

Abstract Submitted  
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**Anomalous Phase Transitions in Soft Colloid-Polymer Binary Mixtures**<sup>1</sup> JAYDEEP BASU, AJOY KANDAR, Department of Physics, Indian Institute of Science, Bangalore, India, SURESH NARAYANAN, ALEC SANDY, XSD, APS, Argonne National Laboratory, USA — We have shown earlier [1] that these PGNPs resemble star polymers or spherical brushes in terms of their morphology in the melt. However, these particles show dynamics in melt which is quite different from other soft colloidal particles. Since most of the work on soft colloidal particles have been performed in solutions we have now explored the phase behavior of the PGNPs in good solvent using microscopic structural and dynamical measurements on binary mixtures of homopolymers and soft colloids consisting of polymer grafted nanoparticles. We observe anomalous structural and dynamical phase transitions of these binary mixtures, including appearance of spontaneous orientational alignment and logarithmic structural relaxations, as a function of added homopolymers of different molecular weights. Our experiments points to the possibility of exploiting the phase space in density and homopolymer size, of such hybrid systems, to create new materials with unique properties. Reference: 1. Sivasurender Chandran, Sarika C. K., A. K. Kandar, J. K. Basu, S. Narayanan, and A. Sandy, *J. Chem. Phys.* **135**, 134901 (2011).

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