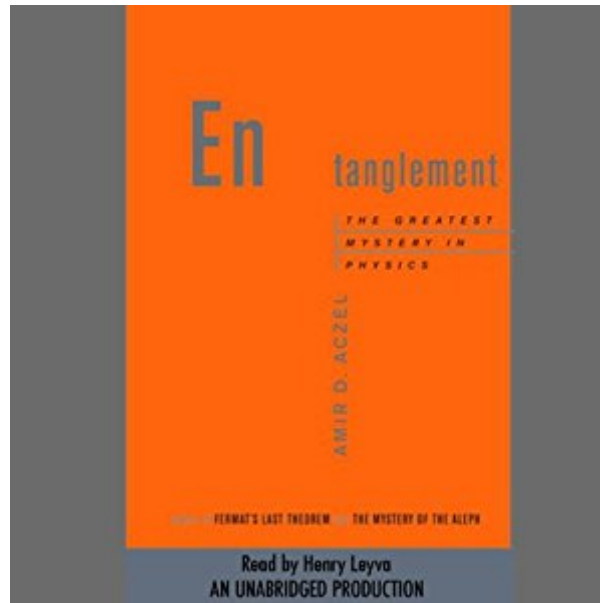


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# Entanglement: The Greatest Mystery In Physics



## Synopsis

Will "beam me up, Scotty" become reality? Quantum mechanics suggests it may...and soon. Since cyberspace - a word coined by a science fiction writer - became reality, the lines between "science" and "science fiction" have become increasingly blurred. Now, the young field of quantum mechanics holds out the promise that some of humanity's wildest dreams may be realized. Serious scientists, working off of theories first developed by Einstein and his colleagues 70 years ago, have been investigating the phenomenon known as "entanglement," one of the strangest aspects of the strange universe of quantum mechanics. According to Einstein, quantum mechanics required entanglement - the idea that subatomic particles could become inextricably linked, and that a change to one such particle would instantly be reflected in its counterpart, even if a universe separated them. Einstein felt that if the quantum theory could produce such incredibly bizarre effects, then it had to be invalid. But new experiments both in the United States and Europe show not only that it does happen, but that it may lead to unbreakable codes, and even teleportation...Entanglement is also available in print from Four Walls Eight Windows.

## Book Information

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## Customer Reviews

In 1935 Einstein, Rosen and Podolsky raised a serious criticism of quantum theory in the form of a paradox. The criticism meant that quantum theory brings about a "spooky action at distance" or "entanglement" between quantum subsystems. Two photons generated at a point with a correlation, for example, continue to have the correlation even after they are separated by a great distance, and a change in the state of one of them affects the other instantaneously. In 1964 John Bell proposed a

mathematical theorem experimentally to test the existence of entanglement. Alain Aspect carried out such an experiment in 1982 to show that entanglement is a reality. Even one of the greatest physicists in history, Albert Einstein, could not suppose that entanglement would be a reality. So it must be quite difficult to make ordinary person understand it. Amir Aczel tried to do this difficult task in this book, but he does not seem to have well succeeded. Just half of a total of 20 chapters is spent to describe the history of quantum mechanics, though a short mention about entanglement appears at a few places. Thus the reader who learned quantum mechanics to some extent at least would find the first half of the book rather tedious. From the story of debate between Einstein and Bohr in chapter 11, the book becomes interesting. However, the author explains neither Bell's theorem nor the details of many experiments understandably. On the final page, the author reveals the reason of difficulty in understanding entanglement writing, "... the quantum theory does not tell us why things happen the way they do; why are the particles entangled?" Was our expectation to the author too big?

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