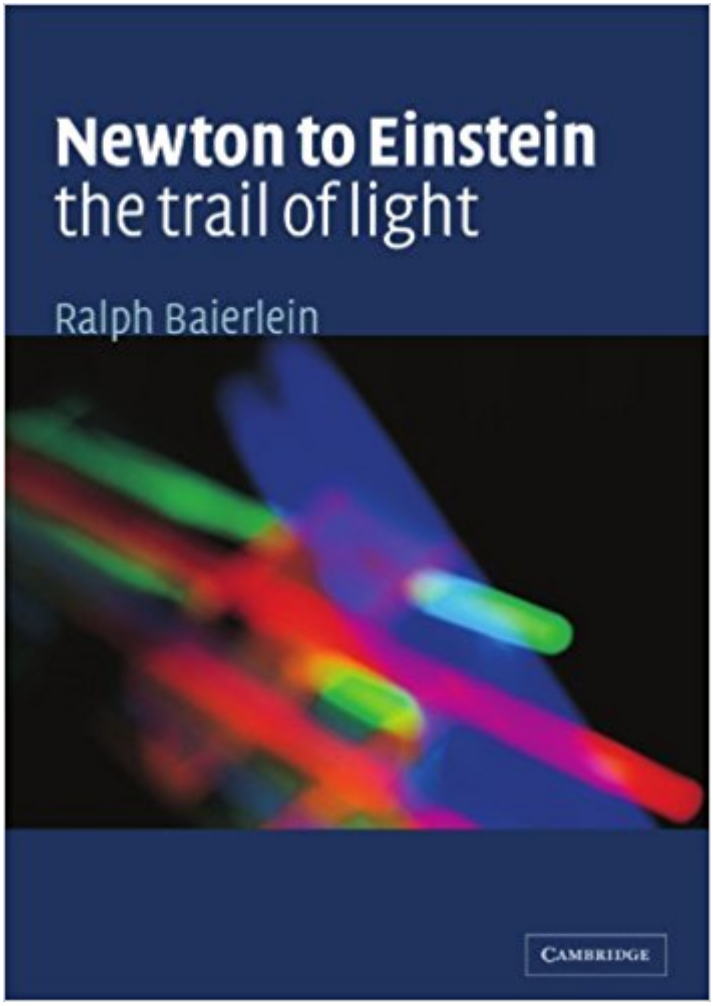
Newton To Einstein: The Trail Of Light: An Excursion To The Wave-Particle Duality And The Special Theory Of Relativity



Synopsis

This engaging text takes the reader along the trail of light from Newton's particles to Einstein's relativity. Like the best detective stories, it presents clues and encourages the reader to draw conclusions before the answers are revealed. The first seven chapters cover the behavior of light, Newton's particle theory, waves and an electromagnetic wave theory of light, the photon, and wave-particle duality. Baierlein goes on to develop the special theory of relativity, showing how time dilation and length contraction are consequences of the two simple principles underlying the theory. An extensive chapter derives the equation E = mc2 clearly from first principles and then explores its consequences.

Book Information

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Customer Reviews

' ... I find Baierlein's approach highly congenial. Indeed I expect that some of the fascinating stories I learned from him and, more importantly, some of the excellent tricks he has taught me (particularly several neat and simple gedanken experiments that lead to relativistic momentum) will make my own course very much better. I can offer no higher praise. N. David Mermin, American Journal of Physics'The exposition is absolutely sound and lucid. The discussion is never allowed to get too abstract, being filled with fine descriptions of modern experimental demonstrations of the fundamental relativistic effects. I could quite happily teach a course from this book, and I can recommend it warmly.' American Journal of Physics'The book has many excellent features ... includes some recent and quite interesting experiments not found in other textbooks ... This is a fine textbook that should give students a real 'feel' for what physics is and how it progresses ... It also

makes these topics, which are inherently difficult, as easy as possible for students to grasp.’ Joseph F. Mulligan, JCST’Although written for classroom use, an excellent introduction to some of the important ideas of modern physics that should be both interesting and accessible to the proverbial intelligent general reader ... Highly recommended for all college and university libraries.’ K. L. Schick, Choice’... a pleasure ... it is a must for every library.’ Peter Borcherds, European Journal of Physics’This undergraduate text is an excellent introduction to some of the important ideas of modern physics that should be both interesting and accessible also to the general reader.’ GLASS Science and Technology

This undergraduate text takes the reader along the trail of light from Newton’s particles to Einstein’s relativity. Like the best detective stories, it presents clues and encourages the reader to draw conclusions before the answers are revealed. The first seven chapters describe how light behaves, develop Newton’s particle theory, introduce waves and an electromagnetic wave theory of light, discover the photon, and culminate in the wave-particle duality. The book grew out of a popular one-semester course for non-science students.

Dr. Baierlein quotes Sigurd Olson on the opening page of the second or third chapter so he started on my good side right there.My complaint is that while Dr. Baierlein goes through great pains to explain, verbally, the mathematical formulas that describe light, he is remarkably stingy with numbers. For example, in Chapter 6, as he is describing the absorption of light and the resulting ejection of electrons from a metallic surface I keep wishing he would throw in some numerical examples rather than just describing how the formula works.He describes "the maximum energy of an electron after it is ejected" and I keep thinking, "DUDE!, would it KILL YOU to give a numerical example?" 100 joules? .00001 joules? 10^-49 joules? He could have just added a sentence saying "The material constant for [for example] zinc is "b" so the maximum energy of an electron ejected from zinc would be "Y" Joules if the surface is illuminated by light with the frequency of "f"".

Fun book if you can keep with it and most everyone should. Not technical or mathemetically challenging! Enjoyed the stories and asides... my son says I’m just like the author. Get to the point. This is a story book (not surprising given the title) although it’s being used as a text book for a summer course with no other notes for guidance. Sometimes the questions at the end of the chapters are very simple but some are difficult to answer because the answers aren’t sitting out in the open waiting for you to snap them up. You gotta be thinking. Wish there were answers in the

back. Would have been fun companion reading in th day when I was taking this [...]

This book is clear and very interesting. It teaches the general idea of light and modern physics. It can be too simplistic at times for technically minded people.

Newton to Einstein: The Trail of Light: An Excursion to the Wave-Particle Duality and the Special Theory of Relativity 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 Einstein Already had it, But He Did not See it: Part 0: The Discarded Term from the Einstein-Hilbert-Action (Einstein had it Book 1) From Special Relativity to Feynman Diagrams: A Course in Theoretical Particle Physics for Beginners (UNITEXT for Physics) Helmut Newton: SUMO, Revised by June Newton The Story of Science: Newton at the Center: Newton at the Center Albert Einstein and the Theory of Relativity (Solutions Series) Electromagnetic Wave Propagation, Radiation, and Scattering: From Fundamentals to Applications (IEEE Press Series on Electromagnetic Wave Theory) Mastering Elliott Wave: Presenting the Neely Method: The First Scientific, Objective Approach to Market Forecasting with the Elliott Wave Theory (version 2) Finite Element Methods for Particle Transport: Applications to Reactor and Radiation Physics (Research Studies in Particle and Nuclear Technology) Great Minds: Isaac Newton, Nikola Tesla, and Albert Einstein, Founders of the Scientific Age How to Attain Enlightenment: The Vision of Non-Duality Albert Einstein and Relativity for Kids: His Life and Ideas with 21 Activities and Thought Experiments (For Kids series) The Hunt for Vulcan: Ã¢â ¬Â¦And How Albert Einstein Destroyed a Planet, Discovered Relativity, and Deciphered the Universe 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) Six Not-So-Easy Pieces: Einstein's Relativity, Symmetry, and Space-Time God's Equation: Einstein, Relativity, and the Expanding Universe What Is Relativity?: An Intuitive Introduction to Einstein's Ideas, and Why They Matter Six Not-So-Easy Pieces: Einstein’s Relativity, Symmetry, and Space-Time