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LeRoy Apker Award Talk: Self-Assembly of DNA-Functionalized Nanoparticles

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Nanoparticles tethered with DNA strands can self-assemble into highly organized structures through the bonding of complementary nucleobases. These are promising building blocks for the bottom-up nanotechnology, and computational tools are useful to probe the behaviors of such complex materials. In this talk I will summarize my work on the phase behavior of nanoparticles tethered with a small number of DNA strands, and on the development of theories for the clustering and self-assembly kinetics of a specific case. Due to a separation of repulsion and attraction length scales, these nanoparticles exhibit an interesting hierarchy of phases made up of multiple interpenetrating structures.