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Novel Ordering of Soft Matter Using Chromonic Lyotropic Liquid Crystals[1] MATTHEW LOHR, DANIEL BELLER, MARCELLO CAVALLARO, University of Pennsylvania, SEVDE ARPACI, Bogazici University, JOHN NAPP, California Institute of Technology, KATHLEEN STEBE, RANDALL KAMIEN, University of Pennsylvania, PETER COLLINGS, Swarthmore College, ARJUN YODH, University of Pennsylvania — Chromonic lyotropic liquid crystals (CLLCs) are a unique and powerful system for governing self-organization in soft materials due to their temperature- and concentration-dependent ability to form nematics in (bio-compatible) aqueous suspensions. We present preliminary observations on several novel soft matter phases governed by the ordering of CLLCs. We first examine the phase behavior of low-concentration chromonic aggregates in surfactant-based lyotropic lamellar, hexagonal and nematic phases, and observe phase separation and mutual ordering. We also discuss the placement of colloidal particles at the interface of a thermotropic nematic liquid crystal and a chromonic nematic liquid crystal, and present initial results on defect coupling across the interface and colloidal self-organization from elastic interactions. We also present additional preliminary work examining the structure of CLLCs in confinement and their interactions with biologically inspired materials.

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