

# Classical Electromagnetism By Jerrold Franklin

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2021-03-31

## FINLEY SWEENEY

*Emotional Choices* Courier Corporation

An Introduction to Classical Electrodynamics covers the topics of Electricity, Magnetism, and Optics at the upper-level undergraduate level in physics or electrical engineering. This book tells the story of the historical development of electrodynamics, at the same time as introducing students to electrodynamics with vector calculus. This is the best treatment of the historical development of electricity, magnetism and electrodynamics I have ever seen. The breadth of the authors' knowledge, together with their ability to summarize historical results in exceptionally clear terms, is wonderful. Developing electromagnetism historically makes many concepts easier to understand. --- By an anonymous reviewer who is a senior professor at a major college or university. Table of Contents Part I: Electricity Chapter 1 Charge Chapter 2 The Electrostatic Force Chapter 3 Electrical Potential Energy Chapter 4 Gauss's Law Chapter 5 The Equations of Laplace and Poisson PART II: Magnetism Chapter 6 Permanent Magnets Chapter 7 The Vector Potential and the Curl Chapter 8 Electromagnetism Chapter 9 Faraday's Law of Induction Chapter 10 The Electron Chapter 11 Galilean Relativity in Electrodynamics Chapter 12 Superconductors and Plasmas Part III: Light Chapter 13 Transmission Lines Chapter 14 Light in an Optical Medium Chapter 15 Light in Free Space Chapter 16 Sources of Electromagnetic Radiation Chapter 17 Special Relativity Chapter 18 The Photon [https://maricourt.press/keohane\\_foy](https://maricourt.press/keohane_foy) ISBN: 978-1-949942-00-2 728 pages, 650 illustrations, \$30 Maricourt Academic Press: Textbooks with Content and Context A good popular science book tells a story of discovery. A good academic treatise introduces new ideas with convincing evidence. A good how-to manual provides many step-by-step examples. A good textbook does all three -- and more.

*Neoclassical Realist Theory of International Politics* Springer Practically all of modern physics deals with fields—functions of space (or spacetime) that give the value of a certain quantity, such as the temperature, in terms of its location within a prescribed volume. Electrodynamics is a comprehensive study of the field produced by (and interacting with) charged particles, which in practice means almost all matter. Fulvio Melia's *Electrodynamics* offers a concise, compact, yet complete treatment of this important branch of physics. Unlike most of the standard texts, *Electrodynamics* neither assumes familiarity with basic concepts nor ends before reaching advanced theoretical principles. Instead this book takes a continuous approach, leading the reader from fundamental physical principles through to a relativistic Lagrangian formalism that overlaps with the field theoretic techniques used in other branches of advanced physics. Avoiding unnecessary technical details and calculations, *Electrodynamics* will serve both as a useful supplemental text for graduate and advanced undergraduate students and as a helpful overview for physicists who specialize in other fields.

*Problems in Classical Electromagnetism* Courier Dover Publications

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.

*The Geometry of Spacetime* Courier Dover Publications

'Taken for Wonder' focuses on 19th-century travelogues authored by Iranians in Europe and argues for a methodological shift in the way scholars interpret travel writing.

*Solved Problems in Quantum and Statistical Mechanics* Routledge

Explains the fundamental concepts of Newtonian mechanics, special relativity, waves, fluids, thermodynamics, and statistical mechanics. Provides an introduction for college-level students of physics, chemistry, and engineering, for AP Physics students, and for general readers interested in advances in the sciences. In volume II, Shankar explains essential concepts, including electromagnetism, optics, and quantum mechanics. The book begins at the simplest level, develops the basics, and reinforces fundamentals, ensuring a solid foundation in the principles and methods of physics.

*Classical Theory of Electromagnetism* Addison-Wesley Longman Newly corrected, this edition of a highly acclaimed text is suitable for advanced physics courses. Its accessible macroscopic view of classical electromagnetics emphasizes integrating electromagnetic theory with physical optics. 1994 edition.

*Classical Electromagnetic Radiation* Courier Corporation

An antidote to mathematical rigor mortis, teaching how to guess answers without needing a proof or an exact calculation. In problem solving, as in street fighting, rules are for fools: do whatever works—don't just stand there! Yet we often fear an unjustified leap even though it may land us on a correct result. Traditional mathematics teaching is largely about solving exactly stated problems exactly, yet life often hands us partly defined problems needing only moderately accurate solutions. This engaging book is an antidote to the rigor mortis brought on by too much mathematical rigor, teaching us how to guess answers without needing a proof or an exact calculation. In *Street-Fighting Mathematics*, Sanjoy Mahajan builds, sharpens, and demonstrates tools for educated guessing and down-and-dirty, opportunistic problem solving across diverse fields of knowledge—from mathematics to management. Mahajan describes six tools: dimensional analysis, easy cases, lumping, picture proofs, successive approximation, and reasoning by analogy. Illustrating each tool with numerous examples, he carefully separates the tool—the general principle—from the particular application so that the reader can most easily grasp the tool itself to use on problems of particular interest. *Street-Fighting Mathematics* grew out of a short course taught by the author at MIT for students ranging from first-year undergraduates to graduate students ready for careers in physics, mathematics, management, electrical engineering, computer science, and biology. They benefited from an approach that avoided rigor and taught them how to use mathematics to solve real problems. *Street-Fighting Mathematics* will appear in print and online under a Creative Commons Noncommercial Share Alike license.

*Taken for Wonder* University of Chicago Press

"Reading F.M. Kamm's latest book is like watching a brilliant astronomer map an uncharted galaxy--the meticulousness and the display of mental stamina must inspire awe. There is a kind of beauty in the performance alone. *Intricate Ethics* is a major event in normative ethical theory by a living master of the subject.... In the end, professional moral philosophers cannot reasonably ignore *Intricate Ethics*.... Kamm continues to prove herself the most imaginative, detail-oriented deontologist writing in English today... Professor Kamm is in a class by herself."--Jeffrey Brand-Ballard, *Notre Dame Philosophical Reviews* "The operative word in this masterful work is 'intricate.' Watching Kamm's mind dissect and reconstruct different cases is like watching a juggler, riding a unicycle, carrying on a conversation, while getting dressed. It is a glorious celebration of what moral philosophy does best, and what one of its most gifted practitioners can do to enlighten our understanding of the most pressing ethical issues of our time. But it is also a rich playground for empirically minded philosophers and psychologists who want to play with the clever class of dilemmas that Kamm has created, dilemmas that will both amuse and torture generations of people."--Marc Hauser is a Harvard College Professor and author of "Moral Minds" "Frances Kamm once again proves herself to be an astonishingly subtle and creative defender of a deontological outlook. Anyone at all interested in normative ethics will find something of value in *Intricate Ethics*. There are striking and original views on a wide range of topics. And no one--absolutely no one--compares to Kamm when it comes to constructing relevant test cases and carefully assessing our intuitive reactions to them. This is a master at work, at the height of her powers."--Shelly Kagan, Clark Professor of Philosophy, Yale University "Intricate Ethics fully justifies its title. It is as deep, subtle, imaginative, and analytically rigorous as any work in moral philosophy written in a great many years. It is dense with highly original and fertile ideas supported by powerful and ingenious arguments. This book amply confirms Frances Kamm's standing as one of the greatest living philosophers.--Jeff McMahan, Rutgers University "Kamm's virtuosity in hypothesizing cases in defense or refutation of moral principles remains unsurpassed. *Intricate Ethics* is also a testament to the fruitfulness of this rarefied method of ethics. One might have thought that, having already devoted several hundred path-breaking pages to the topic of nonconsequentialism in her earlier two-volume *Morality, Mortality*, it would have been impossible to break much new ground in this sequel. Yet what Kamm has to say here on the topics of harming and saving from harm is as novel, arresting, and insightful as ever."--Michael Otsuka, Professor of Philosophy, University College London "Kamm ...is the most sophisticated of the contemporary exponents of "intuitionist" or "nonconsequentialist" ethics...No one else makes such extraordinarily meticulous and penetrating attempts to extract the principles behind our ordinary moral intuitions...I highly recommend it as an inclusive and subtle

attempt to work out nonconsequentialism on an intuitionist basis. As a bonus, *Intricate Ethics* also offers searching analyses of the work of Peter Unger, Peter Singer, Bernard Gert, T.M. Scanlon, Daniel Kahneman and Amos Tversky."--Ingmar Persson, *Times Literary Supplement*

*Street-Fighting Mathematics* Oxford University Press, USA

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

*Principles of Electrodynamics* Oxford University Press

"Neoclassical realism is a major theoretical approach to the study of foreign policy. Norrin M. Ripsman, Jeffrey W. Taliaferro, and Steven E. Lobell argue that it can explain and predict a far broader range of political phenomena in international politics. Neoclassical realism challenges other approaches, including structural realism, liberalism, and constructivism"--

*Classical Electromagnetism* Yale University Press

The second edition of *Electromagnetism: Theory and Applications* has been updated to cover some additional aspects of theory and nearly all modern applications. The semi-historical approach is unchanged, but further historical comments have been introduced at various places in the book to give a better insight into the development of the subject as well as to make the study more interesting and palatable to the students. What is New to This Edition Vector transformations in different coordinate systems have been included in the chapter on Vector Analysis. The treatment forms the basis of vector potentials for three-dimensional problems. Chapter 13 on Vector Potentials has been significantly expanded for a clear understanding of the properties of vector potentials, in order to also solve three-dimensional EM problems numerically. A section dealing with the derivation and interpretation of Hertz Vector has been included in Chapter 13. A practical problem on induction heating of flat metal plates has been added to the chapter on Magnetic Diffusion. The topics of wave guidance and radiation have been expanded with emphasis on practical aspects. Sections on analysis of cylindrical dielectric waveguide (e.g. of optical fibres) have been added to Chapters 18 and 22. New sections on basis and explanations of modal transmissions have been added. Characteristics and practical details of basic antenna structures and arrays have been treated in greater detail. Provides comprehensive treatment of FEM (Finite Element Method), covering both its variational basis and procedural details, to enable the readers to use this method without going into the heavy mathematics underlying the method. Describes FDM (Finite Difference Method) in more detail with its convergence requirement. Introduces modern numerical methods like FDTD (Finite Difference Time Domain) and method of moments (MOM). A new chapter on Modern Topics and Applications covers both high frequency and low frequency applications. Appendices contain in-depth analysis of self-inductance and non-conservative fields (Appendix 6), proof regarding the boundary conditions (Appendix 8), theory of bicylindrical coordinate system to provide the physical basis of the circuit approach to the cylindrical transmission line systems (Appendix 10), and properties of useful functions like Bessel and Legendre functions (Appendix 9). The book is designed to serve as a core text for students of electrical engineering. Besides, it

will be useful to postgraduate physics students as well as research engineers and design and development engineers in industries.

**Understanding Vector Calculus** Classical Electromagnetism simulated motion on a computer screen, and to study the effects of changing parameters. --

*Conquering the Physics GRE* Springer

Includes all the core curriculum topics, this physics ebook for kids 12+ is the perfect support for home and school learning. Breaking down the information into easy, manageable chunks, Super Simple Physics covers everything from atoms to astronomy and forces to flotation. Each topic is fully illustrated to support the information, make the facts crystal clear, and bring the science to life. For key ideas, a "How it works" panel explains the theory with the help of bright, simple graphics. And for revision, a handy "Key facts" box provides a simple summary you can check back on later. With clear, concise coverage of all the core physics topics, Super Simple Physics is the perfect accessible e-guide to science for children that will support classwork and make studying for tests the easiest it's ever been.

**Solved Problems in Classical Mechanics** IOP Publishing Limited Companion to Classical Electromagnetism: Second Edition, which features only basic answers. This book contains some problems from the companion volume plus many new ones, all with complete, worked-out solutions. 2018 edition.

**The Business of Electronics** Springer Science & Business Media

Challenging the popular myth of a present-day 'information revolution', Media Technology and Society is essential reading for anyone interested in the social impact of technological change.

Winston argues that the development of new media forms, from the telegraph and the telephone to computers, satellite and virtual reality, is the product of a constant play-off between social necessity and suppression: the unwritten law by which new technologies are introduced into society only insofar as their disruptive potential is limited.

**Mathematics for Physicists** Oxford University Press

This concise text is a workbook for using vector calculus in practical calculations and derivations. Part One briefly develops vector calculus from the beginning; Part Two consists of answered problems. 2020 edition.

*Super Simple Physics* PHI Learning Pvt. Ltd.

This textbook introduces advanced classical electrodynamics using modern mathematical techniques, with an emphasis on physical concepts. Connections to field theory and general relativity are highlighted while the book still serves as the basis for a one- or two-semester course on electrodynamics within the graduate curriculum. Request Inspection Copy

**Classical Electromagnetism** Courier Corporation

This book contains 157 problems in classical electromagnetism, most of them new and original compared to those found in other textbooks. Each problem is presented with a title in order to

highlight its inspiration in different areas of physics or technology, so that the book is also a survey of historical discoveries and applications of classical electromagnetism. The solutions are complete and include detailed discussions, which take into account typical questions and mistakes by the students. Without unnecessary mathematical complexity, the problems and related discussions introduce the student to advanced concepts such as unipolar and homopolar motors, magnetic monopoles, radiation pressure, angular momentum of light, bulk and surface plasmons, radiation friction, as well as to tricky concepts and ostensible ambiguities or paradoxes related to the classical theory of the electromagnetic field. With this approach the book is both a teaching tool for undergraduates in physics, mathematics and electric engineering, and a reference for students wishing to work in optics, material science, electronics, plasma physics.

**Fundamentals of Physics II** World Scientific Publishing Company Electrostatics - Magnetostatic field and quasi-stationary electromagnetic fields - Circuit analysis - Electromagnetic waves - Relativity, particle-field interactions.

**Solved Problems in Classical Electromagnetism** Oxford University Press

Hermann Minkowski recast special relativity as essentially a new geometric structure for spacetime. This book looks at the ideas of both Einstein and Minkowski, and then introduces the theory of frames, surfaces and intrinsic geometry, developing the main implications of Einstein's general relativity theory.