

There is currently available a large selection of books giving a popular account of quantum theory and particle physics. In this book list I am describing books that I feel give the fairest treatment of our subject. In any subject as controversial as quantum theory personal prejudices are going to show. I have my favorites and my friends have other favorites. Many good books are not mentioned, and there are many not so good books that are also not mentioned.

I distinction between those books that talk just about the physics (or metaphysics) of quantum theory, and those that talk about the implications of these theories for the rest of our lives. I feel that this distinction will be useful to you as you choose what books you may want to read.

### **Books describing the physics**

***Schrodinger's Kittens and the Search for Reality***, John Gribbin, Little Brown & Co, 1996 ISBN: 0316328197, \$14.95

A basic survey of the history and interpretations of quantum mechanics.

**Other Worlds** by Paul Davies, Simon and Schuster 1980. \$11.95 in paperback.

An excellent book by quite a good physicist that concentrates on the metaphysical implications of quantum mechanics. A very balanced and accurate account of the controversies surrounding quantum mechanics without any of the emotionalism that you find in other books.

Actually, just about anything by Davies is very good (though I had a little trouble with Davies' attitude towards religion in *God and the New Physics*). Davies is my favorite science author of both popular and technical books.

**The Ghost in the Atom** edited by Paul Davies and J. R. Brown, Cambridge University Press 1986, \$9.95 in paperback

A wonderful little collection of interviews with physicists (John Wheeler, John Bell, David Bohm, etc.) who have been instrumental in the development of the controversies surrounding quantum mechanics. Very good for getting various points of view from the original proponents.

**Where Does the Weirdness Go?** by David Lindley, Basic Books 1996, \$13.00 in paperback

A discussion of how many of the strange aspects of quantum mechanics are hidden in everyday life. I've only thumbed through this book in the bookstore, but it looks pretty good.

**The Quantum Universe** by Tony Hey and Patrick Walters, Cambridge University Press 1987, \$16.95 in paperback

A beautiful, down to earth book describing the discoveries and applications of quantum mechanics. Full of pictures (many in color), this book should be read by anyone who needs grounding on just where quantum mechanics fits into our lives.

**Causality and Chance in Modern Physics** by David Bohm, University of Penn. Press, 1957. In paperback.

A thorough and deep discussion of the role of probability in quantum mechanics and the development of hidden variable theories. Bohm invented the first workable hidden variable theory about the time he wrote this book. Actually a little out of date, predating the work by Bell and others discussing hidden variables, this book will give a good understanding of the problems of interpreting quantum mechanics.

Any book by Bohm is worth reading, though he has lately written more about philosophy and metaphysics than physics. Just know what you are picking up.

**Taking the Quantum Leap** by Fred Alan Wolf, Harper and Row, 1981. \$10.95 in paperback.

A playful, more up to date version of the above book. Without pulling any punches, Wolf surveys the various interpretations of quantum theory. The discussions of the problems and proposed solutions are clear and lucid. I have trouble with Wolf, however, as he has the habit introducing very problematical ideas to the reader as if they were accepted truth. Still worth reading, just keep in a skeptical frame of mind (i.e. read something else in addition).

**Quantum Mechanics and Experience** by David Z. Albert, Harvard University Press, 1992. \$14.95 in paperback.

This book introduces the mathematical formalism of quantum mechanics "in a way that presumes nothing at all ... about the mathematical preparation of the reader" and then tries to convince you to believe the Bohm version of the pilot wave theory. While all the mathematics is introduced from the ground up in a relatively non-mathematical way, it does require an ability to keep track of mathematical thinking. If you are not a mathphobe, and know what a matrix is, you may want to try it.

**Neils Bohr's Times** by Abraham Pais, Oxford University Press, 1991. \$17.95 in paperback.

A moderately technical scientific biography of Neils Bohr, one of the founders of quantum mechanics and the father of the Copenhagen interpretation. This book surveys the various crises and debates which resulted in quantum mechanics as we know it today from an historical perspective.

-----  
The class web site is

<http://homepage.mac.com/stevepur/physics/qw>

where you will find several good links to resources on quantum mechanics