

Abstract Submitted  
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**Diblock-copolymer brush tethered to a nanoparticle**<sup>1</sup> BART VORSELAARS, MARK M. MATSEN, University of Reading, JAEUP KIM, UNIST, TANYA L. CHANTAWANSRI, GLENN H. FREDRICKSON, UCSB — We model a brush of diblock copolymers grafted to a spherical nanoparticle, using self-consistent field theory (SCFT). This is achieved with a computationally fast algorithm that combines a pseudo-spectral method for solving the diffusion equation in spherical-polar coordinates and Anderson mixing to iterate the self-consistent field equations. The self-assembling block-copolymer films coat the nanoparticles with a variety of periodic surface patterns, which can be tuned by changing the various system parameters. Results are compared to previous SCFT calculations on flat surfaces, and it is seen that the curvature and finite surface area of the nanoparticle shifts the phase boundaries and introduces additional phase transitions. These patterned nanoparticle coatings are expected to have promising future technological applications.

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