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Formation of Periodic Arrays of Nanostructures Using Self-assembled Colloidal Particle Lithography and Selective Deposition

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We demonstrate a new nanofabrication technique, colloidal particle lithography, in which we have combined two existing methods, nanosphere lithography (NSL) and self-assembled monolayers, to create nanopatterned surfaces. In colloidal particle lithography, a octadecytrichlorosilane (OTS) monolayers is deposited onto silicon oxide though a mask created by a close-packed monolayer of nanospheres, and, after removal of the spheres, a second materials (TiO_2) is deposited onto the nanostructures. Subsequently, the patterned SAMs on SiO_2 define and direct the selective deposition of titanium oxide films using atomic layer deposition. (ALD) The resulting nanostructure arrays are characterized using atomic force microscopy.