

Abstract Submitted
for the MAR15 Meeting of
The American Physical Society

Field Theoretic Simulations of Polymer Nanocomposites in the Presence of Adsorbing Block Copolymers¹ JASON KOSKI, ROBERT RIG-
GLEMAN, University of Pennsylvania — The immersion of nanoparticles in a polymer matrix has given rise to improved mechanical, electrical, and optical properties of polymer-based materials. Understanding the phase behavior and controlling the spatial distribution of nanoparticles in these systems plays a critical role in controlling the resulting material properties. Polymer field theory continues to play an important role in our understand of polymeric materials, and recently we have extended the field theoretic framework to incorporate nanoparticles with arbitrary shape and surface grafting. In this talk, I will demonstrate some more recent extensions that incorporate local surface attractions either between nanoparticles or between the particles and a strongly adsorbing polymer, which could be important for systems where one block of the polymer has strong preferential interactions with the particle surface. Our approach enables the study of systems where many-body particle effects could become important and systems that can macro- or microphase separate while fully incorporating fluctuation effects.

¹NSF DMR- 1410246

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Date submitted: 13 Nov 2014

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