

Directed Self-Assembly of Colloidal Particles

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Colloidal particles with sizes ranging from a few nanometers to micrometers can be assembled into usable macroscopic shapes for photonic or electronic devices with unusual structure-dependent properties. For higher yields and more complexity of such nano-scale structures, directed self-assembly process has been developed and we have adopted this technique to structuring colloidal particles at nanometer and micrometer scale. In particular, colloidal microspheres were efficiently assembled within very thin films over large area or integrated physical templates. Moreover, metallic nanoparticles were guided by complex nanostructures of block copolymers. In this presentation, we will review recent advances and the state of the art in these areas.