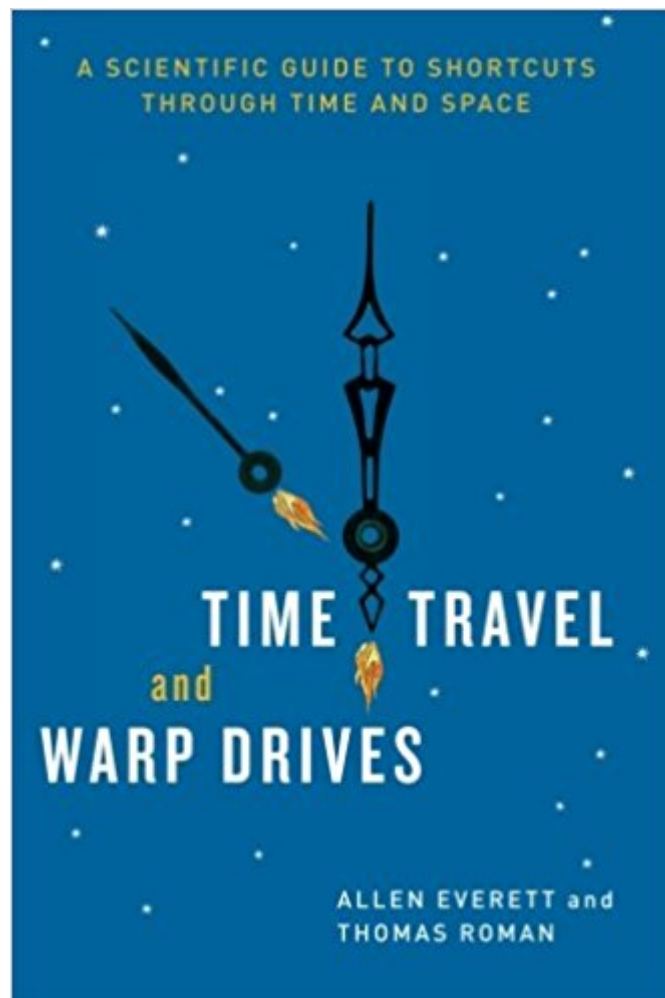




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# Time Travel And Warp Drives: A Scientific Guide To Shortcuts Through Time And Space



## Synopsis

To see video demonstrations of key concepts from the book, please visit this website:

<http://www.press.uchicago.edu/sites/timewarp.index.html>. Sci-fi makes it look so easy. Receive a distress call from Alpha Centauri? No problem: punch the warp drive and you're there in minutes. Facing a catastrophe that can't be averted? Just pop back in the timestream and stop it before it starts. But for those of us not lucky enough to live in a science-fictional universe, are these ideas merely flights of fancy or could it really be possible to travel through time or take shortcuts between stars? Cutting-edge physics may not be able to answer those questions yet, but it does offer up some tantalizing possibilities. In *Time Travel and Warp Drives*, Allen Everett and Thomas A. Roman take readers on a clear, concise tour of our current understanding of the nature of time and space and whether or not we might be able to bend them to our will. Using no math beyond high school algebra, the authors lay out an approachable explanation of Einstein's special relativity, then move through the fundamental differences between traveling forward and backward in time and the surprising theoretical connection between going back in time and traveling faster than the speed of light. They survey a variety of possible time machines and warp drives, including wormholes and warp bubbles, and, in a dizzyingly creative chapter, imagine the paradoxes that could plague a world where time travel was possible—killing your own grandfather is only one of them! Written with a light touch and an irrepressible love of the fun of sci-fi scenarios—but firmly rooted in the most up-to-date science, *Time Travel and Warp Drives* will be a delightful discovery for any science buff or armchair chrononaut.

## Book Information

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## Customer Reviews

"Marvelously accessible." (Chicago Tribune) "Relying only minimally on technical jargon and formulas, the authors open to view the exciting conceptual prospects for designing a time machine capable of slipping backward through the centuries and of riding faster-than-light warp bubbles through the cosmos.... Armchair scientists share the thrill of peeking into the universe's deepest secrets. Penetrating science illuminates humankind's most audacious dreams." (Booklist)"

Allen Everett is professor emeritus of physics at Tufts University. Thomas Roman is a professor in the Mathematical Sciences Department at Central Connecticut State University. Both have taught undergraduate courses in time-travel physics.

A great read, much more on Special and General Relativity than on actual time travel. Time travel is used as a theme to discuss physics. Several reviewers complain about the math in the book. Actually the math is very minimal and easy. The difficulty of the book, as any work on topics concerning Relativity and Quantum Theory, is that the concepts are so much counter-intuitive that the reader must revert to a level of abstract thinking that many of us are not used to. I must admit that several of the discussions in the book I do not fully grasp. But overall a great read, explaining that Warp Drive, for now, is still a long way away. Folkert [www.ExcitingTechnology.net](http://www.ExcitingTechnology.net)

Good read that attempted to speak in non-physicist language, but was still crammed with equations and theoretical models. Not light reading.

This is an excellent hard science based book on possible time travel via worm holes, warp drives, time machines and the like. The authors' conclusion that backward time travel seems to be extremely unlikely is rather depressing, but who knows, maybe dark energy turns out to be exotic material, or a quantum theory of gravity may revolutionize our understanding and overrule Hawking's chronology protection conjecture.

A book that is easy to read without the need for indepth technical knowledge. Raises many questions science has a long way to go to answer.

The authors have set before themselves a very ambitious task: that of explaining physics that is nearly inexplicable to students or readers with very little background in physics. As someone with a B.S. degree in physics, graduate degrees in engineering (including graduate level physics courses), who has published papers using modern physics, and continues to read textbooks on quantum physics and quantum field theory (but not general relativity)--I find this book quite challenging. That said, I do not wish to scare off the reader who is neither a professional scientist or holder of advanced degrees in physical science or engineering. The authors do succeed in explaining a great deal without the use of mathematics beyond high school algebra. Nevertheless, there are many advanced concepts, ranging from general relativity to quantum physics that are addressed in a sophisticated way that would challenge any reader who is not well versed in these topics. I have the advantage to have been acquainted with one of the co-authors, and remember him as one of the most engaging raconteurs who I have had the pleasure to know. I can well imagine that he is able to engage even liberal arts majors with little previous background in physics and impart many of the concepts in this book in a meaningful way. For the solitary reader, however, making your way through this book without the enthusiastic author at your elbow would be rather more difficult. Certainly this book is accessible to anyone with a B.S. degree in physics. Most advanced undergraduates working towards a degree in physical science or engineering (especially those who have taken a two-semester junior level modern physics course) would benefit from this book. Many Freshman physics majors would also find much in this book that they can understand. Even a very bright high school senior who has read a college physics textbook on his own, or had a good high school physics course, would find this book delightful. For a professional researcher, academic, or talented amateur with a deep background in physics, this book is essentially a map to an intellectual gold mine. The authors provide many references to published journal articles, that would benefit the reader with access to a research library (or perhaps even the basic internet, as important research papers are sometimes available for free from university or Wikipedia websites). Even more importantly, the authors provide a sufficiently broad overview of exotic space and time travel for the reader to be able to choose which avenue he might wish to pursue further. As for the content of this 278-page book, the first 100 pages provide a rudimentary introduction to Einstein's theories of Special and General Relativity--at a level accessible to college Freshmen with a good high-school physics background. The second part of the book addresses more difficult topics--especially the potential role and properties of "exotic matter" (i.e. matter with "negative mass") in configuring wormholes or warp bubbles that allow superluminal (i.e. faster than light) space travel. The topic of parallel universes is discussed--touching on Hugh Everett's "Many Worlds" interpretation of

quantum mechanics, and the time travel paradoxes that might be avoided by confining your activities to an adjacent parallel universe. The names and contributions of many physicists working in this field are mentioned, giving the reader a better feel for the research community enjoyed by the authors. As for how this book has influenced my ideas about the technology of Star Trek, I now imagine Scotty saying something like "Captain, I fear that the confinement of the exotic matter bounding our warp bubble is about to fail!" Though, in reading this book, I gleaned that there is precious little the crew of the Enterprise could do to avert (or even anticipate) such a calamity!

Is it possible to travel to the past? The answer given by Einstein's theory of relativity is "in principle, yes", and physicists have been working hard trying to figure out what it would take to build a time machine. The authors of this book, who are both leading experts in this area, will be your amiable and completely reliable guides into the world of time travel. The book is beautifully written and is truly a pleasure to read. The first half of the book introduces the ideas of special and general theories of relativity, which are essential for the understanding of this subject. The second half discusses different types of time machines, the conditions for their existence, and ways to avoid some perplexing paradoxes associated with time travel. Following this discussion will require some concentration, but you will be rewarded with not only learning the conclusions of modern physics regarding time travel, but also with a good insight into how those conclusions have been reached.

The material was sometimes too repetitive in detail and I simply lost focus. I'm a mechanical engineer so it's not that I can't appreciate or understand concepts and simple algebra. It's just that it too often caused me to think about the sky or the weather instead of thinking about the content. Who knows, it could be me.

The other reviewers have praised the book for its content. While I pretty much agree with them, I don't think the book is worth spending money on. Check out a copy from your local library. I can't recommend a reader purchasing this book because too much of the information in it is available for free from other sources such as the public library and the internet. This book just puts it all together in one location. One warning, if you're a science fiction writer wanting to put a little science into your FTL drive or your time machine this book isn't going to help you. Read it because you're actually interested in the subjects covered.

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