COLLINGS, Swarthmore College, Department of Physics, ARJUN YODH, University of Pennsylvania, Department of Physics and Astronomy — The use of micropost arrays is explored as a means for controlling self-assembly and director alignment in nematic chromonic liquid crystal (CLC) films. Experiment and numerical solutions reveal that the micropost arrays induce bistable director alignment in the film, along either diagonal of a square micropost lattice. We demonstrate stabilization of large domains of a single director orientation by rubbing the substrate surface along a single diagonal, a procedure which biases planar CLC director alignment in the film. Additionally, by varying the rubbing angle we investigate the competition between alignment via micropost patterns versus substrate rubbing, and we find the resulting assemblies to be largely controlled by micropost geometry. Variation of micropost layout, spacing and dimensions leads to further interesting self-assembled patterns and defect geometries.

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