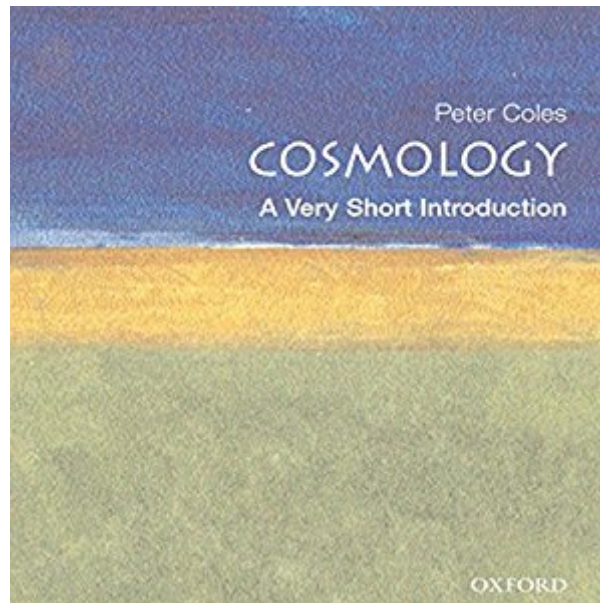




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# **Cosmology: A Very Short Introduction**



## Synopsis

What did happen in the Big Bang? How do galaxies come into beings? Is the universe speeding up? What is Dark Matter? What did trigger the disturbance of cosmic microwave background radiation? This book displays abstruse cosmology lively and colorfully, leading readers to feel the deepness of time and space and listen to the mysterious and amazing music of cosmos. --This text refers to an out of print or unavailable edition of this title.

## Book Information

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## Customer Reviews

It is very hard to write about such a complex subject in a few pages. This book manages to do it. Peter Coles gives a very brief, but thorough, introduction to this topic. I have read books that were over 500 pages long on the subject that did not cover as much. An amazing introduction to an amazing subject. If this does not stimulate you to explore further about the Cosmos, nothing else will.

This is an excellent qualitative expose' about current models of the universe. The author does a great job in presenting them with a minimum of mathematics. I would recommend it to anyone interested in the workings of the universe.

Rumination on the vastness and complexity of the universe may numb and overload 1k human brains. The thing is just so dang big. And here we are on our little molten dot gazing into the

seemingly impenetrable void. From the perspective of pure unaided observation nothing seems to make sense. Where are we, what are we, what the [explicative deleted] is the Universe anyway? And just where can tiny minds go to comprehend this behemoth?"Cosmology: A Very Short Introduction" would be a good starting place. Though it doesn't clear up the mystery of existence (what could?), it does provide a great overview of where humans stand in understanding the "great beyond." We still have a ways to go. The questions underlying cosmology have followed humanity for millenia. Though cosmology only became a pure empirical science within the last century. A brief overview of this developmental history opens the book. Starting from creation myths, described as anthropomorphic, this section follows the cosmological story from the Greeks to the modern era. Many big names appear: Thales, Pythagoras, Plato, Aristotle, Aquinas, Copernicus, Kepler, Newton, Olbers (of "Olber's Paradox"), Hubble, and Einstein, whose theories laid the foundation for the Big Bang. The majority of the book revolves around the successes and challenges of Big Bang cosmology. Einstein's Relativity theories broke the classic Newtonian mold by ousting the notion of absolute space and time. Relative simultaneity, time dilation, and the equivalence principle led to ideas of curved space-time (the book emphasizes how difficult these concepts are to visualize and understand; General Relativity's Rube Goldberg-esque equations don't make it easier). For better or worse, Einstein then "simplified" the Universe by introducing the Cosmological Principle (homogeneity and isotropy). This led him to posit a static, non-expanding Universe in 1917. By 1929 Hubble had presented data for an expanding Universe. Einstein's Relativity and Hubble's expansion provide the foundations for modern cosmology. But problems remain: singularities exist at the initial conditions and at black holes. Essentially, the mathematics break down into infinities at these points. Regardless, the Big Bang has seen great successes with the 1965 discovery of the cosmic microwave background (remnants of "the fireball") and the general distribution of Hydrogen, Helium-4, Deuterium, and Lithium-7 (the observations and calculations coincide). For the author, the successes apparently outweigh the difficulties, for he considers the Big Bang model "proven beyond all reasonable doubt." Other parts of the book delve into complex territory, but the discussions remain accessible throughout. Particle Physics (Leptons, Quarks, etc.) and the problem concerning Baryogenesis cover the micro scale of the cosmos. Then the problem of the value of Omega appears. This number will help determine whether the Universe will expand forever or eventually collapse in "the Big Crunch." The final section discusses "Theories of Everything" via Quantum Mechanics, "Schrödinger's Cat," Heisenberg's Uncertainty Principle, and the need for a quantum theory of gravity. Two attitudes towards such theories exist: Grand Unified Theories (GUTs) as explicating "the Mind of God" (Hawking) or, less dramatically, as descriptions or maps of reality. But

the author mentions problems with such theories in general, especially Gödel's Incompleteness Theorem. A final subsection discusses the Anthropic principle (along with its "strong" and "weak" variants; some consider forms of the "strong" version a suspicious derivation of Intelligent Design). This short book provides a great introduction to the basic principles of Cosmology. It remains readable, comprehensible, and accessible even when tackling very heady material. Some passages will confound newcomers, but that's expected given the subject matter. Vigilance will pay off. And though the book won't make anyone into a working cosmologist, it will allow the curious a glance at what scientists think our seemingly ineffable Universe comprises.

This is not the best of the very short introduction book on scientific subjects. It tries too hard to get around some points that require math and does not always end up with a clear explanation. If you have any technical background, look elsewhere including Sean Carroll CERN lectures.

This is a good general overview book. It's well written and covers the major topics of cosmology with good descriptions and easy language. If you are more scientifically inclined, than this book is probably too light to be of interest. However, if you are an amateur or just interested in the topic, this is a great overview. Easy read and very short.

In an introduction to a topic, one expects lots of figures to explain just about every topic. This book, and indeed the entire series, generally has rather few figures. The series also, generally, focuses on the historical development of the topic and not necessarily on the current understanding of the topic. Therefore, the series sacrifices a better explanation of our current understanding to explain who thought what and when. However, that is a matter of personal taste as to whether this is a digression or not. Nonetheless, this book serves adequately in the capacity of a "very short introduction."

excellent!

Easy to understand complex ideas.

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