Introduction To Electrodynamics

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Electrodynamics and Classical Theory of Fields and Particles Oxford University Press, USA
This book is devoted to the fundamentals of classical electrodynamics, one of the most beautiful and productive theories in physics. A general survey on the applicability of physical theories shows that only few theories can be compared to electrodynamics. Essentially, all electric and electronic devices used around the world are based on the theory of electromagnetism. It was Maxwell who created, for the first time, a unified description of the electric and magnetic phenomena in his electromagnetic field theory. Remarkably, Maxwell’s theory contained in itself also the relativistic invariance of the special relativity, a fact which was discovered only a few decades later. The present book is an outcome of the authors’ teaching experience over many years in different countries and for different students studying diverse fields of physics. The book is intended for students at the level of undergraduate and graduate studies in physics, astronomy, engineering, applied mathematics and for researchers working in related subjects. We hope that the reader will not only acquire knowledge, but will also grasp the beauty of theoretical physics. A set of about 130 solved and proposed problems shall help to attain this aim.
No-Nonsense Electrodynamics Cambridge University Press
The 1988 Nobel Prize winner establishes the subject's mathematical background, reviews the principles of electrostatics, then introduces Einstein's special theory of relativity and applies it to topics throughout the book.
An Introduction to Electrodynamics Elsevier
An engaging writing style and a strong focus on the physics make this graduate-level textbook a must-have for electromagnetism students.
Modern Electrodynamics Addison-Wesley Professional
A revision of the defining book covering the physics and classical mathematics necessary to understand electromagnetic fields in materials and at surfaces and interfaces. The third edition has been revised to address the changes in emphasis and applications that have occurred in the past twenty years.
Introduction to Electrodynamics Springer Science & Business Media
For junior/senior-level electricity and magnetism courses. This book is known for its clear, concise, and accessible coverage of standard topics in a logical and pedagogically sound order. The highly polished Fourth Edition features a clear, easy-to-understand treatment of the fundamentals of electromagnetic theory, providing a sound platform for the exploration of related applications (AC circuits, antennas, transmission lines, plasmas, optics, etc.). Its lean and focused approach employs numerous new examples and problems.
Introduction to Electrodynamics Cambridge University Press
Gauss's law for electric fields, Gauss's law for magnetic fields, Faraday's law, and the Ampere–Maxwell law are four of the most influential equations in science. In this guide for students, each equation is the subject of an entire chapter, with detailed, plain-language explanations of the physical meaning of each symbol in the equation, for both the integral and differential forms. The final chapter shows how Maxwell's equations may be combined to produce the wave equation, the basis for the electromagnetic theory of light. This book is a wonderful resource for undergraduate and graduate courses in electromagnetism and electromagnetics. A website hosted by the author at www.cambridge.org/9780521701471 contains interactive solutions to every problem in the text as well as audio podcasts to walk students through each chapter.
A Student's Guide to Maxwell's Equations Cambridge University Press
This book summarizes the basics of electricity and magnetism prior to covariant formulation of Maxwell's equations. The book works out the basics of special relativity and then applies the covariant formalism to understand radiation, both in vacuum and in material medium. The emphasis is on cleaner mathematical formalism based on experimental facts. The book contains many problems/exercises which will help the students to understand the basics of the subject. The difference between the present book with existing books of this level lies in the presentation of the topics and the subjects chosen. Instead of presenting a lot of material related to electromagnetism, it presents some very important but selected problems of advanced electromagnetism to students who are learning it for the first time. This book is aimed at graduate/advanced graduate students who have done at least one basic level course in electricity and magnetism.
Electricity and Magnetism John Wiley & Sons
Learning Electrodynamics doesn’t have to be boring What if there was a way to learn Electrodynamics without all the usual fluff? What if there were a book that allowed you to see the whole picture and not just tiny parts of it? Thoughts like this are the reason that No-Nonsense Electrodynamics now exists. What will you learn from this book? Get to know all fundamental electrodynamical concepts —Grasp why we can describe electromagnetism using the electric and magnetic field, the electromagnetic field tensor and the electromagnetic potential and how these concepts are connected.Learn to describe Electrodynamics mathematically — Understand the meaning and origin of the most important equations: Maxwell’s equations & the Lorentz force law.Master the most important electrodynamical systems — read step-by-step calculations and understand the general algorithm we use to describe them.Get an understanding you can be proud of — Learn why Special Relativity owes its origins to Electrodynamics and how we can understand it as a gauge theory. No-Nonsense Electrodynamics is the most student-friendly book on Electrodynamics ever written. Here’s why. First of all, it's is nothing like a formal university lecture. Instead, it’s like a casual conservation with a more experienced student. This also means that nothing is assumed to be “obvious” or “easy to see”.Each chapter, each section, and each page focusses solely on the goal to help you understand. Nothing is introduced without a thorough motivation and it is always clear where each formula comes from.The book contains no fluff since unnecessary content quickly leads to confusion. Instead, it ruthlessly focusses on the fundamentals and makes sure you’ll understand them in detail. The primary focus on the readers’ needs is also visible in dozens of small features that you won’t find in any other textbook In total, the book contains more than 100 illustrations that help you understand the most important concepts visually. In each chapter, you’ll find fully annotated equations and calculations are done carefully step-by-step. This makes it much easier to understand what’s going on in.Whenever a concept is used which was already introduced previously, there is a short sidenote that reminds you where it was first introduced and often recites the main points. In addition, there are summaries at the beginning of each chapter that make sure you won’t get lost.
Introduction to Electrodynamics: Pearson New International Edition Alpha Science Int'l Ltd.
For 50 years, Edward M. Purcell's classic textbook has introduced students to the world of electricity and magnetism. The third edition has been brought up to date and is now in SI units. It features hundreds of new examples, problems, and figures, and contains discussions of real-life applications. The textbook covers all the standard introductory topics, such as electrostatics, magnetism, circuits, electromagnetic waves, and electric and magnetic fields in matter. Taking a nontraditional approach, magnetism is derived as a relativistic effect. Mathematical concepts are introduced in parallel with the physics topics at hand, making the motivations clear. Macroscopic phenomena are derived rigorously from the underlying microscopic physics. With worked examples, hundreds of illustrations, and nearly 600 end-of-chapter problems and exercises, this textbook is ideal for electricity and magnetism courses. Solutions to the exercises are available for instructors at www.cambridge.org/Purcell-Morin.
An Introduction to Electrodynamics Springer Nature
In spite of the impressive predictive power and strong

mathematical structure of quantum mechanics, the theory has always suffered from important conceptual problems. Some of these have never been solved. Motivated by this state of affairs, a number of physicists have worked together for over thirty years to develop stochastic electrodynamics, a physical theory aimed at finding a conceptually satisfactory, realistic explanation of quantum phenomena. This is the first book to present a comprehensive review of stochastic electrodynamics, from its origins to present-day developments. After a general introduction for the non-specialist, a critical discussion is presented of the main results of the theory as well as of the major problems encountered. A chapter on stochastic optics and some interesting consequences for local realism and the Bell inequalities is included. In the final chapters the authors propose and develop a new version of the theory that brings it in closer correspondence with quantum mechanics and sheds some light on the wave aspects of matter and the linkage with quantum electrodynamics. Audience: The volume will be of interest to scholars and postgraduate students of theoretical and mathematical physics, foundations and philosophy of physics, and teachers of theoretical physics and quantum mechanics, electromagnetic theory, and statistical physics (stochastic processes).

Weber's Electrodynamics Pearson Higher Ed

Comprehensive graduate-level text by a distinguished theoretical physicist reveals the classical underpinnings of modern quantum field theory. Topics include space-time, Lorentz transformations, conservation laws, equations of motion, Green's functions, and more. 1964 edition.

Mathematical Introduction to Electrodynamics Cambridge University Press

1. Classical foundations -- 2. Special relativity -- 3. Quantum mechanics -- 4. Elementary particles -- 5. Cosmology.

Introduction to Quantum Mechanics Prentice Hall

Introduction to Electrodynamics and Radiation introduces the reader to electrodynamics and radiation, with emphasis on the microscopic theory of electricity and magnetism. Nonrelativistic quantum electrodynamics (QED) is presented as a logical outgrowth of the classical theory, both relativistic and nonrelativistic. The advanced mathematical and diagrammatic techniques of the relativistic quantum field theory are also described in a simple and easily understood manner. Comprised of 16 chapters, this book opens with an overview of the special theory of relativity and some of its consequences. The following chapters deal with classical relativistic electrodynamics, touching on topics such as tensor analysis and Riemannian spaces; radiation from charged particles; radiation scattering from electrons; and the classical theory of charged particles. The second part of the book is entirely quantum mechanical in outlook, beginning with the quantization of the Hamiltonian formulation of classical electrodynamics. The many-body formalism leading to Fock-space techniques is also considered, along with self-energies and renormalization. The final chapter is devoted to the covariant formulation of QED as well as the validity of QED. This monograph is written primarily for graduate students in elementary classical and quantum mechanics, electricity and magnetism, and modern physics courses.

Introduction to Electrodynamics World Scientific

This book is an excellent text for undergraduates majoring in physics and engineering. The style pedagogical with clear and concise illustration followed by practise problems at the end of each chapter.

Electrodynamics: A Concise Introduction Springer Science & Business Media

For junior/senior-level electricity and magnetism courses. This book is known for its clear, concise and accessible coverage of standard topics in a logical and pedagogically sound order. The Third Edition features a clear, accessible treatment of the fundamentals of electromagnetic theory, providing a sound platform for the exploration of related applications (ac circuits, antennas, transmission lines, plasmas, optics, etc.). Its lean and focused approach employs numerous examples and problems.

No-Nonsense Electrodynamics Cambridge University Press

"An Introduction to Electrodynamics provides an excellent foundation for those undertaking a course on electrodynamics, providing an in-depth yet accessible treatment of topics covered in most undergraduate courses, but goes one step further to introduce advanced topics in applied physics, such as fusions plasmas, stellar magnetism and planetary dynamos. Some of the central ideas behind electromagnetic waves, such as three-dimensional wave propagation and retarded potentials, are first explored in the introductory background chapters and explained in the much simpler context of acoustic waves. The inclusion of two chapters on magnetohydrodynamics provides the opportunity to illustrate the basic theory of electromagnetism with a wide variety of physical applications of current interest. Davidson places great emphasis on the pedagogical development of ideas throughout the text, and includes many detailed illustrations and well-chosen exercises to complement the material and encourage student development."--Back cover.

An Introduction to Electrodynamics from the Standpoint of the Electron Theory Springer Science & Business Media

This book consists of two parts. Part A (Chapters 1-3) is an introduction to the physics of conducting solids, while Part B (Chapters 4-10) is an introduction to the theory of electromagnetic fields and waves. The book is intended to introduce the student to classical electrodynamics and, at the same time, to explain in simple terms the quantum theory of conducting substances – in particular, the solid ones. Excessive mathematical proof is avoided as much as possible, in favor of pedagogical efficiency at an introductory level. The theory of vector fields is briefly discussed in a separate chapter, helping the student cope with the mathematical challenges of Maxwell's theory. The book serves as a primary source for a sophomore-level electromagnetics course in an electronics-oriented engineering program, but it can also be used as a secondary (tutorial) source for an intermediate-level course in electrodynamics for physicists and engineers. The content is based on the author's lecture notes for his sophomore-level Physics course at the Hellenic Naval Academy.

Introduction to Electrodynamics Courier Corporation

For junior/senior-level electricity and magnetism courses. This book is known for its clear, concise, and accessible coverage of standard topics in a logical and pedagogically sound order. The highly polished Fourth Edition features a clear, easy-to-understand treatment of the fundamentals of electromagnetic theory, providing a sound platform for the exploration of related applications (AC circuits, antennas, transmission lines, plasmas, optics, etc.). Its lean and focused approach employs numerous new examples and problems.

An Introduction to Electrodynamics Cambridge University Press

This is a re-issued and affordable printing of the widely used undergraduate electrodynamics textbook.

Introduction to Electrodynamics and Radiation Independently Published

A comprehensive, modern introduction to electromagnetism This graduate-level physics textbook provides a comprehensive treatment of the basic principles and phenomena of classical electromagnetism. While many electromagnetism texts use the subject to teach mathematical methods of physics, here the emphasis is on the physical ideas themselves. Anupam Garg distinguishes between electromagnetism in vacuum and that in material media, stressing that the core physical questions are different for each. In vacuum, the focus is on the fundamental content of electromagnetic laws, symmetries, conservation laws, and the implications for phenomena such as radiation and light. In material media, the focus is on understanding the response of the media to imposed fields, the attendant constitutive relations, and the phenomena encountered in different types of media such as dielectrics, ferromagnets, and conductors. The text includes applications to many topical subjects, such as magnetic levitation, plasmas, laser beams, and synchrotrons. Classical Electromagnetism in a Nutshell is ideal for a yearlong graduate course and features more than 300 problems, with solutions to many of the advanced ones. Key formulas are given in both SI and Gaussian units; the book includes a discussion of how to convert between them, making it accessible to adherents of both systems. Offers a complete treatment of classical electromagnetism Emphasizes physical ideas Separates the treatment of electromagnetism in vacuum and material media Presents key formulas in both SI and Gaussian units Covers applications to other areas of physics Includes more than 300 problems