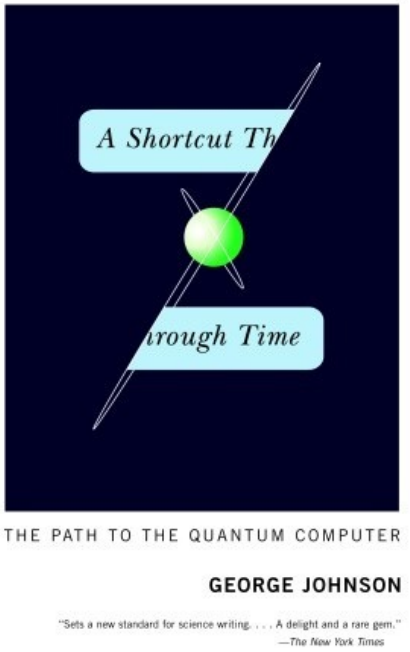


# A Shortcut Through Time: The Path to the Quantum Computer

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**A Shortcut Through Time: The Path to the Quantum Computer** George Johnson
In this remarkably illustrative and thoroughly accessible look at one of the most intriguing frontiers in science and computers, award-winning *New York Times* writer George Johnson reveals the fascinating world of quantum computing—the holy grail of super computers where the computing power of single atoms is harnassed to create machines capable of almost unimaginable calculations in the blink of an eye.

As computer chips continue to shrink in size, scientists anticipate the end of the road: A computer in which each switch is comprised of a single atom. Such a device would operate under a different set of physical laws: The laws of quantum mechanics. Johnson gently leads the curious outsider through the surprisingly simple ideas needed to understand this dream, discussing the current state of the revolution, and ultimately assessing the awesome power these machines could have to change our world.

## A Shortcut Through Time: The Path to the Quantum Computer Details

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| Date | : | Published February 10th 2004 by Vintage (first published 2003) |
| ISBN | : | 9780375726187 |
| Author | : | George Johnson |
| Format | : | Paperback 224 pages |
| Genre | : | Science, Nonfiction, Physics, Mathematics, Computer Science |

# From Reader Review A Shortcut Through Time: The Path to the Quantum Computer for online ebook

### Maurice says

I've attempted this book several times and I'm still not convinced that my mind is capable of comprehending the ideas within its pages. We may actually invent a quantum computer before I'm able to finish the book.

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### Matthew says

I raced through this book — although skimming on seemingly unimportant details at points, it is overall a very good read. Those wanting to learn about the technical aspects of quantum computing will be disappointed, but those wanting to scratch the surface will be impressed.

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### Brendan McAuliffe says

Oversimplified, but still useful. Didn't know about the quantum compter -> celluar automata connection. ( Also makes clear how important solving NP = P will { would } be )

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### Lena says

Great start for beginners just delving into the field of quantum computation.

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### David says

This is a book where phrases like “without worrying about the details” and “details aside” occur frequently, as the reader might be discouraged by the mind-bending complexity of quantum mechanics, such as the practical applications of the ability of individual atoms to spin in opposite directions simultaneously. I waded through these dense (but brief) descriptions and puzzling illustrations, and took away the following useful information:

1. The reduction in size and the increase in power of computers is likely to continue for the foreseeable future, and these changes may even become *more* dramatic than they have been until now (2011).
2. As a result of #1, ALL encryption as we now know it could be rendered obsolete by new technology.

If #2 comes to pass, rendering all previously-encrypted data readable, it is difficult to decide which is the more horrifying scenario:

1. This power of decryption is the monopoly of a few individuals, organizations, or governments;
2. This power of decryption is freely available to everyone.

I invite you to leave me a comment stating which you find less horrifying, and why.

Review from 6 April 2003 NY Times here.

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### Peter says

A great primer for what quantum computing might be able to do. Although with all of these things, as more research is completed, assumptions from even just a few years ago seem out of date. It would have been nice if there was more discussion about the practical impact of quantum computing beyond "the death of encryption".

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### John says

cool

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### Charles says

I bought this book second hand at the Stanton library book fair last year. Now I am reading it to try and understand what my fellow Toastmaster Dr Peter Rohde is researching!

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### David R. says

I still have no idea how this would work.

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### David Steele says

Scince journalists shouldnt write books trying to explain science

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### Bill says

Going into this book I wasn't entirely sure what to expect. I didn't know much of anything about Quantum computing or quantum physics for that matter and I was concerned that such a thin book might not do the subject justice. It turns out my concerns were misplaced.

This book takes a pretty difficult subject and somehow converts into language almost anyone can understand. It was really pretty amazing. I won't claim that I could totally grasp everything it laid out. In fact I just took a leap of faith a couple of times and assumed the author wasn't pulling my leg just so I could move forward. Some of this stuff just boggles my mind.

I don't know if I'll ever see a working Quantum Computer in my life time but if they actually figure out how to get the technology working it will be amazing and I'll be even more glad I read this book. It is a great introduction to the topic and the author, George Johnson (the NY Times science editor) does a commendable job of making a difficult subject digestable.

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### Gregg says

If the proposals of what leading edge thinkers say, the ramifications for quantum computing are profound. Imagine a state of existence in which multiple possibilities can be quantified as though they are factual. If I am to understand the concept of superposition, all possible state are in existence at once. If one were to factor lets say a number such as 1,000,000, all the factors would be arrived at simultaneously. If this ideal is pushed to a logical conclusion, what would one expect if a sufficient quantum computer (with enough Q-bit) was ask to find the highest number of pi ? If all possible states are arrived at, then all numbers of pi would also exist at once. How could this be if pi is infinite ? You would need an infinite amount of time to find an answer. With a quantum computer, time is slowed down, because multiple possibilities are explored simultaneously. A time machine you say, sort of, its just that time is being used more efficiently. If the Pi question was put to God, what would "its" answer be, could God find the highest number of Pi, or would God fail ? So must there be some answer ? The book then goes on to describe what Einstein called "spooky action at a distance". When two or more particles come into contact with each other, and they are moved, there remains a connection. When one particle is changed its sister particle is changed in proportion. Somehow information is exchanged instantaneously, or faster than light. Cultivating this phenomenon could revolutionize the communication industry. Then there is quantum memory. The text outlines how information is stored in the position, and oscillations of atoms. Theoretically more information can be stored, than there is information in the entire universe. This interpretation follows the edicts of psychometry, in which matter has the memory of everything that it has been a part of. I believe that through the phenomenon of quantum mechanics, as it relates to computing, it will be possible to use such a system as a host body for consciousness. When a soul/consciousness reincarnates, it uses the brain as a host to express itself in this reality. It is the flexibility of the organization of the brain /matter matrix, that makes this possible. Could a quantum computer manifest such an organization of matter flexibility ? This would be a real life ghost in the machine. The book does not touch on this, but the concepts in it lends credence to the ideal. The freedom for matter to exist in difference states/dimensions is the catalyst. I believe a quantum computer of a significant design, could achieve this within 10 years. What does this imply for Artificial intelligence ? The book does not go into too much detail about current A.I applications. One can conjecture, that when a solution is sought to a problem, a robust quantum computer, even running a current A.I program such as Watson or CYC, would do significantly better that conventional technology. Multiple, if not all solutions to a query are arrived at simultaneously. The material of in the book is a little involved, and a fair amount of the information requires rereading. Over all, when this book came out, it was an excellent choice at covering the mechanics of quantum computing, and the type of problems it could solve.

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### Upom says

I read Johnson's The Ten Most Beautiful Experiments, and was really enamored with Johnson's writing style. I decided to read another title about quantum computing. The book's opening was a strangely enlightening essay on the purpose of popular scientific writing. Though it was a bit off topic, I found it enjoyable. As for the actual book, it was a fairly well-written exposition of the theoretical underpinnings for quantum

computers: computers that would be able to use the quantum state to do absolutely outstanding calculations. Johnson's grasp on the topic s great, though his metaphors are a bit clunky, and aren't terribly easy to grasp. This might simply because of the odd nature of quantum mechanics, but it still was difficult. Nonetheless, he does a fairly good job of discussing the possible technology and its applications. Though we may be a while way from a quantum computer, an exciting world lays if they come to fruition.

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### Charlie says

a high-level overview of quantum computing - well done, but a little short on technical content

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### John Weiler says

Boring recount of the author’s introduction to sequential computing followed by his “scratching of the surface” of outdated numerical methods. Don’t waste your time here. Instead, look for a more current work.

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