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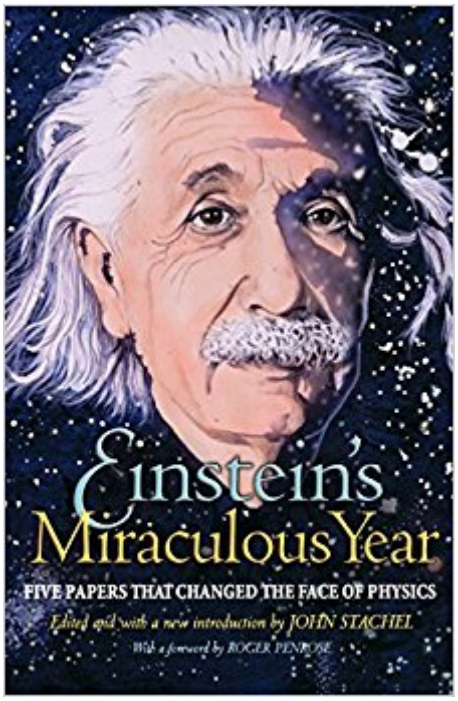
Einstein's Miraculous Year: Five Papers That Changed The Face Of Physics



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Synopsis

After 1905, Einstein’s miraculous year, physics would never be the same again. In those twelve months, Einstein shattered many cherished scientific beliefs with five extraordinary papers that would establish him as the world’s leading physicist. This book brings those papers together in an accessible format. The best-known papers are the two that founded special relativity: On the Electrodynamics of Moving Bodies and Does the Inertia of a Body Depend on Its Energy Content? In the former, Einstein showed that absolute time had to be replaced by a new absolute: the speed of light. In the second, he asserted the equivalence of mass and energy, which would lead to the famous formula E = mc2.The book also includes On a Heuristic Point of View Concerning the Production and Transformation of Light, in which Einstein challenged the wave theory of light, suggesting that light could also be regarded as a collection of particles. This helped to open the door to a whole new world--that of quantum physics. For ideas in this paper, he won the Nobel Prize in 1921.The fourth paper also led to a Nobel Prize, although for another scientist, Jean Perrin. On the Movement of Small Particles Suspended in Stationary Liquids Required by the Molecular-Kinetic Theory of Heat concerns the Brownian motion of such particles. With profound insight, Einstein blended ideas from kinetic theory and classical hydrodynamics to derive an equation for the mean free path of such particles as a function of the time, which Perrin confirmed experimentally. The fifth paper, A New Determination of Molecular Dimensions, was Einstein’s doctoral dissertation, and remains among his most cited articles. It shows how to calculate Avogadro’s number and the size of molecules.These papers, presented in a modern English translation, are essential reading for any physicist, mathematician, or astrophysicist. Far more than just a collection of scientific articles, this book presents work that is among the high points of human achievement and marks a watershed in the history of science. Coinciding with the 100th anniversary of the miraculous year, this new paperback edition includes an introduction by John Stachel, which focuses on the personal aspects of Einstein’s youth that facilitated and led up to the miraculous year.

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Customer Reviews

This book is a compilation of five important papers including Albert Einstein's dissertation, all published in Annalen der Physik the year 1905. The papers are;(1) "A new determination of molecular dimensions". Which is Einstein's dissertation.(2) On the motion of Small particles Suspended in Liquids at Rest Required by the Molecular-Kinetic Theory of Heat. This is what is referred to as Brownian Motion.(3) On the Electrodynamics of Moving Bodies. This is what is referred to as the special theory of relativity. This paper is to some degree a synthesis of work done by H.A. Lorentz and Henri Poincare, which is common in science (and Lorentz is given his fair due).(4) Does the Inertia of a Body Depend on Its Energy Content? This is essentially E = mcÃ Â and is an extension of the aforementioned paper.(5) On a heuristic Point of View Concerning the Production and Transformation of Light. This is his paper on the photo electric effect and the quantum hypothesis. This is what Einstein got his Nobel price for. However, both (2) and (3) above are often considered to be Nobel Prize work.The way I see it, these papers are of great historical value and it is awesome to be able to read the originals. However, I do not recommend this book as a good introduction to any of this material. As an engineering physics student I encountered most of the content of these papers in a more complete and clearer format. For example, the special theory of relativity is explained better in many text books on physics. Remember these papers are research papers not educational texts. That does not mean that I endorse the many non-mathematical popularizations of the topic that often end up misleading the reader.

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