

Abstract Submitted  
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**End-functionalized triblock copolymers as a robust template for assembly of nanoparticles**<sup>1</sup> RASTKO SKNEPNEK, JOSHUA ANDERSON, MONICA LAMM, JOERG SCHMALIAN, ALEX TRAVESSET, Iowa State University and Ames Lab — Polymers with attached end groups with specific affinity for nanoparticles, i.e., functionalized polymers, are shown to provide a robust templating strategy, where the aggregated nanoparticles follow the mesoscopic order imposed by the polymeric matrix. In this talk, we will present a detailed investigation of triblock polymer templating as a function of both nanoparticle size and concentration. Next to phases such as hexagons or gyroids, regularly observed in copolymer solutions and melts, we find a novel square columnar phase of two interpenetrating line-lattices of micellar cylinders and aligned nanoparticles. We argue that this phase is a realization of the packing problem of binary mixtures of disks. Our study suggests that nanoparticle templating with functionalized block copolymers can provide a simple and efficient tool for assembling novel materials with nanometer scale resolution.

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