

## Next generation nanotechnology assembly fabrication methods: a trend forecast



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## NEXT GENERATION NANOTECHNOLOGY ASSEMBLY FABRICATION METHODS: A TREND FORECAST



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No binding. Book Condition: New. This item is printed on demand. Original publisher: Maxwell Air Force Base, Ala. : Center for Strategy and Technology, Air War College, Air University, 2008 OCLC Number: (OCoLC)255971062 Subject: Nanotechnology -- United States -- Forecasting. Excerpt: . . . transferred, and the patterns are etched to create devices. The limiting step is the pattern transfer. Non-optical methods of lithography are being pursued to overcome this size limitation. The lithographic process is arguably the key 23 enabling technology for the digital age. Lithography is used to pattern features of complex geometries as small as 50 nm with a remarkable level of perfection and placement ( registration ) with respect to the underlying substrate enabling hundreds of millions of devices to be fabricated on a single chip. But as the shrinking length scales continue, new imaging materials may be required to meet manufacturing constraints. These methods include block copolymer lithography, electron beam lithography, and nano-imprint 24 lithography. An entirely new, bottom-up architecture based on nano building blocks such as carbon nanotubes and semiconducting nanowires is being pursued by others. In this approach, nanoscale devices are constructed by direct, three-25 dimensional synthesis. Transistors are one such example. The following sections take a look at various methods being explored for self-assembly with brief explanations about the approach and possible applications. A summary table is included at the end of the chapter listing the primary source or user of each method, the convention employed for self-assembly, and current and or potential applications. Block Copolymer Directed Assembly Diblock copolymers are a promising class of materials that self-assemble to form ordered nanostructures. These structures include spheres, cylinders, and lamellae whose shape and dimensions depend on the molecular weight and composition of the polymer. Diblock copolymer lithography refers to the use of these...



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