

Abstract Submitted
for the MAR15 Meeting of
The American Physical Society

Quantitative Analogy Between Polymer Grafted Nanoparticles and Patchy Particles¹ MAKOTO ASAI, Chemical Engineering, Columbia University, ANGELO CACCIUTO, Chemistry, Columbia University, SANAT KUMAR, Chemical Engineering, Columbia University — We establish a quantitative analogy between polymer grafted nanoparticles (PGNPs) and patchy nanoparticles (NPs). Over much of the experimentally relevant parameter space, we show that PGNPs behave quantitatively like Janus NPs, with the patch size having a universal dependence on the number of grafted chains and the ratio of the size the NPs to the grafted chain size. The widely observed anisotropic self-assembly of PGNPs into superstructures can thus be understood through simple geometric considerations of single patch model, in the same spirit as the geometry-based surfactant models of Israelachvili

¹The authors thank the National Science Foundation for financial support of this work. AC acknowledges financial supported from the National Science Foundation under CAREER Grant No. DMR-0846426.

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Date submitted: 15 Nov 2014

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