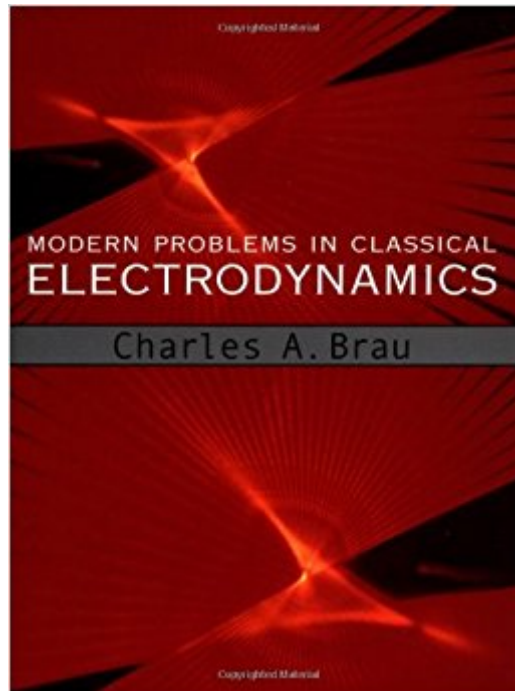




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Modern Problems In Classical Electrodynamics (Physics)



Synopsis

Designed as an upper-level undergraduate/beginning graduate text and as a reference for research scientists, *Modern Problems in Classical Electrodynamics* addresses a wide range of topics in modern physics--including lasers and nonlinear optics--that are not found in other texts. The book begins with relativistic mechanics and field theory, partly because they lend unity and beauty to electrodynamics, and also because relativistic concepts appear frequently throughout the book. Electrostatics and magnetostatics, waves, continuous media, nonlinear optics, diffraction, and radiation by moving particles are then covered in depth. The book concludes by returning to basics, discussing the fundamental problems inherent in the classical theory of electrons. *Modern Problems in Classical Electrodynamics* features examples and homework exercises drawn from condensed-matter physics, particle physics, optics, and atomic physics. Many of these are experimentally oriented and help to make the book interesting and relevant to a broad audience. An instructor's manual including answers to the homework exercises is available to adopters. An accompanying website, <http://www.physics.vanderbilt.edu/brau/book/Index.html>, contains errata and additional homework exercises that instructors can use to supplement the exercises in the text.

Book Information

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Customer Reviews

Charles A. Brau received his B.A. in Engineering from Cornell University and his M.A. (in Engineering) and Ph.D. in Applied Physics from Harvard University. In the course of his career, he has been a theorist, an experimenter, a manager, and currently a professor of physics at the

Vanderbilt University in Nashville, Tennessee. He focuses his research on free-electron lasers (FEL) and electron beams. He became a program manager of the FEL program at Los Alamos National Laboratory and then a director of the FEL Center at Vanderbilt University. In 1988 he was a visiting scientist in the Department of Nuclear Physics at the University of Oxford in England. He is an author of 7 patents and numerous publications, including 2 books. He is also a fellow of American Physical Society.

In most textbooks, including Jackson's, Maxwell's equations are derived empirically through Coulomb's law, the law of Biot and Savart, Faraday's law, and Maxwell's inclusion of displacement current. This approach has been presented again to most of physics graduate students; However, using this approach to graduate student will diminish much of the excitement and enthusiasm and ignore the entirely new way to look at from the relativistic point of view where electric and magnetic fields are really different aspects of same physical quantity. Brau's arrangement of the text, was influenced by that of Landau and Lifshitz, developed much easier version with a theoretically more elegant approach: a treatment of the electromagnetic fields which emphasizes its relativistic aspects from the beginning. Also, Charles A. Brau gathers valuable information from such classic texts as Max Born and Emil Wolf's Principles of Optics, Joseph W. Goodman's Introduction to Fourier Optics, and L. D. Landau and E. M. Lifshitz's The Classical Theory of Fields, Jackson's classical book, and packages it all into one very readable volume.

The moment the professor in our class told us that instead of Jackson we'd be using another book I couldn't hide my joyous feelings. I ordered Brau's book (the recommended for our e&m course) and waited... After living 3 months with this book all I have to say is how disappointed I feel. I thought it would be a really modern e&m book. In some aspects it is. The material it covers is pretty interesting. But the book has so many mistakes that get very frustrating. Keep in mind that at the back cover an errata webpage is referred (with several pages of corrections!). Trust me, you'll need it. Also, most of the problems are exactly the opposite of Jackson's - too easy, although I must say that I like the approach "Using A prove that B holds" - by knowing the result you can feel more confident when solving a problem. In short, I read the book only when I HAD TO - meaning when we were assigned problems from it. I was oscillating between this and Jackson... Now I wish we had used the second all the way through...

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