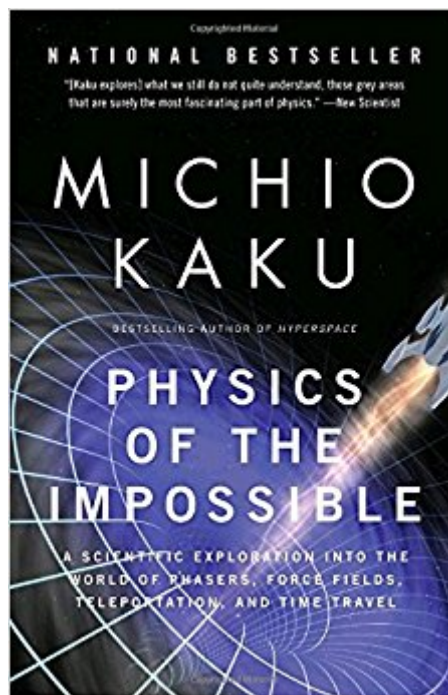




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# Physics Of The Impossible: A Scientific Exploration Into The World Of Phasers, Force Fields, Teleportation, And Time Travel



## Synopsis

Teleportation, time machines, force fields, and interstellar space ships – the stuff of science fiction or potentially attainable future technologies? Inspired by the fantastic worlds of Star Trek, Star Wars, and Back to the Future, renowned theoretical physicist and bestselling author Michio Kaku takes an informed, serious, and often surprising look at what our current understanding of the universe's physical laws may permit in the near and distant future. Entertaining, informative, and imaginative, *Physics of the Impossible* probes the very limits of human ingenuity and scientific possibility.

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## Customer Reviews

In this latest effort to popularize the sciences, City University of New York professor and media star Kaku (*Hyperspace*) ponders topics that many people regard as impossible, ranging from psychokinesis and telepathy to time travel and teleportation. His Class I impossibilities include force fields, telepathy and antiuniverses, which don't violate the known laws of science and may become realities in the next century. Those in Class II await realization farther in the future and include faster-than-light travel and discovery of parallel universes. Kaku discusses only perpetual motion machines and precognition in Class III, things that aren't possible according to our current understanding of science. He explains how what many consider to be flights of fancy are being made tangible by recent scientific discoveries ranging from rudimentary advances in teleportation to the creation of small quantities of antimatter and transmissions faster than the speed of light.

Science and science fiction buffs can easily follow Kaku's explanations as he shows that in the wonderful worlds of science, impossible things are happening every day. (Mar. 11) Copyright © Reed Business Information, a division of Reed Elsevier Inc. All rights reserved. --This text refers to an out of print or unavailable edition of this title.

Kaku (Parallel Worlds, Beyond Einstein, Hyperspace) introduces complex theories of physics to general readers. As The Economist notes, Kaku "makes a good stab at explaining difficult physics. But his grasp of his subject is perhaps trumped by his knowledge of science fiction." While Kaku writes in language designed to captivate nonscience readers, it's his references to pop culture—Star Trek to Terminator 3—that clarify his fringe physics. (Those wishing to explore the topic further can refer to Kaku's detailed footnotes.) To critics' delight, Kaku also investigates the moral issues of futuristic technology that SF does so well and asks provoking questions about the fate of humankind. The only complaints? Kaku omits a few obvious SF parallels, and, more seriously, readers who don't enjoy that genre may find less of interest here. Copyright © 2004 Phillips & Nelson Media, Inc. --This text refers to an out of print or unavailable edition of this title.

When the author appeared at a convention I attended last year I was surprised not to have heard of him as he was listed as a NY Times best seller. I was impressed enough with his talk to order a couple of his books, this one among them. He divides phenomena into 3 levels of the impossible. Class I impossibilities are those that are "impossible today but that do not violate the known laws of physics." Examples would include teleportation, antimatter engines and "certain forms of telepathy, psychokinesis and invisibility." Class II phenomena include those that "sit at the very edge of our understanding of the physical world" and include time machines, travel through wormholes and hyperspace travel. The final category, III, includes "technologies that violate the known laws of physics" and include precognition and perpetual motion machines. I thoroughly enjoyed the references to Star Wars movies, Star Trek episodes and various pieces of well known science fiction literature. If you are the type who enjoys mind benders like "... the true secret of anti-matter: it's just ordinary matter going backward in time" and who can get excited about the LISA program scheduled for next year which "consists of 3 satellites circling the sun, arranged in a triangle, each connected by laser beams 3 million miles long ... orbiting the sun about 30 million miles from earth ... able to detect vibrations to within one part in a billion trillion, about 1/100th the size of an atom" in search of gravity waves, then this is probably a book you will enjoy. And nary a math equation

anywhere! I had a good time with it.

"In principle the ramjet engine could propel itself indefinitely, ultimately reaching distant star systems in the galaxy ... In theory, the spacecraft might be able to reach the limit of the visible universe within the lifetime of the crew member (although billions of years might have passed on Earth).  
"A universe in which left and right are reversed, matter turns into antimatter, and time runs backward is a fully acceptable universe obeying the laws of physics!"  
PHYSICS OF THE IMPOSSIBLE "... a universe in which left and right are reversed, matter turns into antimatter, and time runs backward is a fully acceptable universe obeying the laws of physics!"  
PHYSICS OF THE IMPOSSIBLE is a speculative work on the possibility (or not) of realizing what the current state of the Science of Physics considers impossible. Its author, Michio Kaku, is a theoretical physicist who helped define String Theory. On the other hand, physics and differential calculus quickly phasered my desire to become an aeronautical engineer back in the 60s. So, you might think that Kaku's book and I would be a poor match inasmuch as I turned out to be a Life Sciences kind of guy. Well, not necessarily. Michio begins his fascinating discussion by dividing what is "impossible" into three classes. Class I (force fields, invisibility, phasers, death stars, teleportation, telepathy, psychokinesis, robots, starships, antimatter engines) includes those concepts, while unattainable today, may be possible this century or the next. Class II (faster than light speeds, time travel, entry into parallel universes), at the edge of current understanding, may be realized millions of years in the future. Nothing in these two categories violates the known laws of physics. Class III (perpetual motion machines and precognition) violates the known laws of physics and would require a paradigmatic shift. Most important to my appreciation of the subject matter, the author explains everything at a level that can be (mostly) understood by us Just Folks who could barely manipulate a slide rule back in the day. And except, as I recall, only one or two mentions of Einstein's famous  $E = (m)(c \text{ squared})$ , he doesn't speak in equations at all. Granted, when Kaku starts in about the eleven dimensions and multiverses allowed for by String Theory, the subject matter perhaps recedes over my comprehension's event horizon, but I figure he's allowed. He's earned it. One can only imagine the advances in physics since this book was copyrighted in 2008. Can Scotty now beam me up, I wonder? As with *The Hidden Reality: Parallel Universes and the Deep Laws of the Cosmos* by Brian Greene, PHYSICS OF THE IMPOSSIBLE will perhaps open-up the reader's mind to a sense of wonder. Ever since the Caveman first gazed up into the night sky uncontaminated by any light and thought "Dude!", such a mental epiphany is an experience to be savored.

So how long do we have to wait for Star Trek like teleporters, Back to the Future hover boards or giant Death Star like planet destroying lasers? How about Terminator type intelligent robots, reproducing nano-bots and trips to other star systems? Will we ever be able to go back in time or slip into an alternate universe? Michio Kaku combines popular science fiction and current theoretical physics to speculate on how, if and when we can expect to see these kinds of fantastic technologies. This book is a ton of fun. It's fascinating to read how future scientists might construct a working force field or a feasible starship. The author answers a few questions that I've long wondered about, for instance, how does one store anti-matter if it's annihilated the moment it comes into contact with matter. This is exactly the kind of book that got me back into reading several years ago, a pop science book on the future of technology. It's an easy read with no mind numbing formulas or diagram, written for the total layman. I have read literally dozens of popular science books in the last decade and this is one of the better ones. The big problem with these kinds of books is that physics hasn't had a major new breakthrough since well before I was born and these books can get rather repetitive. Sure there have been lots of minor advancements but the main problem of physics, the elusive Grand Unifying Theory remains unsolved. One portion of the book that troubled me was a discussion on string theory as the most likely solution to the unification of relativity and the special model. Read 'The Trouble with Physics' by Lee Smolin to see how shaky the foundation of string theory really is. Michio writes, 'one major criticism of string theory is that it is untestable'. Actually the much bigger problem is that it's unfalsifiable which puts it dangerously close to pseudoscience. Another criticism he mentions is that by putting string theory at such a high priority in physics other avenues of thinking are squeezed out. To this Michio just smiles accepting this as a natural occurrence in research but I would argue that this kind of attitude may be one of the reasons physics has been practically paralyzed for decades. The author writes that, "The coming years of physics could be the most exciting of all, as we explore the universe with a new generation of particle accelerators, space based gravity detectors and new technologies" My suspicion is that the coming years of physics will generally be exciting only particle physicists and astronomers not the general public. Books like 'The Physics of Impossible' are enjoyable to read but if you peruse one every couple of years you can probably keep up with advancements in the latest massive science experiments and particle discoveries.

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