

The Evidence of God in Physics

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Amazing discoveries in physics during the 20th century have revolutionized our understanding of the universe. Albert Einstein's General Theory of Relativity published in 1915 introduced a totally new scientific perspective to view the world. An analysis of Einstein's equations led Belgium physicist and Catholic priest George Lemaître to propose in 1927 that our universe is expanding, and it must have its origins in a finite point in time. Known eventually as the Big Bang Theory, the idea that universe had a beginning was met at first with skepticism. However, in 1929 American astronomer Edwin Hubble furnished the first scientific evidence that the universe is expanding based on his observation of galaxies using the giant telescope at Mount Wilson in California. In addition, "The discovery of the microwave radiation by Penzias and Wilson in 1965 also indicated that the universe must have been much denser in the past."¹ Thus Einstein's equations and Lemaître's model were confirmed. Under such convincing empirical evidences, the scientific community generally accepted the Big Bang as the best theory to date about the origin of the universe.

As the scientists studied the consequence of the Big Bang theory by tracing its origin to a finite point, they realized that a transcendent and omnipotent God is theoretically needed to bring the universe into being. In other words, there should be an outside agency that triggered the bang which started off the expanding universe. However, some scientists attempt to explain the origin without resorting to a God-hypothesis. They argue that the universe came into existence from

¹ Stephen Hawking, *The Theory of Everything: The Origin and Fate of the Universe* (New Millennium Press: 2002), 38.

physical laws. However, such theories of a “self-creating” universe remain unproven, and the theories that have evidence continue to point to the existence of God.

Among leading physicists who are in a quest for a theory that explains a spontaneous universe is Stephen Hawking. In 2002, he wrote in his book *The Theory of Everything*:

“So long as the universe had a beginning that was singularity, one could suppose that it was created by an outside agency. But if the universe is really completely self-contained, having no boundary or edge, it would be neither created nor destroyed. It would be simply be. What place, then, for a creator?”²

Hawking’s current views on this topic can be found in his latest book *The Grand Design* (2010), which he co-authored with the Caltech physicist Leonard Mlodinow. The authors attempt to offer a scientific explanation that excludes the necessity for a benevolent creator who set things in motion. Evaluating their arguments is a worthy exercise to undertake.

Scientific Determinism

The central argument the authors make in support for a Creator-free universe is scientific determinism. They write, “This book is rooted in the concept of scientific determinism, which implies that...there are no miracles, or exceptions to the laws of nature.”³ The second chapter of the book is titled “The Rule of Law,” and it argues that every aspect of the universe including human free will is a product of the laws of nature. Originally articulated by Laplace (1749-1827), scientific determination holds that “Given the state of the universe at one time, a complete set of laws fully determines both the future and the past.”⁴ This opens the possibility that science can predict the outcome of every event in the universe if the present state is known, from the motions of the universe’s large bodies to its tiniest atom. So, in theory a gambler would be able to determine with the help of a super computer whether an impending trip to a casino would be

² Ibid., 126.

³ Stephen Hawking, Leonard Mlodinow, *The Grand Design* (Bantam Books: New York, 2010), 34.

⁴ Ibid., 30.

worthwhile, bad news for Las Vegas. Hawking and Mlodinow not only don't limit the rule of law to the physical world, but claim: "scientific determinism must hold for people as well...It is hard to imagine how free will can operate if our behavior is determined by physical law, so it seems that we are no more than biological machines and that free will is just an illusion."⁵ Such an outlandish claim calls for refutation.

Applied to classical objects in everyday life, scientific determinism holds true. For example, the motions of the heavenly bodies, such as galaxies, sun, planets, etc., follow fixed orbits predicted by Isaac Newton's laws of gravity. Thus, physicists are able to predict cosmic events such as eclipses, supernovas, asteroid showers and so on. Thanks to the laws humans experience regular seasons and weather patterns. Thus the rule of law is evident in the macroscopic world in which humans operate. The Sun rises in the east and there is no room for surprise.

The Classical laws of physics including Einstein's General Theory of Relativity provide an accurate description of this world. However, as the scientists peaked into the atomic and subatomic world another reality of nature set in. Early twentieth century experiments have shown that at the microscopic level the state of particles such as atoms, electrons, etc. is unpredictable. To explain the behavior of these most fundamental building blocks of nature, quantum theory was developed. One of the celebrated quantum theories is Heisenberg's uncertainty principle which says "one can't know where an atom, or electron, or whatever, is located and know how it is moving, at one and the same time."⁶ However paradoxical this may sound, scientists gradually accepted the fact that at a fundamental level nature is unpredictable, a definite blow to determinism.

⁵ Ibid., 32.

⁶ Paul Davies, *God & The New Physics* (New York: Simon & Schuster, 1983), 102.

Even Hawking acknowledged this fact in one of his earlier books *A Brief History of Time*: “The uncertainty principle signaled an end to Laplace’s dream of a theory of science, a model of the universe that would be completely deterministic.”⁷ Yet his new book ignores this fact and makes the assertion that the book is rooted in the concept of scientific determinism. Is Hawking contradicting himself? His reasoning can be found in what he writes following the quote in *A brief History of Time*:

“One certainly cannot predict future events exactly if one cannot even measure the present state of the universe precisely! We could still imagine that there is a set of laws that determines events completely for some supernatural being, who could observe the present state of the universe without disturbing it. However, such models of the universe are not of much interest to us ordinary mortals.”⁸

The intention of Hawking is clear. Determinism is the only path that can lead to a model of a universe that does not require supernatural input. He is clearly aware that the premise of determinism is shattered by the intrinsic uncertainty of nature. His quote mentioned earlier from his classic book *A Brief History of Time* (1988) clearly alludes to this fact. However, his new book makes the following modification:

“Quantum physics might seem to undermine the idea that nature is governed by laws, but that is not the case. Instead it leads us to accept a new form of determinism: Given the state of a system at some time, the laws of nature determine the probabilities of various futures and pasts rather than determining the future and past with certainty” (*The Grand Design*, 72).

The revision of quantum mechanics appears to salvage determinism from total extinction. Nonetheless, *The Grand Design*’s dogmatic assertion of determinism, which is shown to be not absolute, sets off alarm. Even more troubling is the statement mentioned earlier that humans are no more than biological machines and that free will is just an illusion (*The Grand Design*, 32). Again, the authors are not consistent with this assertion too. In the very next paragraph, the

⁷ Stephen Hawking, *A Brief History of Time: From the Big Bang to Black Holes* (Bantam Books: New York, 1988), 55.

⁸ Ibid.

readers are told, “In the case of people, since we cannot solve the equations that determine our behavior, we use the effective theory that people have free will” (*The Grand Design*, 33). In effect, the authors admit the limitation of physics to encompass the whole of reality, giving the readers cause for reservation concerning the model of the universe which their book proposes.

The Grand Design: A Product of Pure Chance?

Hawking and Mlodinow propose that the origin of the universe was a quantum event: “Our picture of the spontaneous quantum creation of the universe is then a bit like the formation of bubbles of steam in boiling water” (*The Grand Design*, 135-136). Just as the bubbles appear and disappear, the authors imagine that universes come and go. Our universe happened to be one of those that survived long enough to develop galaxies and stars, and finally intelligent life. Further, they explain that, like the waves in a pond, our universe does not have just a single existence or history, but rather that every possible history of our universe exists simultaneously, each having its own physical laws. In one version of such histories, the physical laws were precise enough to produce intelligent life.

But, the authors don’t explain where those laws come from. In a nutshell, the authors say that we are a product of randomness. To replace God in creation, the authors invoke the infinity of universes. Surprisingly, no convincing proofs are given to support their elaborate scheme. They write, “more precise measurements are needed to fully differentiate the top-down theory from others, and to either support or refute it. These may well be carried out by satellites in the future.”⁹ Paul Davies’s response aptly refutes this claim, “one might find it easier to believe in an infinite array of universes than in an infinite Deity, but such a belief must rest on faith rather than observation.”¹⁰

⁹ Ibid., 143.

¹⁰ Davies, 174.

The Grand Design also devotes a chapter to discuss the fine-tuning of our universe, the conditions that are necessary to sustain life. What makes life possible in our universe is a wide range of factors including the position of the earth's location in the inhabitable zone of the solar system, earth's axis of rotation relative to the plane of its orbit that provides regular seasons, the chemical make-up of the cosmos conducive for the development of carbon-based life, various constants such as gravitational constant, cosmological constant, and so on. A slight variation in any of these factors makes the development of life impossible. Calling these "lucky coincidences," Hawking and Mlodinow assert that "the fine-tunings in the laws of nature can be explained by the existence of multiple universes."¹¹ The readers must be disappointed to know that *The Grand Design* comes down to what Hawking originally wrote in 1988 in his classic book:

"If the universe is indeed spatially infinite, or if there are infinitely many universes, there would probably be some large regions somewhere that started out in a smooth and uniform manner. It is a bit like the well-known horde of monkeys hammering away on typewriters—most of what they write will be garbage, but very occasionally by pure chance they will type out one of Shakespeare's sonnets."¹²

Conclusion:

The Big Bang Theory offers the best scientific explanation for the origin of the universe. It satisfactorily explains how the present state of the universe came about from a singularity. The scientists are divided in their opinions on what caused the singularity. The best plausible explanation is to see the universe as the work of God. Attempts to prove otherwise lead to theories that rely on pure chance as seen in the book *The Grand Design*. However, such theories lack evidence and remain unproven.

¹¹ *The Grand Design*, 165.

¹² *A Brief History of Time*, 123.

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