



Modern Problems in Classical Electrodynamics (Physics)

By Charles A. Brau

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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.

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Editorial Review

About the Author

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.

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