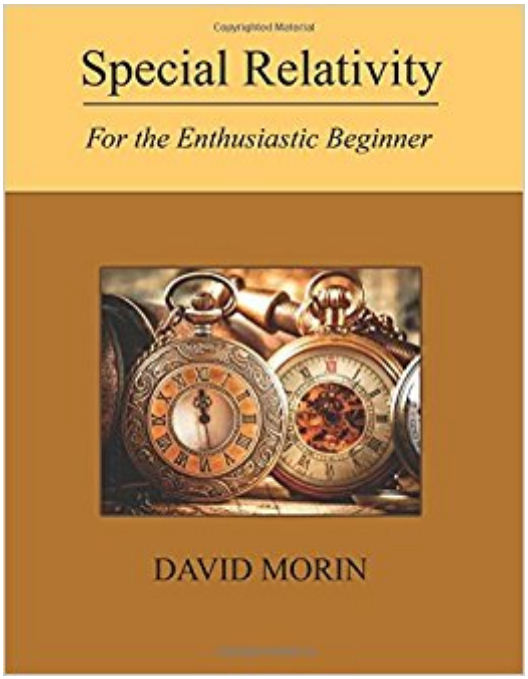
Special Relativity: For The Enthusiastic Beginner



Synopsis

This book is written for high school and college students learning about special relativity for the first time. It will appeal to the reader who has a healthy level of enthusiasm for understanding how and why the various results of special relativity come about. All of the standard introductory topics in special relativity are covered: historical motivation, loss of simultaneity, time dilation, length contraction, velocity addition, Lorentz transformations, Minkowski diagrams, causality, Doppler effect, energy/momentum, collisions/decays, force, and 4-vectors. Additionally, the last chapter provides a brief introduction to the basic ideas of general relativity, including the equivalence principle, gravitational time dilation, and accelerating reference frames. The book features more than 100 worked-out problems in the form of examples in the text and solved problems at the end of each chapter. These problems, along with the discussions in the text, will be a valuable resource in any course on special relativity. The numerous examples also make this book ideal for self-study. Very little physics background is assumed (essentially none in the first half of the book). An intriguing aspect of special relativity is that it is challenging due to its inherent strangeness, as opposed to a heavy set of physics prerequisites. Likewise for the math prerequisite: calculus is used on a few occasions, but it is not essential to the overall flow of the book.

Book Information

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Customer Reviews

David Morin is a Lecturer and the Associate Director of Undergraduate Studies in the Physics Department at Harvard University. He received his A.B. in mathematics from Brown University and his Ph.D. in theoretical particle physics from Harvard University. He is the author of five books, including Introduction to Classical Mechanics (Cambridge University Press, 2008), Electricity and

Magnetism (Cambridge University Press, co-author, 2013), and Probability: For the Enthusiastic Beginner (2016). When not writing textbooks, thinking of physics limericks, or conjuring up new problems whose answers involve e or the golden ratio, he can be found running along the Charles River or hiking in the White Mountains of New Hampshire. Resources for his books, along with other educational material, can be found on his Harvard webpage.

WOw, I just finished looking at this book -- it’s awesome! I’m currently taking modern physics and we’re getting hammered with special relativity. Our course textbook is just ok, not enough worked-out problems. For extra problems, our instructor suggested we purchase Schaum’s outline for Modern Physics -- lots of problems, but it’s either too basic or too high level, no in-between.Earlier this week I started using this Special Relativity book by this Harvard professor and it’s awesome!! It has A LOT of worked out problems. In fact the explanations are so clear that it has now replaced my textbook for the course. Two of my friends started using it yesterday before our Pset was due and they love it. For fun I just read a bit from the 4-vector chapter at the end and I think I understand :) This book is awesome. Thank you, you’re a life saver!!!

Detailed, step-by-step proofs and excellent worked examples and diagrams.

I’m using this for self-study and so far, while the exercises are challenging, it provides a great deal of insight into SR that I didn’t get in High School.In particular, I like that the author provides explanations against common pitfalls in understanding. The explanation that magnetism results from SR of the electric field was mindblowing and that was just in the first section! Would definitely recommend this to someone looking to understand SR, or would like to stretch their minds to understand how first-principles thinking of a strange postulate (speed of light is constant in all reference frames) can provide completely un-intuitive results that, despite "common sense", have been verified by experiment over and over.For self-study, I would suggest reading through the explanations once and then struggling with the problems as soon as you can, going back to the explanations as reference. And of course, only read the solutions until you have struggled hard with the problem (preferably only when you are 99% sure you are right!)

A great book to start with if you want to learn about Einstein’s Special Relativity. The book uses math that is approachable to anyone with a good foundation in Algebra and Trigonometry. The subject is explained by using thought experiments and then supported by the mathematics. The

derivations of the equations for topics such as Time Dilation, Length Contraction, the Lorentz Contraction etc. are throughly explained and shown in the text. The problem sets enforce the information contained in the sections and are presented as completed examples so that the student can see how the problem was approached and worked out.

A very digestible primer for those interested in special relativity. The material is presented in a fashion that would be accessible to a gifted HS student or the average physics undergrad. Lots of worked examples and problem sets complement the text.

Great source of advanced problems in relativistic mechanics together with the nicely explained theory. Useful book for physics contests and olympiads.

Special Relativity: For the Enthusiastic Beginner The Road to Relativity: The History and Meaning of Einstein's "The Foundation of General Relativity", Featuring the Original Manuscript of Einstein's Masterpiece Theory of Relativity for the Rest of Us but not for Dummies: Theory of Relativity Simplified The 10-Minute Retriever: How to Make an Obedient and Enthusiastic Gun Dog in 10 Minutes a Day Blacksmithing : Ultimate Blacksmithing Beginners Guide: Easy and Useful DIY Step-by-Step Blacksmithing Projects for the New Enthusiastic Blacksmith, along ... To Blacksmith,How to Make a Knife,) Relativity: The Special and the General Theory Space and Time in Special Relativity Relativity; the Special and General Theory Transformations Of Coordinates, Vectors, Matrices And Tensors Part I: LAGRANGEÃ¢â ¬â„¢S EQUATIONS, HAMILTONÃ¢â ¬â„¢S EQUATIONS, SPECIAL THEORY OF RELATIVITY AND CALCULUS ... Mathematics From 0 And 1 Book 16) Relativity: The Special and General Theory [New Edition with Readable Equations] Relativity: The Special and the General Theory, 100th Anniversary Edition From Special Relativity to Feynman Diagrams: A Course in Theoretical Particle Physics for Beginners (UNITEXT for Physics) Theoretical Physics 4: Special Theory of Relativity Newton to Einstein: The Trail of Light: An Excursion to the Wave-Particle Duality and the Special Theory of Relativity Special Relativity Special Relativity (M.I.T. Introductory Physics) Introduction to Special Relativity Relativity: The Special and General Theory [Illustrated] French-English/English-French Beginner's Dictionary: A Beginner's Guide in Words and Pictures (Barron's Beginner's Bilingual Dictionaries) Knife Fighting, Knife Throwing for Combat (Special Forces/Ranger-Udt/Seal Hand-To-Hand Combat/Special W)