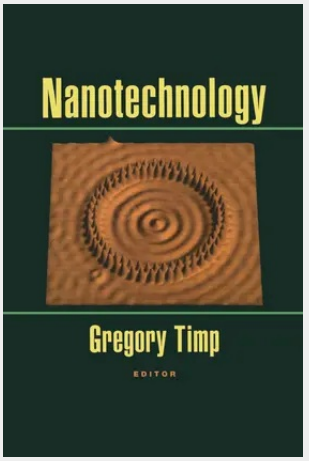
Timp

Nanotechnology



Miniaturization has revolutionized human affairs by making possible inexpensive integrated electronic circuits comprised of devices and wires with sub-micrometer dimensions. These integrated circuits are now ubiquitous, controlling everything from our automobiles to our toasters. Continued miniaturization, beyond sub-micrometer dimensions, seems likely. And so we are compelled to explore science and technology on a new, yet smaller scale: the nanometer scale. This volume is a survey of the machinery and science of the nanometer scale. Its twenty-two contributing authors, drawn from many different disciplines including atomic physics, microelectronics, polymer chemistry, and bio-physics, delineate the course of current research and articulate a vision for the development of the nanometer frontiers in electronics, mechanics, chemistry, magnetics, materials, and biology. They reveal a world thirty years hence where motors are smaller than the diameter of a human hair; where single-celled organisms are programmed to fabricate materials with nanometer precision; where single atoms are used for computation, and where quantum chaos is the norm. Aimed at the level of comprehension of at least a junior- or senior- level undergraduate science (biology, chemistry, physics, or engineering) student, the book provides a survey of developments within the breadth of the nanotechnology field. The book is thus intended for both students and researchers in tunneling microscopy, polymer chemistry, bio-physics, atomic physics, electrical engineering, mechanical engineering, materials science, condensed matter physics, biology, lithography, and chaos. Mathematical derivations have been minimized, but not eliminted. The book contains many illustrations, some in color.

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299,59 €
279,99 € (zzgl. MwSt.)

Lieferfrist: bis zu 10 Tage

Artikelnummer: 9780387983349
Medium: Buch
ISBN: 978-0-387-98334-9
Verlag: Springer
Erscheinungstermin: 21.12.1998
Sprache(n): Englisch
Auflage: 1999
Produktform: Gebunden
Gewicht: 1351 g
Seiten: 700
Format (B x H): 160 x 241 mm

Kundenservice Verlag Dr. Otto Schmidt KG
Neumannstraße 10, 40235 Düsseldorf | kundenservice@otto-schmidt.de | 0221-93738-997 (Inland)