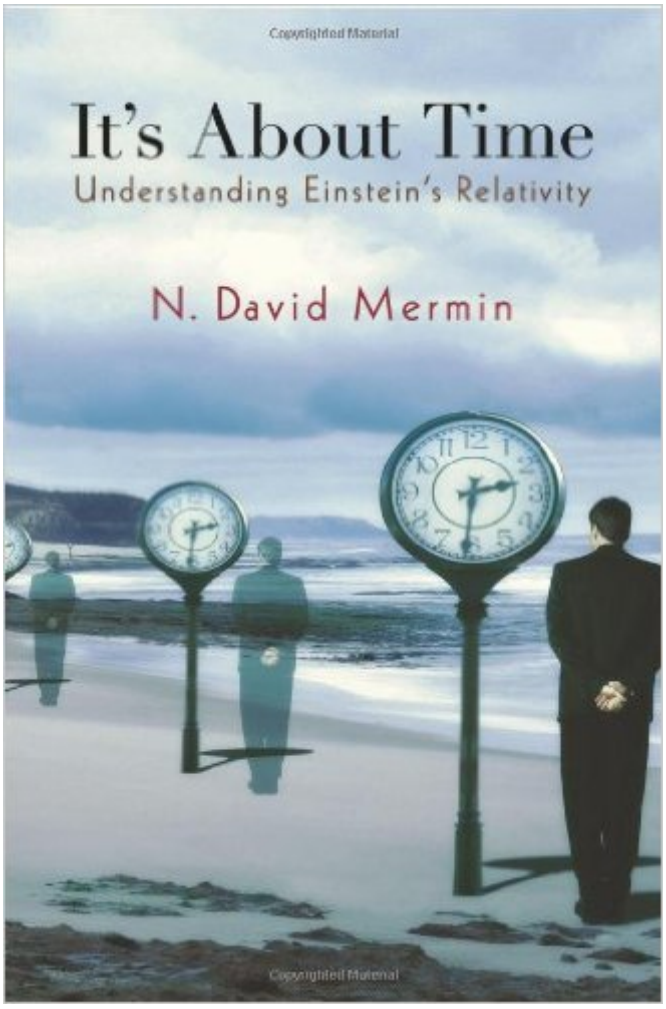
It's About Time: Understanding Einstein's Relativity



Synopsis

In It’s About Time, N. David Mermin asserts that relativity ought to be an important part of everyone’s education--after all, it is largely about time, a subject with which all are familiar. The book reveals that some of our most intuitive notions about time are shockingly wrong, and that the real nature of time discovered by Einstein can be rigorously explained without advanced mathematics. This readable exposition of the nature of time as addressed in Einstein’s theory of relativity is accessible to anyone who remembers a little high school algebra and elementary plane geometry. The book evolved as Mermin taught the subject to diverse groups of undergraduates at Cornell University, none of them science majors, over three and a half decades. Mermin’s approach is imaginative, yet accurate and complete. Clear, lively, and informal, the book will appeal to intellectually curious readers of all kinds, including even professional physicists, who will be intrigued by its highly original approach.

Book Information

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Customer Reviews

This book was produced from the lectures given for many years by the author for a course on Relativity that was given to Cornell University non-science majors. Aimed at an audience of non-scientists one would expect a watered-down, simplified book. While only basic algebra is utilized, with the introduction of almost no Physics, this is far from a watered-down or simple book. As the author clearly states, this in not a book that can be read like a novel. It requires deep concentration and a lot of patience to follow what is presented, but in the end the reader is rewarded for their efforts with a deeper understanding of what the Einstein’s Theory of Relativity is all about-

it’s all about time. I have previously read the general treatments of relativity written by Einstein, Martin Gardner, Richard Wolfson, David Bohm, Max Born and the sections on relativity in Richard Feynman’s physics text. Even with a considerable background I found a new understanding of the subject.Unlike most relativity books, this one does not start with the reason’s why Einstein developed a new way of looking at time and space and in doing so overturned Newton’s ideas of time and space. The book focuses on the problem of examining events from different frames of reference, and in doing so develops the ideas of relativity without any detailed physics arguments, beyond the idea that the speed of light is the same for all observers, regardless of their velocity. The arguments are all logical and geometrical. Gradually one learns how events may or may not be simultaneous when viewed in the same or different frames of reference, how velocities combine, how time measured on a clock can be a function of the velocity at which the clock moves and how this leads to new concepts of space and time - to space-time.

When curious but less mathematically inclined students ask me for a book on relativity, this is one of two that I usually point them to. The other is Takeuchi’s An Illustrated Guide to Relativity. The two books are fairly similar in that they both present special relativity from a heavily visual and geometrical point of view. Takeuchi has cute cartoons and is nonthreatening. Mermin’s book is deeper and more rigorous, and also a lot less entertaining. By analogy, there are many historical anecdotes about famous figures such as Abraham Lincoln who put significant time into mastering Euclid’s Elements in depth. This is the type of person who will like Mermin’s book. (For those who just want armchair reading, Gardner’s Relativity Simply Explained is wonderful, although painfully out of date when it comes to certain topics such as black holes and, especially, cosmology.)Mermin has spent many years at Cornell teaching a course on relativity for students who are not science majors. His presentation is highly polished. If you want to get an idea of how Mermin’s book is structured, a pretty complete presentation of the same ideas is available from his Cornell web page. (I don’t think will let me include a URL, but you can find it by googling.)Mermin is similar to Takeuchi in that both books do a good job in their first halves of presenting relativistic kinematics, and both, in my view, start to get bogged down in the second half, where they deal with dynamics. Mermin discusses the link between conservation of momentum and the frame-independence of conservation of energy; this will go way over the heads of typical students in a gen ed class. I strongly dislike the discussion of relativistic momentum.

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