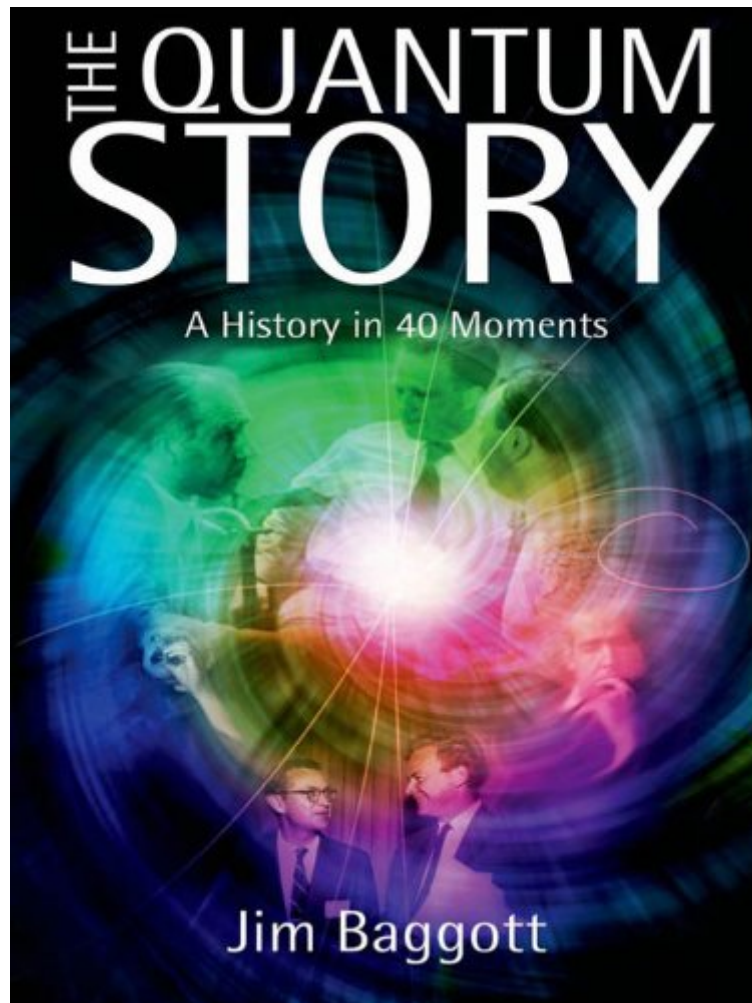


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# The Quantum Story: A History In 40 Moments (Oxford Landmark Science)



## Synopsis

The twentieth century was defined by physics. From the minds of the world's leading physicists there flowed a river of ideas that would transport mankind to the pinnacle of wonderment and to the very depths of human despair. This was a century that began with the certainties of absolute knowledge and ended with the knowledge of absolute uncertainty. It was a century in which physicists developed weapons with the capacity to destroy our reality, whilst at the same time denying us the possibility that we can ever properly comprehend it. Almost everything we think we know about the nature of our world comes from one theory of physics. This theory was discovered and refined in the first thirty years of the twentieth century and went on to become quite simply the most successful theory of physics ever devised. Its concepts underpin much of the twenty-first century technology that we have learned to take for granted. But its success has come at a price, for it has at the same time completely undermined our ability to make sense of the world at the level of its most fundamental constituents. Rejecting the fundamental elements of uncertainty and chance implied by quantum theory, Albert Einstein once famously declared that 'God does not play dice'. Niels Bohr claimed that anybody who is not shocked by the theory has not understood it. The charismatic American physicist Richard Feynman went further: he claimed that nobody understands it. This is quantum theory, and this book tells its story. Jim Baggott presents a celebration of this wonderful yet wholly disconcerting theory, with a history told in forty episodes – significant moments of truth or turning points in the theory's development. From its birth in the porcelain furnaces used to study black body radiation in 1900, to the promise of stimulating new quantum phenomena to be revealed by CERN's Large Hadron Collider over a hundred years later, this is the extraordinary story of the quantum world. Oxford Landmark Science books are 'must-read' classics of modern science writing which have crystallized big ideas, and shaped the way we think.

## Book Information

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## Customer Reviews

A delicious book for anybody who loves science and especially physics. The story of the most absurd, funny, incomprehensible theory we have, and still the most effective and powerful of all physical theories: quantum mechanics. A theory that truly shows how reality is different from the common idea we have about it. The story is told in a lively and capturing way, via 40 short key "moments", when the theory has been glimpsed, conceived, understood, tested, questioned and applied, by an extraordinary sequence of characters from Planck and Einstein, via Feynman, until our days. Each such "moment" is a lively, very readable, very simple, very human portrait of a crucial step ahead in the modern understanding of the strange and deep structure of reality. The beauty of the book is that it concedes little or nothing to wild unproven speculations or dreams about "what the world might be". It is established physics, and still it is more strange and magic than many current fashionable speculations. At the end, one feels as having understood contemporary physics better than from a textbook or a standard popular science account. A book to be read in a night, or sip bit by bit, one short chapter after the other. A pleasure for intelligence and an extraordinary description of how science actually works.

This appears by all accounts a thoroughly well researched work. But, it is tough going. If you don't have a grasp of mathematics, this can, in some places, bog you down. But if you have more than just a passing interest in quantum physics, then this should not be a discouragement, as there is much in this book that can be entertaining and enlightening. Particularly if you are interested in the historical development of this area of science. The Kindle version is well laid out with 'clickable' footnotes. As someone who is not mathematically inclined but interested in the physical (and not so physical) make-up of our world, this has been a good find.

Jim Baggott is taking on a path well travelled in this recounting of the quantum story. His mode of travel works well, concentrate on the human element, stretch the reader with the technical details and don't oversimplify. You don't get a Guernsey telling this kind of history without really knowing your stuff, and Baggott shows that he does. For the early chapters, the explanations of quantum theory are as good as any I have read - De Broglie's dual wave-particle hypothesis, Heisenberg's matrix mechanics and Born's rationalisation of the wave function are stand-outs. The shadow of Einstein falls over all players and debate, and Baggott's explanations of the gedankenexperiments of Einstein and others enrich the story. Baggott's rendition of the middle era of quantum theory after WWII gets a little turgid, with many layers of detail hanging a little limply without more mathematical backbone. The evolution and testing of the Standard Model was laborious in real life, so I guess the story needs to impart some of that. Again, Baggott really knows his stuff so, while this era is slow to wade through, I expect the index will provide the reader with a good reference to be reminded of an overview or context on specific points long after the back cover is closed. The modern era is well described and wide-ranging to help the reader see how topics such as string theory and supersymmetry have influenced modern quantum physics. Baggott's writing is crisp and his insights and anecdotes are told, or retold, in a fresh style. It's a long story and worth the investment.

Here are excerpts from Jeremy Bernstein's book review in the Wall Street Journal: 'I have never come across a book quite like Jim Baggott's "The Quantum Story." He has done something that I would have thought impossible in a popular book. He manages to present the full ambit of the theory, starting with the introduction of the quantum--the basic unit of energy--by the German physicist Max Planck in the beginning of the 20th century, and ending with the search for the Higgs particle at the collider at CERN in Geneva. In doing this Mr. Baggott navigates successfully between the Scylla of mathematical rigor and the Charybdis of popular nonsense.'... 'I very much liked "The Quantum Story," but I have a word of caution. It is not easy to read. The problem is not the mathematics. There is almost none. The problem is that physics is hard. Quantum mechanics is hard. Like a good wine, you cannot take this book in gulps. Take it in sips. It is well worth it.'

An excellent history of quantum physics presented in 40 concise, interesting chapters--from Max Planck developing the physical constant that carries his name in 1900 to today's superstring theory and high-energy particle colliders. While the science and math are presented in a manner that is understandable for most with college-level math and physics, once the book progressed beyond the Standard Model of particle physics (chapter 29), I was only grasping the concepts. However, the

history was what really interests me, and the book delivered all I expected and more. The combined cooperation and competition between some of the greatest minds of the 20th Century is fascinating, as is the interplay and interdependence between the theoretical and experimental physicists. As someone who works in software technology and has some capacity for abstract thought, I am in awe of the minds that conceived the subatomic structure of our universe.

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