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Directed Assembly of Block Polymers EDWIN THOMAS, Department of Materials Science and NanoEngineering Rice University — Various types of boundary conditions and applied fields can be used to impose constraints on how the micro domain organize. In some cases the constraints serve to remove degenerate patterns which serves to eliminate defects that occur at the boundaries between energetically equivalent patterns. In other cases, either new micro domain patterns emerge or certain types of defects are created at special locations depending on the global and local symmetries of both the imposed constraints and the micro domains themselves. Addition of nano particles to a block polymer brings in additional considerations for the overall pattern of the system. Additive size, shape and surface chemistries relative to those of the block polymer influence their location in the overall pattern. By providing commensuration of block polymer period(s) as well as compatibility of the point group symmetries of both the particle(s) and domain(s), help realize systems where the equilibrium microstructure enables multifunctional physical properties.

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