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A Review of "Principles of Condensed Matter Physics" by P.M. Chaikin and T.C. Lubensky, Cambridge University Press, Cambridge, U.K., 2000, ISBN 0 521 79450 1(paperback); $47,95

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Book Review

"Principles of Condensed Matter Physics" by P.M. Chaikin and T.C. Lubensky, Cambridge University Press, Cambridge, U.K., 2000, ISBN 0 521 79450 1(paperback); $47,95.

The intended audience for this textbook is second year graduate students and researchers in condensed matter physics, materials science, chemistry, engineering and applied physics. A knowledge of quantum mechanics is useful but not essential. Statistical mechanics is a necessary background, and a course in solid state physics is helpful.

The objectives of the authors are to present a unified picture of structures such as liquid crystals, quasicrystals, classical fluids as well as periodic solids and to treat broken symmetry, critical phenomena, renormalization group and fluctuations and topological defects in phase transitions.

The material presented in the first six chapters is intended for a one semester course and develops the general framework for the study of condensed matter systems. The last four chapters cover applications of the material presented in chapters 1 through 6 to Dynamics, Hydrodynamics, Topological Defects and Walls, Kinks and Solitons which can be covered in a second semester. There are aproximately 10 problems at the end of each chapter at all levels of difficulty.

This book covers topics in modern condensed matter physics such as field theories, critical phenomena and renormalization group which are not discussed extensively in the standard advanced solid state physics texts. It therefore fills a gap in the background of graduate students and traditionally trained researchers who desire a systemic development of the principles of modern condensed matter physics. The major weakness of the book is the level of mathematical difficulty which may deter some readers.

I highly recommend this book for those who wish to gain an insight into the unifying themes underlying modern condensed matter physics with a caution concerning the mathematical background which is necessary.

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