Nanomaterials and Nanocomputers: Promises and Challenges

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Future nanocomputers will require functional devices no bigger than a few nanometers. The state of the arts photolithography technology will likely to reach a bottle neck on further downsizing the device feature size below the present 65 nm scale. Nanoscale devices in nanocomputers will require a series of nanomaterials that are optimum for signal processing, data storage, and signal delivery etc.. There have been a series of nanomaterials demonstrating the properties in performing some of these functions for future nanomemories and nanoprocessors. In this talk, the experimental performance of a selected series of nanomaterials for application in nanoelectronic and memory devices will be reviewed. In particular, promises and challenges facing by carbon nanotubes, boron nitride nanotubes, ZnO and Si nanostructures will be discussed.