



Symmetry and Condensed Matter Physics: A Computational Approach

By M. El-Batanouny, F. Wooten

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Unlike existing texts, this book blends for the first time three topics in physics - symmetry, condensed matter physics and computational methods - into one pedagogical textbook. It includes new concepts in mathematical crystallography, experimental methods capitalizing on symmetry aspects, non-conventional applications such as Fourier crystallography, color groups, quasicrystals and incommensurate systems, as well as concepts and techniques behind the Landau theory of phase transitions. Ideal for graduate students in condensed matter physics, materials science, and chemistry.

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Editorial Review

Review

"This text blends three topics in physics: symmetry, condensed matter physics, and computational methods. It covers new concepts in mathematical crystallography, experimental methods capitalizing on symmetry aspects, nonconventional applications such as Fourier crystallography, and concepts and techniques behind the Landau theory of phase transitions. The text adopts and develops a computational approach to the application of group theoretical techniques for solving symmetry-related problems. This alleviates the need for the intensive calculations usually found in the presentation of symmetry. Sample programs, based on Mathematica, are presented throughout. The book contains 150 exercises (with answers on a web site), and can be used by graduate students in condensed matter physics, materials sciences, and chemistry. El-Batanouny teaches physics at Boston University. Wooten (1928-2004) was professor of physics and chair of the department of applied science at the University of California-Davis."

Book News, Inc.

"This well-written book is directed towards people who want a technical understanding of group theory and its concrete applications to many fields of solid state and condensed matter physics at a high level of description."

Jean-Yves Fortin, Mathematical Reviews

About the Author

Michael EL-Batanouny is a professor in the Department of Physics at Boston University. His research area is experimental surface physics, and he has written numerous papers on solid state physics and surface physics.

Frederick Wooten (1928-2004) was Professor of Physics and Chair of the Department of Applied Science at the University of California, Davis. He is the author of Optical Properties of Solids, and numerous articles in the field of solid state physics, more recently in the area of materials science.

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