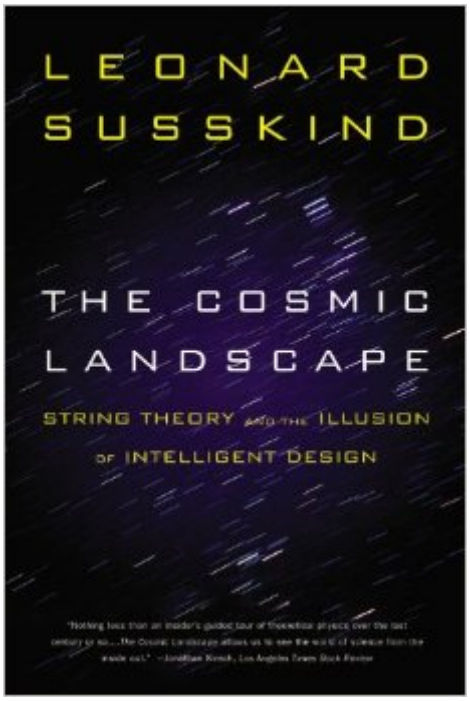
The Cosmic Landscape: String Theory And The Illusion Of Intelligent Design



Synopsis

In his first book ever, the father of string theory reinvents the world's concept of the known universe and man's unique place within it. Line drawings.

Book Information

Paperback: 416 pages

Publisher: Back Bay Books; Reprint edition (December 1, 2006)

Language: English

ISBN-10: 0316013331

ISBN-13: 978-0316013338

Product Dimensions: 5.5 x 1.2 x 8.2 inches

Shipping Weight: 13.4 ounces (View shipping rates and policies)

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Customer Reviews

Unlike the physicists who wrote the first two reviews, I don't know much 'bout string theory. Which is why I turn to books like this, or Greene's _The Elegant Universe_. Let me try to explain what this book is trying to do, and how, for one proverbial intelligent layman, it stacks up.Susskind is a man with a mission. What he's describing here is not settled science, but his own view of the direction fundamental physics should be trying to go. In order to describe that properly, of course, he has to explain a good deal of settled physics along the way. He does this engagingly and fairly clearly, though he doesn't have the truly remarkable expository gifts of Brian Greene, and I strongly recommend that anyone who wants to tackle this book should read _Elegant Universe_ first.The book has two tightly intertwined main theses. The first has to do with the Anthropic Principle: the observation that a large number of physical constants are required to fall within a surprisingly narrow range of values, in order for the apparatus of biology ever to appear. Slight tweaks to any of them would make galaxies, stars, atoms, chemical elements heavier than helium, to say nothing of carbon based life forms, impossible. Susskind's thesis here is that the AP is neither, as many theists would like to claim, evidence for a Designer who tailored the universe to make us possible; nor, as secular physicists would like to claim, an uninteresting tautology requiring no explanation. Rather, its

explanation is to be found in the last decades' developments in string theory.

This is an excellent book, by a clear writer, who has big ideas, and expresses them well. I recommend reading this book, then reading a critic of String theory, Lee Smolin's The Trouble With Physics.Leonard Susskind is the original inventor of String Theory over 25 years ago, and has now merged its latest permutations with Inflationary cosmology to produce a theory of everything. Susskind throughout the book talks about how he spends much of his time trying to figure out how to explain esoteric ideas in physics to laymen. I have an undergraduate degree in physics, and have read perhaps a dozen books on cosmology, and was able to follow this book fairly well. I am a "layman" compared to Susskind, but have a much stronger astrophysics background than most "laymen", so take warning. Understanding this book is not as easy as falling off a log.His starting point is that Fine Tuning is a legitimate argument - that our universe is fine tuned to create life to a bizarre degree. I will not present his rationale for Fine Tuning. He for many years rejected the Fine Tuning claims, but became convinced himself when the Cosmological Constant was shown to be very small but positive. Since the possible range of the CC is huge, and anything but zero or very close to zero values will lead to very short-lived universes, or ones with no matter concentrations, many physicists assumed that the CC was somehow forced to be zero, by unknown physics laws. That it is not was startling to astrophysicists, and for Susskind this was the last straw to support a Fine Tuning argument.There are two ways we know of to get Fine Tuning, design or evolutionary selection. Selection requires multiple random options to select between, and because he rejects Design, this is where Susskind goes.

Is this book just what I wanted? Well, what I think I really wanted was for Einstein to return to us today and write a book on the philosophy of modern physics based on today's understanding of things. Yes, that would have been just great! But Einstein is dead. Luckily, of course, there are some excellent physicists around, such as the author of this book.This book, written by an eminent String Theorist, has some fine explanations for the layman of some topics in modern physics, including String Theory. But the most interesting part is advertised in the title, namely the nature of the cosmic landscape.The cosmic landscape refers to the mathematical space which has as its elements the values of the "fields" that constitute the physical laws and constants which apply to a particular "universe" (with a small u) or "pocket universe" if one prefers that term. The idea is that there may be many possible sets of physical laws and constants. The more we discover about physics, the more it seems that there are plenty of possible universes. But do they really exist? That

is, is the landscape populated by more than our known universe? Is it heavily populated? The author argues that it is. And that certainly makes sense to me.We're told about the anthropic principle. At its simplest, this principle merely states that we have to live in a universe that permits intelligent life. That's not very profound. But this principle also suggests that there is indeed a landscape of possible universes, and it encourages us to verify that only a very small fraction of them would permit the kind of complexity required for intelligent life. And in fact, Susskind gives us a good example of this.