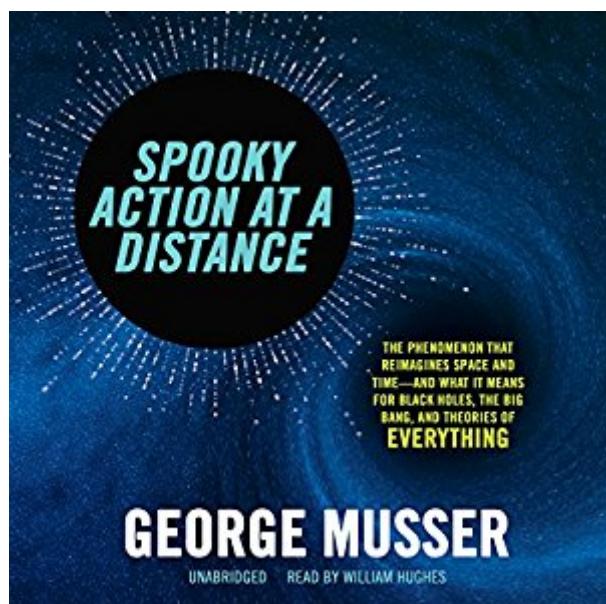


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# **Spooky Action At A Distance: The Phenomenon That Reimagines Space And Time—and What It Means For Black Holes, The Big Bang, And Theories Of Everything**



## Synopsis

What is space? It isn't a question that most of us normally stop to ask. Space is the venue of physics; it's where things exist, where they move and take shape. Yet over the past few decades, physicists have discovered a phenomenon that operates outside the confines of space and time. The phenomenon - the ability of one particle to affect another instantly across the vastness of space - appears to be almost magical. Einstein grappled with this oddity and couldn't quite resolve it, describing it as "spooky action at a distance". But this strange occurrence has direct connections to black holes, particle collisions, and even the workings of gravity. If space isn't what we thought it was, then what is it? In *Spooky Action at a Distance*, George Musser sets out to answer that question, offering a provocative exploration of nonlocality and a celebration of the scientists who are trying to understand it. Musser guides us on an epic journey of scientific discovery into the lives of experimental physicists observing particles acting in tandem, astronomers discovering galaxies that look statistically identical, and cosmologists hoping to unravel the paradoxes surrounding the big bang. Their conclusions challenge our understanding not only of space and time but of the origins of the universe - and their insights are spurring profound technological innovation and suggesting a new grand unified theory of physics.

## Book Information

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## Customer Reviews

Musser is very determined to convince the reader that there is something mysterious going on in the universe. He spends a lot of time explaining various scientists theories as to what is behind the

mystery. Yet he spends little time actually explaining the experiments that prove there is actually something mysterious going on. His explanation of "entanglement" seems to say that if you create two objects which are identical and you examine both of them after one of them has been moved across the room, that it is a surprise that they are in fact still identical. A better explanation of the mysterious experiments which cause scientists to be so surprised, would add much needed clarity to the subject. He also speaks about Schrodinger's cat without spending any time explaining that thought experiment. It would have been helpful to have that item covered in some detail. I got the distinct feeling that Musser didn't really understand the science very well so he decided to write as an historian of science instead so he could avoid the science and stick to quoting scientists and cataloging their debates. As a result, he does cover just about every theory that anyone has hypothesized that relates to the subject with the exception of the "Turtles All The Way Down" theory. The problem with these theories is that they seek to incorporate all the things that are known about the universe but none of them seems to be sufficiently robust to make scientifically testable predictions not to mention, how such tests might actually be carried out. One gets the distinct feeling that our human ability to think at the required level of abstraction coupled with our inability to test at the energies and scales required makes further significant progress in physics rather unlikely.

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