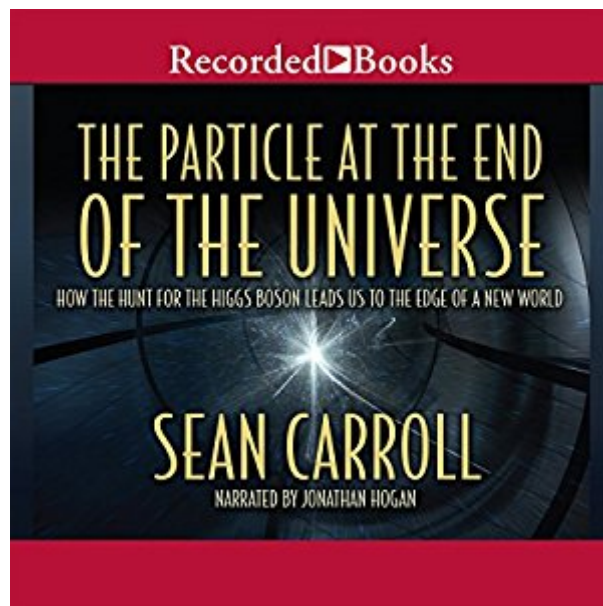


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# The Particle At The End Of The Universe: How The Hunt For The Higgs Boson Leads Us To The Edge Of A New World



## Synopsis

Scientists have just announced an historic discovery on a par with the splitting of the atom: The Higgs boson, the key to understanding why mass exists has been found. In *The Particle at the End of the Universe*, Caltech physicist and acclaimed writer Sean Carroll takes readers behind the scenes of the Large Hadron Collider at CERN to meet the scientists and explain this landmark event.

## Book Information

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## Customer Reviews

Many of us remember where we were during key world events; particle physicists would likely remember where they were on July 4, 2012. That was the day the Higgs boson was discovered at the Large Hadron Collider (LHC) in Geneva. By any measure it was one of the most momentous discoveries in physics, perhaps in all of science. But what exactly is the Higgs boson? Why is it important? And how was it discovered? In this engaging and informative book Caltech physicist Sean Carroll sheds light on all these aspects of the Higgs discovery. Carroll's book can be roughly divided into three parts. In the first part, after giving us a brief overview of particle physics describing relativity, quantum mechanics, the Standard Model and the discovery of the twelve elementary particles that make up the universe, Carroll plunges into a description of the giant particle accelerators that have made possible our understanding of nature's fundamental building blocks. Personally I found this part most enjoyable, since it's a little more accessible than the theoretical part. Carroll tells us about the stupendous engineering challenges involved in the building of the LHC and takes us on a nice little tour of its interior. There's all kinds of fascinating and amusing stuff here; the lead tungstate crystals in the detectors that took ten years to grow, the earlier particle

accelerator whose workings were affected by the moon's tides, the baguette dropped by a bird that temporarily created electrical problems, the helium "explosion" caused by high voltage that crippled the machine for months, the physicist whose face was exposed to an intense beam of protons and who still escaped relatively unscathed.

XXXXX"This is the story of the people who have devoted their lives to discovering the ultimate nature of reality, of which the Higgs [boson] is a crucial component. There are theorists, sitting with pencil and paper, fueled by espresso and heated disputes with colleagues, turning over abstract ideas in their minds. There are engineers, pushing machines and electronics well beyond the limits of existing technology. And most of all there are experimenters, bringing the machines and the ideas together to discover something new about nature. Modern physics at the cutting edge involves projects that cost billions of dollars and takes decades to complete, requiring extraordinary devotion and a willingness to bet high stakes in search of unique rewards. When it all comes together, the world changes."The above extract comes from the prologue of this extraordinary book by Dr. Sean Carroll. He is a theoretical physicist at the California Institute of Technology and an author. Note that in the above extract that a "boson" is a collective term for all particles that carry a force. For example, the photon (a particle of light) carries the electromagnetic force. The "Higgs" in Higgs boson is after British theoretical physicist Peter Higgs (born 1929). This book deals with science and thus reality. The Higgs boson helps humanity with reality by answering this question: Why do most particles have mass? Personally, I read this book to learn about the Higgs boson but found that this book is so much more. (This book treats July 4, 2012 as the day the discovery of the Higgs boson was announced. Actually, it was tentatively announced on this day.

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