

Abstract Submitted
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Manipulation and Assembly of Semiconductor Nanowires with Holographic Optical Traps RITESH AGARWAL, Department of Chemistry, Harvard University, KOSTA LADAVAC, Department of Physics, New York University, GUIHUA YU, Department of Chemistry, Harvard University, CHARLES LIEBER, Department of Chemistry, Harvard University, DAVID GRIER, Department of Physics, New York University — Semiconductor nanowires are versatile building blocks for the assembly of functional electronic and photonic devices. Yet to realize their potential will require assembly into increasingly complex architectures with placement at specific locations in a parallel process. Here we describe progress towards the use of the holographic optical tweezer (HOT) technique for manipulating nanowires in solution. The HOT technique can create hundreds of individually controlled optical traps with the ability to manipulate objects in three dimensions. Our results show that individual nanowires can be aligned along a line of optical traps. Single traps cannot manipulate individual nanowires suggesting that the mechanism of trapping may be different than previously observed for dielectric microspheres. Our results also show that individual nanowires can be rotated in circles using an optical vortex, and that it is possible to fuse nanowire junctions and deposit nanowires irreversibly on substrates. Efforts towards creating nanowire arrays and other complex structures will be discussed.

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