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Theory of Chirality Transfer in Block Copolymer Melts ISHAN PRASAD, GREGORY GRASON, Univ of Mass - Amherst — Block copolymers assemble into a rich spectrum of ordered phases, with complexity driven by asymmetry in copolymer architecture. Despite decades of study, influence of intrinsic chirality on equilibrium mesophase assembly of block copolymers is not well understood and largely unexplored. Self-consistent field theory has been largely instrumental in prediction of physical properties of polymeric systems. Recently, a polar orientational self-consistent field (oSCF) theory was adopted to model chiral block copolymers having a thermodynamic preference for cholesteric ordering in chiral segments, and which confirmed the equilibrium stability of a helical cylinder morphology observed for chiral diblocks. Here, I describe a newly developed oSCF theory for chiral nematic copolymers, where segment orientations are characterized by quadrupolar interactions, and focus our study on intra-domain nematic ordering in flexible block copolymer assemblies, and in particular, mechanisms of transfer of segment chirality to mesochiral symmetries of self-assembled bicontinuous network morphologies.

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