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Forming hierarchically ordered hybrid materials using polymer crystallization CHRISTOPHER LI, BIN DONG, TIAN ZHOU, WENDA WANG, Department of Materials Science and Engineering, Drexel University, Philadelphia, PA 19104 — Hierarchically ordered hybrid materials are of great interest for next generation advanced materials research. In this presentation, we will present our recent results on employing polymer single crystals (PSC) to template nanoparticle assembly, leading to hierarchically ordered hybrid materials. Tailor-made, free-standing NP frames and wires containing single or multiple types of NPs have been obtained by using an in-situ polymer crystallization method. End functionalized poly(ethylene oxide) and polycaprolactone single crystals were used as the templates. Gold and magnetite NPs were successfully patterned as evidenced by transmission electron microscopy experiments. Interaction between NPs, free polymer chain as well as PSC has been systematically monitored using Surface Plasmon Resonance. It has been found that NP-free polymer chain interaction holds the key to forming ordered NP patterns in solution.

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