



Nanotechnology: A Gentle Introduction to the Next Big Idea

By Mark A. Ratner, Daniel Ratner

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In *Nanotechnology: A Gentle Introduction to the Next Big Idea*, nanotech pioneer Mark Ratner and tech entrepreneur Daniel Ratner show how nanotech works, what's new, what's next, and why nanotech may be the next \$1 trillion industry. They survey every area of R&D: nanobots, quantum and DNA computing, nanosensors, biostructures, neuro-electronic interfaces, molecular motors, and much more. Simple, brief, and nearly math-free, this is the perfect briefing on nanotech technology and business for every non-technical reader.

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Editorial Review

From the Back Cover

Nanotech for everyone! The friendly, non-technical guide to the next industrial revolution.

- Discover the world's next \$1 trillion industry!
- The easy-to-understand guide to nanoscale technology, science, business, and ethics
- Today's hottest nanotech research and tomorrow's hottest applications
- Nanobots, quantum and DNA computing, nanosensors, neuro-electronic interfaces, and much more
- Insider's assessment of the nanotechnology marketplace and investment opportunities

By 2015, nanotechnology could be a \$1 trillion industry. Now, renowned nanotech pioneer Mark Ratner and technology entrepreneur Daniel Ratner show you how nanotech works, why it's so exciting, what's new, and what's next. They survey the entire field—technology and business—covering nanobots, molecular electronics, quantum computing, biostructures, nanotubes, molecular motors, nanosensors, and many other breakthrough applications. They provide easy-to-understand explanations of every key concept, plus dozens of visuals that bring nanotechnology to life. Coverage includes:

- A simple, brief, almost math-free introduction to nanotech science
- "Grand tour" of nanotech R&D, from "smart materials" to DNA computing
- Breakthrough biomedical applications, including neuro-electronic interfaces and new drug delivery systems
- Current and emerging nanotech systems for optoelectronics and communications
- Nanotech here and now: nano-enhanced tennis balls, suntan lotions, and other products already in the market
- A realistic assessment of nanotech investment opportunities for the short- and long-term
- Ethical issues associated with nanotech research and product development

About the Author

MARK RATNER, winner of the 2001 Feynman Prize in Nanotechnology, is Charles E. and Emma H. Morrison Professor in Chemistry at Northwestern University. He is widely credited as the "father of molecular-scale electronics"—thanks to his groundbreaking work with Ari Aviram that first envisioned how electronic circuit elements might be constructed from single molecules and how these circuits might behave. Ratner is a member of both the American Academy of Arts and Sciences and the National Academy of Sciences. He lectures worldwide on nanotechnology and its implications.

DANIEL RATNER, an engineer and tech entrepreneur, has founded two successful technology startup companies, serves as industry advisor to several other high-tech ventures, and was recently awarded the prestigious "30 Under 30" entrepreneurs' award by *Philly Tech* magazine.

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This book has a straightforward aim—to acquaint you with the wholeidea of nanoscience and

nanotechnology. This comprises the fabrication and understanding of matter at the ultimate scale at which nature designs: the molecular scale. Nanoscience occurs at the intersection of traditional science and engineering, quantum mechanics, and the most basic processes of life itself. Nanotechnology encompasses how we harness our knowledge of nanoscience to create materials, machines, and devices that will fundamentally change the way we live and work.

Nanoscience and nanotechnology are two of the hottest fields in science, business, and the news today. This book is intended to help you understand both of them. It should require the investment of about six hours—a slow Sunday afternoon or an airplane trip from Boston to Los Angeles. Along the way, we hope that you will enjoy this introductory tour of nanoscience and nanotechnology and what they might mean for our economy and for our lives.

The first two chapters are devoted to the big idea of nanoscience and nanotechnology, to definitions, and to promises. Chapters 3 and 4 discuss the science necessary to understand nanotechnology; you can skip these if you remember some of your high school science and mathematics. Chapter 5 is a quick grand tour of some of the thematic areas of nanotechnology, via visits to laboratories. Chapters 6 to 9 are the heart of the book. They deal with the topical areas in which nanoscience and nanotechnology are concentrated: smart materials, sensors, biological structures, electronics, and optics. Chapters 10 and 11 discuss business applications and the relationship of nanotechnology to individuals in the society. The book ends with lists of sources of additional information about nanotechnology, venture capitalists who have expressed interest in nanotechnology, and a glossary of key nanotechnology terms. If you want to discuss nanotechnology or find links to more resources, you can also visit the book's Web site at nanotechbook.com.

We enjoyed the writing and hope you enjoy the read.

Users Review

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Reginald McDade:

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