Abstract Submitted
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**Ultra-dense nanowire arrays**[1] EZEKIEL JOHNSTON-HALPERIN, J.E. GREEN, D.W. WANG, E. DEIONNO, J.W. CHOI, Y. LUO, A. BOUKAI, Y. BUNIMOVICH, B.A. SHERIFF, J.R. HEATH, Division of Chemistry and Chemical Engineering, The California Institute of Technology, Pasadena, CA — The development of the superlattice nanowire pattern transfer (SNAP) technique has allowed for the fabrication of highly ordered arrays of hundreds of nanowires (both metallic and semiconducting) at pitches down to 16 nm and aspect ratios up to $10^6$. Applications of these nanowire arrays range from bridging length scales via binary-tree demultiplexing [1], to the development of ultra-dense arrays of molecular switch tunnel junctions ($\sim$ 1 TBit/in$^2$), to the integration of complementary logic arrays within a crossbar architecture. In addition, at the narrowest pitches the periodicity of the SNAP array is only a few tens of atoms, allowing access to length scales compatible with coherent electronic transport and opening the door to fundamental studies. These topics will be discussed within the context of the flexibility of the SNAP fabrication technique and its wide applicability to a number of both basic and applied challenges in nanoscience/nanotechnology. [1] Science, 310, 465 (2005).

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