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Self-assembly of Carbon Nanotube Based Devices on Programmable DNA Crystals HAREEM MAUNE[1], SI-PING HAN[2], ROBERT BARISH[3], MARC BOCKRATH, WILLIAM GODDARD, ERIK WINFREE, California Institute of Technology — The greatest challenges of nanoscience today include the ability to interface the new breed of versatile nanomaterial with the conventional electronics and the ability to arrange multiple nanocomponents into arbitrary pre-designed geometries with high density and nanoscale precision. These factors not only limit the feasibility of using the alternative nanostuctures for technological advances, but also hinder the elucidation of the structures' intrinsic properties. We will present a unique process for self-assembling DNA dispersed single-walled carbon nanotubes (SWNTs) into precise geometric arrangements with orientation control and demonstrate its implementation by self-assembling an all SWNT field effect transistor (FET). Not only does the precision, low cost, reproducibility and parallelism of our new process create novel opportunities for the implementation and investigation of complex nanosystems, but it also enables us to gain insight into the dynamics of molecular interactions between nanoscale objects of mega-daltons size.

[1]Equal contribution
[2]Equal contribution
[3]Equal contribution

Hareem Maune
California Institute of Technology

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