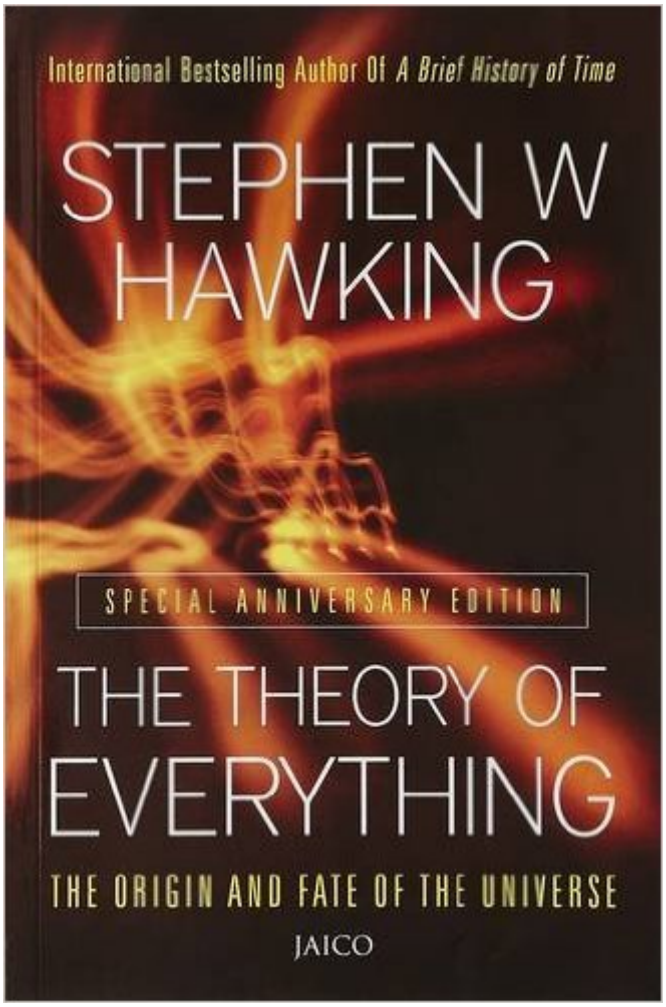
The Theory Of Everything



Synopsis

In this series of lectures Stephen W.Hawking tries to give an outline of what we think is the history of the universe from the big bang to black holes.The first lecture briefly reviews past ideas about universe and how we got to our present picture.One might call this the history of the universe. The second lecture describes how both Newton s and Einstein s theories of gravity led to the conclusion that the universe could not be static:it had to be either expanding or contracting.This,in turn,implied that there must have been a time between ten and twenty billion years ago when the density of the universe was infinite.This is called the big bang.It would have been the beginning of the universe. The third lecture talks about the black holes.these are formed when a massive star or an even larger body collapses in on itself under it s own gravitational pull.According to Einstein s general theory of relativity,any one foolish enough to fall into a black hole will be lost forever.they will not be able to come out of the black hole again.Instead,history,as far as they are concerned.will come to a sticky end at a singularity.However,general relativity is a classical theory that is,it does not take into account the uncertainity principle of quantum mechanics. The fourth lecture describes how quantum mechanics allows energy to leak out of black holes.Black holes are not as black as they are painted. The fifth lecture shall apply quantum mechanical ideas to the big bang and the origin of the universe.This leads to the idea that space-time may be finite in extent but without boundary or edge.It would be like the surface of the earth but with two more dimensions. The sixth lecture shows how this boundary proposal could explain why the past is so different from the future,even though the laws of physics are time symmetric. Finally,in the seventh lecture Stephen W.Hawking describes how we are trying to find a unified theory that will include quantum mechanics,gravity,and all oth

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Customer Reviews

"...minus several million for good thinking..."- Zaphod Beeblebrox, THE HITCHHIKER'S GUIDE TO THE GALAXYThe above quote (and the score I've assigned to this book) aren't in reference to the text or the author, but to the publishers. Why anyone with the brains of a sea urchin would cross Professor Hawking as they seem to have done is beyond me.Briefly, save your money and buy THE ILLUSTRATED BRIEF HISTORY OF TIME instead of THE THEORY OF EVERYTHING, even if you're a compulsive Hawking completist. Alert readers should notice that Hawking doesn't hold the copyright for THEORY OF EVERYTHING, and attempted to block its publication. It was originally titled THE CAMBRIDGE LECTURES: LIFE WORKS, and appears to have been drawn from some recordings of lectures given by the professor years ago. (See the professor's web site for details.)The "vanilla" (i.e., not the ILLUSTRATED) THEORY OF EVERYTHING consists of an introduction, seven lectures, and an index, without *any* illustrations or diagrams. Out of curiosity, I compared a library copy of it with THE ILLUSTRATED BRIEF HISTORY OF TIME.Unless otherwise noted, each of the 7 lectures corresponds to a chapter of the same name in BRIEF HISTORY, in some segments only with slightly different paragraphing and punctuation (and occasionally the kind of spelling errors that creep in when one transcribes audio narration to text, if I may speculate as to the cause).I don't understand why anyone would prefer the less polished text of THEORY OF EVERYTHING to THE ILLUSTRATED BRIEF HISTORY OF TIME, which not only has updates for new areas of research, but has been revised and rearranged to explain things more gently to the layperson."Ideas About the Universe" is essentially an extract from "Our Picture of the Universe", the first chapter of BRIEF HISTORY, with about one sentence's worth of drift per paragraph.BRIEF HISTORY's version of "The Expanding Universe" has a more gradual introduction to the methods of measuring distances to nearby stars, and explains technical terms that may be unfamiliar to the non-scientist, such as luminosity.THEORY OF EVERYTHING really shows its age in "Black Holes" when compared to BRIEF HISTORY, as Hawking has not been idle in that area over the years. The illustrated edition of BRIEF HISTORY has had a fair bit of interesting material added to "Black Holes", especially regarding cosmic censorship and naked singularities (Hawking having made a few *more* bets on the subject with Preskill and Thorne, although he paid off the Cygnus X-1 wager)."Black Holes Ain't So Black" lacks major blocks of clarification/explanation added by Hawking to the version in BRIEF HISTORY.BRIEF HISTORY's version of "The Origin and Fate of

the Universe" goes into more detail: about the kinds of particles that are predicted to have come out of the big bang, and what sort of results we'd expect to see today if the predictions hold, and the scientists who first put forward these theories. BRIEF HISTORY also contains a much longer version of the "open questions" section, leading more gradually up to the discussion of Guth's development of the inflationary model."The Direction of Time" corresponds to BRIEF HISTORY's "The Arrow of Time" (which is worth picking up just for the picture of the keeper of the U.S. cesium clock). BRIEF HISTORY goes into more detailed examples to explain what Hawking means by the psychological arrow of time, with the simplest kind of "computer": an abacus."The Theory of Everything" mainly corresponds to BRIEF HISTORY's more modestly titled "The Unification of Physics", which is much more up to date (string theories are still covered, but a lot more work has been done in that area over the years). The tail end of the lecture corresponds to the ending of BRIEF HISTORY's "Conclusion".--In summary, this is interesting stuff, but THE ILLUSTRATED BRIEF HISTORY OF TIME does it better.

Stephen Hawking's The Theory of Everything is a short book that can act as an introduction to the subjects of cosmology raised by modern science, but the book is only that; I preferred his Brief History of Time to this work because it was longer, more detailed, and covered more ground. If you are looking for a very basic introduction to the current thinking of astrophysicists, this is a good book; if you really want to wrestle with the subject at length, you should buy a Brief History of Time, or one of Paul Davies works, such as About Time. If you are looking for a good lecture series on physics, Richard Feynman's Six Easy Pieces and its sequel, Six Not So Easy Pieces is really the finest of this genre.That being said, the book does a good job in outlining the basic subject matter, discussing the development of the Big Bang theory, and the implications of both the general theory of relativity and quantum physics on the formation of the universe. Hawking is at his best when discussing singularities -- the points of the universe, such as black holes, where the laws of physics break down.

This is a collection of seven related lectures by Hawking originally published in 1996 under the title, The Cambridge Lectures: Life Works. He does not cover as much ground here as in did in A Brief History of Time, but what he does cover he does so in a charming and engaging style. There are some few statements here that could be interpreted as less than modest--although not by me--and a mistaken prediction or two, which may be a reason that Hawking is not pleased with this book's publication. He might also object to the title, since neither a "Theory of Everything" nor a conclusive

answer to the origin and fate of the universe are presented.However, Hawking does address these questions, and his expression is interesting to read and has the agreeable characteristic of being laconic. There are no equations in the book, no mathematics as such, and everything is explained in language that would be intelligible to a high school student. There are the usual droll Hawking jokes about God and His intentions, facetious, epigram-like understatements (I have done a lot of work on black holes, and it would all be wasted if it turned out that black holes do not exist. p. 66) and witty asides about the convergence of politics on physics, as when he mentions a particle accelerator the size of the Solar System that "would not be funded under current economic conditions."A good chunk of the book is devoted to black holes (about which Hawking is or was the world's foremost authority) and whether they have "hair" and "sweat" or not. Hawking avers on page 92 that if a primordial black hole is discovered "emitting a lot of gamma and X rays," he will get the Nobel Prize. This is an ironic lament since, as he explains later on, it is most likely that even if these very difficult to observe and very ancient black holes do exist, they are mostly evaporated by now, and so it is probable there will be no Nobel for Hawking.He also discusses a "no boundary condition" (p.119) of the big bang universe which seems to begin and end in a singularity in real-time while in imaginary time there are no singularities, just beginning and ending poles, like the north and south poles of the finite, unbounded surface of the earth. (p. 139) I especially like this idea since it does away with the infinite singularity and the theological implications that some draw from such a beginning of the universe. As Hawking asks rhetorically, in a "completely self-contained" universe with no boundary or edge--a universe "neither created nor destroyed"--what place would there be for a creator? (p. 126)He also addresses string theory, and I was pleased to read that he is no more enamored of all those little curled up dimensions than I am. He says the theory has several other problems that need to be worked out, not the least of which is that we still don't know whether all the infinities will cancel out. (p. 159)Hawking closes with his ideas about the prospect for a Theory of Everything. He gives three possibilities: (1) There is a "complete unified theory which we will someday discover..." (2) There's no ultimate theory, "just an infinite sequence of theories that describe the universe more and more accurately." (3) There's no theory, period: "Events...occur in a random and arbitrary manner." He seems to like (1) believing "that there is a good chance...[for] a complete unified theory by the end of the century..." Apparently--since he is speaking from circa 1996--he means the twentieth century. In that case he's wrong since we haven't yet gotten such a theory.For the record, I like (2). I think that our present "laws" are approximations that we will continue to improve on. I believe we develop the ability through science to better and better order our environment and to increase our knowledge. I don't believe we are actually discovering "ultimate truth."Hawking asks

here as he has elsewhere, "Why does the universe go to all the bother of existing?" Why is there anything at all? He believes that if we do discover a complete theory, we will then be able to answer this question, and then we would "know the mind of God."--Dennis Littrell, author of "Hard Science and the Unknowable"

Hawking clearly fleshes out his important findings in this book, but it’s essentially an abridged version of his earlier A Brief History of Time, and the recent The Universe In A Nutshell. His latest incarnation of singularity physics and grand unifying theory speculation offers no new research from the last three or so years, and virtually everything can be found in either A Brief History of Time or in Universe in a Nutshell. If you’re trying to meet a paper deadline, buy this book. Otherwise, read his more detailed and illustrated works for better comprehension

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