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Einstein 1905
Introduction to Special Relativity
Relativity
Introduction to the Theory of Relativity

RIVAS ELLE

From Einstein to Strings Princeton University Press
The book presents the theory of relativity as a unified whole. By showing that the concepts of this theory are interrelated to form a unified totality David Bohm supplements some of the more specialist courses which have tended to give students a fragmentary impression of the logical and conceptual nature of physics as a whole.
Einstein's 1912 Manuscript on the Special Theory of Relativity Sheba Blake Publishing
Writing a new book on the classic subject of Special Relativity, on which numerous important physicists have contributed and many books have already been written, can be like adding another epicycle to the Ptolemaic cosmology. Furthermore, it is our belief that if a book has no new elements, but simply repeats what is written in the existing literature, perhaps with a different style, then this is not enough to justify its publication. However, after having spent a number of years, both in class and research with relativity, I have come to the conclusion that there exists a place for a new book. Since it appears that somewhere along the way, mathem- ics may have obscured and prevailed to the degree that we tend to teach relativity (and I believe, theoretical physics) simply using “heavier” mathematics without the inspiration and the mastery of the classic physicists of the last century. Moreover current trends encourage the application of techniques in producing quick results and not tedious conceptual approaches resulting in long-lasting reasoning. On the other hand, physics

cannot be done a´ la carte stripped from philosophy, or, to put it in a simple but dramatic context A building is not an accumulation of stones! As a result of the above, a major aim in the writing of this book has been the distinction between the mathematics of Minkowski space and the physics of r- ativity.
The Special Theory of Relativity Diamond Pocket Books Pvt Ltd
By the year 1900, most of physics seemed to be encompassed in the two great theories of Newtonian mechanics and Maxwell's theory of electromagnetism. Unfortunately, there were inconsistencies between the two theories that seemed irreconcilable. Although many physicists struggled with the problem, it took the genius of Einstein to see that the inconsistencies were concerned not merely with mechanics and electromagnetism, but with our most elementary ideas of space and time. In the special theory of relativity, Einstein resolved these difficulties and profoundly altered our conception of the physical universe. Readers looking for a concise, well-written explanation of one of the most important theories in modern physics need search no further than this lucid undergraduate-level text. Replete with examples that make it especially suitable for self-study, the book assumes only a knowledge of algebra. Topics include classical relativity and the relativity postulate, time dilation, the twin paradox, momentum and energy, particles of zero mass, electric and magnetic fields and forces, and more.
Meson Theory Of Nuclear Forces Courier Corporation
For Einstein, 1905 was a remarkable year. It was also a miraculous year for the history and future of science. In six short months, he published five papers that would transform our understanding of nature. This unparalleled period is the subject of Rigden's book, which deftly explains what distinguishes 1905 from all other years in the annals of science, and elevates Einstein above all other scientists of the twentieth century.
From Newton to Einstein Academic Press
This book provides a thorough introduction to Einstein's special theory of relativity, suitable for anyone with a minimum of one year's university physics with calculus. It is divided into fundamental and advanced topics. The first section starts by recalling the Pythagorean rule and its relation to the geometry of space, then covers every aspect of special relativity, including the history. The second section covers the impact of relativity in quantum theory, with an introduction to relativistic quantum mechanics and quantum field theory. It also goes over the group theory of the Lorentz group, a simple introduction to supersymmetry, and ends with cutting-edge topics such as general relativity, the standard model of elementary particles and its extensions, superstring theory, and a survey of important unsolved problems. Each chapter comes with a set of exercises. The book is accompanied by a CD-ROM illustrating, through interactive animation, classic problems in relativity involving motion.
A New Approach to Einstein Mercury Learning and Information
Black holes may obliterate most things that come near them, but they saved the theory of general relativity. Einstein's theory was quickly accepted as the true theory of gravity after its publication in 1915, but soon took a back seat in physics to quantum mechanics and languished for decades on the blackboards of mathematicians. Not until the existence of black holes by Stephen Hawking and Roger Penrose in the 1960s, after

Einstein's death, was the theory revived. Almost one hundred years after general relativity replaced Newton's theory of gravitation, The Curious History of Relativity tells the story of both events surrounding general relativity and the techniques employed by Einstein and the relativists to construct, develop, and understand his almost impenetrable theory. Jean Eisenstaedt, one of the world's leading experts on the subject, also discusses the theory's place in the evolution of twentieth-century physics. He describes the main stages in the development of general relativity: its beginnings, its strange crossing of the desert during Einstein's lifetime while under heated criticism, and its new life from the 1960s on, when it became vital to the understanding of black holes and the observation of exotic objects, and, eventually, to the discovery of the accelerating universe. We witness Einstein's construction of his theory, as well as the work of his fascinated, discouraged, and enthusiastic colleagues--physicists, mathematicians, and astronomers. Written with flair, The Curious History of Relativity poses--and answers--the difficult questions raised by Einstein's magnificent intellectual feat.

The Principle of Relativity Morgan & Claypool Publishers

This book introduces the general theory of relativity and includes applications to cosmology. The book provides a thorough introduction to tensor calculus and curved manifolds. After the necessary mathematical tools are introduced, the authors offer a thorough presentation of the theory of relativity. Also included are some advanced topics not previously covered by textbooks, including Kaluza-Klein theory, Israel's formalism and branes. Anisotropic cosmological models are also included. The book contains a large number of new exercises and examples, each with separate headings. The reader will benefit from an updated introduction to general relativity including the most recent developments in cosmology.

Space and Time in Special Relativity Harvard University Press

An astrophysicist offers an entertaining introduction to Einstein's theories, explaining how well they have held up to rigorous testing over the years, and even describing the amazing phenomena readers would actually experience if they took a trip through a black hole.

Special Relativity, Electrodynamics, and General Relativity Columbia University Press

This book discusses in detail the special theory of relativity without including all the instruments of theoretical physics, enabling readers who are not budding theoretical physicists to develop competence in the field. An arbitrary but fixed inertial system is chosen, where the known velocity of light is measured. With respect to this system a moving clock loses time and a moving length contracts. The book then presents a definition of simultaneity for the other inertial frames without using the velocity of light. To do so it employs the known reciprocity principle, which in this context serves to provide a definition of simultaneity in the other inertial frames. As a consequence, the Lorentz transformation is deduced and the universal constancy of light is established. With the help of a lattice model of the special theory of relativity the book provides a deeper understanding of the relativistic effects. Further, it discusses the key STR experiments and formulates and solves 54 problems in detail.

Special Relativity Cambridge University Press

This radically reoriented and popular presentation of Einstein's Special Theory of Relativity derives its concepts from Newtonian ideas rather than by opposing them. It demonstrates that time is relative rather than absolute, that high speeds affect the nature of time, and that acceleration affects speed, time, and mass. Very little mathematics is required, and 60 illustrations augment the text.

Special Relativity Cambridge Scholars Publishing

This comprehensive textbook on relativity integrates Newtonian physics, special relativity and general relativity into a single book that emphasizes the deep underlying principles common to them all, yet explains how they are applied in different ways in these three contexts. Newton's ideas about how to represent space and time, his laws of dynamics, and his theory of gravitation established the conceptual foundation from which modern physics developed. Book I in this volume offers undergraduates a modern view of Newtonian theory, emphasizing those aspects needed for understanding quantum and relativistic contemporary physics. In 1905, Albert Einstein proposed a novel representation of space and time, special relativity. Book II presents relativistic dynamics in inertial and accelerated frames, as well as a detailed overview of Maxwell's theory of electromagnetism. This provides undergraduate and graduate students with the background necessary for studying particle and accelerator physics, astrophysics and Einstein's theory of general relativity. In 1915, Einstein proposed a new theory of gravitation, general relativity. Book III in this volume develops the geometrical framework in which Einstein's equations are formulated, and presents several key applications: black holes, gravitational radiation, and cosmology, which will prepare graduate students to carry out research in relativistic astrophysics, gravitational wave astronomy, and cosmology.

Special Relativity and Classical Field Theory Courier Corporation

The Einstein Theory of Relativity usually encompasses two interrelated theories by Albert Einstein: special relativity and general relativity. Special relativity applies to elementary particles and their interactions, describing all their physical phenomena except gravity. General relativity explains the law of gravitation and its relation to other forces of nature. It applies to the cosmological and astrophysical realm, including astronomy. The theory transformed theoretical physics and astronomy during the 20th century, superseding a 200-year-old theory of mechanics created primarily by Isaac Newton. It introduced concepts including spacetime as a unified entity of space and time, relativity of simultaneity, kinematic and gravitational time dilation, and length contraction. In the field of physics, relativity improved the science of elementary particles and their fundamental interactions, along with ushering in the nuclear age. With relativity, cosmology and astrophysics predicted extraordinary astronomical phenomena such as neutron stars, black holes, and gravitational waves.

How Einstein's Theory of Gravity Was Lost and Found Again Courier Corporation

This excellent textbook offers a unique take on relativity theory, setting it in its historical context. Ideal for those interested in relativity and the history of physics, the book contains a complete account of special relativity that begins with the historical

analysis of the reasons that led to a change in our view of space and time. Its aim is to foster a deep understanding of relativistic spacetime and its consequences for Dynamics.

Einstein's World in New Axiomatics Princeton University Press

This book pieces together the jigsaw puzzle of Einstein's journey to discovering the special theory of relativity. Between 1902 and 1905, Einstein sat in the Patent Office and may have made calculations on old pieces of paper that were once patent drafts. One can imagine Einstein trying to hide from his boss, writing notes on small sheets of paper, and, according to reports, seeing to it that the small sheets of paper on which he was writing would vanish into his desk-drawer as soon as he heard footsteps approaching his door. He probably discarded many pieces of papers and calculations and flung them in the waste paper basket in the Patent Office. The end result was that Einstein published nothing regarding the special theory of relativity prior to 1905. For many years before 1905, he had been intensely concerned with the topic; in fact, he was busily working on the problem for seven or eight years prior to 1905. Unfortunately, there are no surviving notebooks and manuscripts, no notes and papers or other primary sources from this critical period to provide any information about the crucial steps that led Einstein to his great discovery. In May 1905, Henri Poincaré sent three letters to Hendrik Lorentz at the same time that Einstein wrote his famous May 1905 letter to Conrad Habicht, promising him four works, of which the fourth one, Relativity, was a rough draft at that point. In the May 1905 letters to Lorentz, Poincaré presented the basic equations of his 1905 "Dynamics of the Electron", meaning that, at this point, Poincaré and Einstein both had drafts of papers relating to the principle of relativity. The book discusses Einstein's and Poincaré's creativity and the process by which their ideas developed. The book also explores the misunderstandings and paradoxes apparent in the theory of relativity, and unravels the subtleties and creativity of Einstein.

From Newton to Einstein Courier Dover Publications

Here are the 11 papers that forged the general and special theories of relativity: seven papers by Einstein, plus two papers by Lorentz and one each by Minkowski and Weyl. "A thrill to read again the original papers by these giants." — School Science and Mathematics. 1923 edition.

Special Relativity Createspace Independent Publishing Platform

From Newton to Einstein is a book devoted to classical mechanics. "Classical" here includes the theory of special relativity as well because, as argued in the book, it is essentially Newtonian mechanics extended to very high speeds. This information is expanded from the author's popular Q&A website, a site aimed primarily at general readers who are curious about how physics explains the workings of the world. Hence, the answers emphasize concepts over formalism, and the mathematics is kept to a minimum. Students new to physics will find discussion and quantitative calculations for areas often neglected in introductory courses (e.g. air drag and non-inertial frames). The author gives us a more intuitive approach to special relativity than normally taught in introductory courses. One chapter discusses general relativity in a completely non-mathematical way emphasizing the equivalence principle and the generalized principle of relativity; the examples in this chapter

can offer a new slant on applications of classical mechanics. Another chapter is devoted to the physics of computer games, sci-fi, superheros, and super weapons for those interested in the intersection of popular culture and science. Professional scientists will find topics that they may find amusing and, in some cases, everyday applications that they had not thought of. Brief tutorials are given for essential concepts (e.g. Newton's laws) and appendices give technical details for the interested reader.

An Illustrated Guide Oxford University Press

An analysis of one of the three great papers Einstein published in 1905, each of which was to alter forever the field it dealt with. The second of these papers, "On the Electrodynamics of Moving Bodies", established what Einstein sometimes referred to as the "so-called Theory of Relativity". Miller uses the paper to provide a window on the intense intellectual struggles of physicists in the first decade of the 20th century: the interplay between physical theory and empirical data; the fiercely held notions that could not be articulated clearly or verified experimentally; the great intellectual investment in existing theories, data, and interpretations - and associated intellectual inertia - and the drive to the long-sought-for unification of the sciences. Since its original publication, this book has become a standard reference and sourcebook for the history and philosophy of science; however, it can equally well serve as a text on twentieth-century philosophy.

Relativity and Common Sense World Scientific

This thorough introduction to Einstein's special theory of relativity is suitable for anyone with a minimum of one year of undergraduate physics with calculus. The authors cover every aspect of special relativity, including the impact of special relativity in quantum theory, with an introduction to relativistic quantum mechanics and quantum field theory. They also discuss the group theory of the Lorentz group, supersymmetry, and such cutting-edge topics as general relativity, the standard model of elementary particles and its extensions, and superstring theory, giving a survey of important unsolved problems. The book is accompanied by an interactive CD-ROM illustrating classic problems in relativity involving motion.

The Special and General Theory Morgan & Claypool Publishers

Provides the foundations of our understanding of space and time. This book gives a self-contained and modern introduction to the subject, and covers several experimental developments.

Relativity - the Special and General Theory/ Sidelights on Relativity Oxford University Press, USA

This book aims to introduce to the reader the main thread of development from Newton's laws to Einstein's theory of relativity. Limited by its scope and avoiding as much as possible the use of mathematical apparatus, the authors try to clarify the most fundamental ideas and concepts. Both authors hold a deep reverence for Galileo and Einstein, and this book is dedicated to these two great scientists.