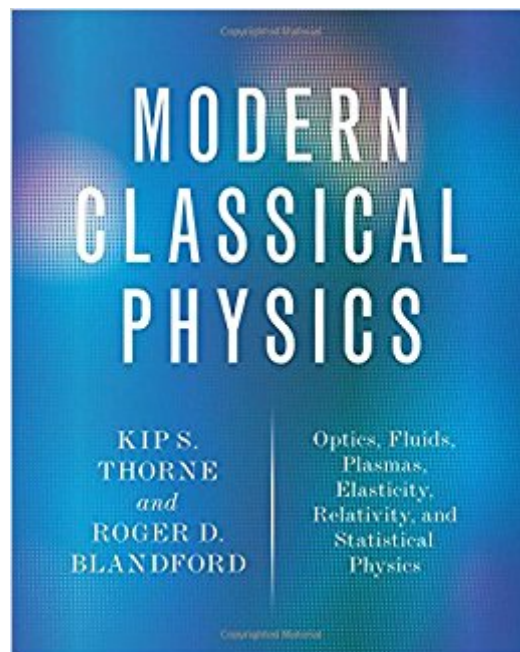




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Modern Classical Physics: Optics, Fluids, Plasmas, Elasticity, Relativity, And Statistical Physics



Synopsis

This first-year, graduate-level text and reference book covers the fundamental concepts and twenty-first-century applications of six major areas of classical physics that every masters- or PhD-level physicist should be exposed to, but often isn't: statistical physics, optics (waves of all sorts), elastodynamics, fluid mechanics, plasma physics, and special and general relativity and cosmology. Growing out of a full-year course that the eminent researchers Kip Thorne and Roger Blandford taught at Caltech for almost three decades, this book is designed to broaden the training of physicists. Its six main topical sections are also designed so they can be used in separate courses, and the book provides an invaluable reference for researchers. Presents all the major fields of classical physics except three prerequisites: classical mechanics, electromagnetism, and elementary thermodynamics. Elucidates the interconnections between diverse fields and explains their shared concepts and tools. Focuses on fundamental concepts and modern, real-world applications. Takes applications from fundamental, experimental, and applied physics; astrophysics and cosmology; geophysics, oceanography, and meteorology; biophysics and chemical physics; engineering and optical science and technology; and information science and technology. Emphasizes the quantum roots of classical physics and how to use quantum techniques to elucidate classical concepts or simplify classical calculations. Features hundreds of color figures, some five hundred exercises, extensive cross-references, and a detailed index. An online illustration package is available to professors.

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Customer Reviews

"Remarkable for its scope and authority, this text offers a new vision of the 'theoretical minimum' of classical physics that all physicists should know, a vision that I hope will revitalize the curricula of many physics departments. On my own shelf it will replace half a dozen dog-eared reference texts."--Scott Tremaine, Institute for Advanced Study

"In an era of fragmentation and specialization, Thorne and Blandford have given us an audacious and splendid grand unification of classical physics, using geometry and space-time as synthesizing principles. Complicated fields as diverse as optics, elasticity, and plasma physics fall to their masterful pedagogy."--William H. Press, University of Texas at Austin

"Comprehensive, concise, and coherent, this is a marvelous summary of the essence of classical physics, somewhat reminiscent of the classic texts of Landau and Lifshitz, and an essential part of any physicist's toolkit. Classical physics is not 'old' physics; it contains many of the most interesting challenges to our understanding of nature and it stands (as in this book) in consistent juxtaposition with quantum physics. This book includes many interesting and often difficult problems, and it will particularly benefit students in the astrophysical and related sciences."--David Stevenson, Caltech

"This is an excellent resource for students and researchers seeking introductions to important subjects neglected by most modern physics curricula."--Jeremy Goodman, Princeton University

"This text is a tour de force. I cannot overemphasize how big a contribution to teaching it will be. It is also likely to instantly become a desk reference for a large part of the research physics community."--Steinn Sigurdsson, Pennsylvania State University

Kip S. Thorne is the Feynman Professor Emeritus of Theoretical Physics at Caltech. His books include *Gravitation and Black Holes* and *Time Warps*. Roger D. Blandford is the Luke Blossom Professor of Physics and the founding director of the Kavli Institute of Particle Astrophysics and Cosmology at Stanford University. Both are members of the National Academy of Sciences.

What's very slightly smaller than a breadbox, weighs about as much as one of those armored Chevy Suburbans favored by the Secret Service, and packed with most known information about relativity, optics, statistical mechanics, fluid and plasma dynamics, and elasticity? If you took the hint and guessed *Modern Classical Physics: Optics, Fluids, Plasmas, Elasticity, Relativity, and Statistical Physics* by Kip S. Thorne and Roger D. Blandford, you would be right. Yes, my hard copy finally arrived. Fans of Thorne's previous collaboration in the monster truck textbook category, *Gravitation*, with Misner and Wheeler may be heartened to note that MCP shares the same large page format, has nearly 300 more pages, and weighs a lot more, thanks in part to its hardcover format. As to exactly why this was published as a single volume, rather than three, four or even five normal sized

textbooks, I can only speculate, but my favorite is that it is the author's thumb in the eye to the stereotype of the puny and pusillanimous physics major. Pack this and MTW around campus for a while and you will soon have calves and guns like Dwayne Johnson.

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