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Tuning optical properties of polymer films using nanorods and Janus particles[1] RUSSELL COMPOSTO, SHU YANG, MICHAEL HORE, MARLA MCCONNELL, University of Pennsylvania — The optical properties of polymer films are tuned using novel nanoparticles. First, nanorods (NRs) of gold are organized and aligned within polymer films. Plasmon adsorption is investigated as a function of NP concentration as well as matrix type. NR organization and dispersion is compared with a model of a monolayer of nano-interacting rods. Second, multi-region and patchy, optically-active Janus particles were synthesized via a hierarchical self-assembly process. Gold nanoparticles were assembled on the top surfaces of nano- and sub-micron silica particles, which were selectively protected on their bottom surfaces by covalent attachment to a copolymer film. The morphologies of the gold particle layer, and the resulting optical properties of the Janus particles, were tuned by changing the surface energy between the silica and gold particles, followed by annealing.

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