



# Nanotechnology: Molecular Speculations on Global Abundance

By BC Crandall

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Technology is becoming molecularly precise. Nanotechnology, otherwise known as molecular engineering, will soon create effective machines as small as DNA. This capacity to manipulate matter -- to program matter -- with atomic precision will utterly change the economic, ecological, and cultural fabric of our lives. This book, which is accessible to a broad audience while providing references to the technical literature, presents a wide range of potential applications of this new material technology.

The first chapter introduces the basic concepts of molecular engineering and demonstrates that several mutually reinforcing trends in current research are leading directly into a world of surprisingly powerful molecular machines. Nine original essays on specific applications follow the introductory chapter. The first section presents applications of nanotechnology that interact directly with the molecular systems of the human body. The second presents applications that function, for the most part, outside the body. The final section details the mechanisms of a universal human-machine interface and the operation of an extremely high resolution display system.

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## **Nanotechnology: Molecular Speculations on Global Abundance By BC Crandall Bibliography**

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## Editorial Review

### Review

With rich and colorful images, and with convincing logic, *Nanotechnology* presents a new technical field. I am certain this book will be well received by the imaginative and creative Chinese people.

(Deyong Kong, Professor of National Research, Center for Science and Technology for Development, China; Science and Technology Counsellor of the Permanent Mission of the People's Republic of China to the United Nations)

Molecular engineering will be the dominant art form of the 21st century; a vision and a language of how to construct digital flesh in a time when artificial life becomes real life. *Nanotechnology* is a key guide to understanding our techno-future.

(Arthur Kroker, co-author of *Hacking the Future*)

If *Nanotechnology* bears the fruits that many think it will, then it will radically transform nearly every facet of human life. *Nanotechnology* rigorously and yet imaginatively explores these dramatic changes. It is a book that sets fire to the mind.

(Peter Schwartz, Chairman, Global Business Network)

There are many things that science and technology have promised the human race, and many of these promises have been kept. *Nanotechnology* raises the ante, exceeding almost every earlier promise a billion fold. *Nanotechnology*, Molecular Speculations on Global Abundance gives a clear and nontechnical tour of things we might expect.

(Vernor Vinge, Associate Professor, Department of Math Sciences, San Diego State University)

I found this to be a very enjoyable and thought-provoking book looking into some of the more audacious directions that nanotechnology might go, with a good balance between straight design analysis, "what if" musings, and acknowledgement of associated policy problems. It also would be a good introduction for non-U.S. researchers as a cross-section of what is being talked about at present from certain futurists and should spark off quite a few ideas here in Japan.

(Dr. Tanya C. Sienko, Researcher, National Institute of Science and Technology Policy)

In *Nanotechnology*, BC Crandall provides a real service to the layman interested in this exploding technology of the 21st century. He discusses the playing field, the terms and the players. He and his collaborators then present exciting and amusing descriptions of the future nanoworld -- a world I would like to stick around to see.

(Admiral David E. Jeremiah, President, Technology Strategies & Alliances)

B.C. Crandall's *Nanotechnology* is both shocking and authoritative -- a feast for those who truly enjoy a glimpse of the future!

(**Greg Bear**, author of *Blood Music* and *Queen of Angels*)

In clear and compelling language, *Nanotechnology* describes the ideas and techniques that are creating a new domain of science and technology.

(**Edward O. Wilson**, Pellegrino University Professor, Museum of Comparative Zoology, Harvard University)

#### From the Back Cover

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#### About the Author

BC Crandall is cofounder and Vice President of Prime Arithmetics, Inc., and the Director of Molecular Realities.

## Users Review

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#### Tiffany Hassell:

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#### Jaime McKenney:

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**Veronica Turner:**

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**Wayne Joseph:**

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