



Elements of Quantum Mechanics

By Michael D. Fayer

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Elements of Quantum Mechanics provides a solid grounding in the fundamentals of quantum theory and is designed for a first semester graduate or advanced undergraduate course in quantum mechanics for chemistry, chemical engineering, materials science, and physics students. The text includes full development of quantum theory. It begins with the most basic concepts of quantum theory, assuming only that students have some familiarity with such ideas as the uncertainty principle and quantized energy levels. Fayer's accessible approach presents balanced coverage of various quantum theory formalisms, such as the Schrödinger representation, raising and lowering operator techniques, the matrix representation, and density matrix methods. He includes a more extensive consideration of time dependent problems than is usually found in an introductory graduate course. Throughout the book, sufficient mathematical detail and classical mechanics background are provided to enable students to follow the quantum mechanical developments and analysis of physical phenomena. Fayer provides many examples and problems with fully detailed analytical solutions. Creating a distinctive flavor throughout, Fayer has produced a challenging text with exercises designed to help students become fluent in the concepts and language of modern quantum theory, facilitating their future understanding of more specialized topics. The book concludes with a section containing problems for each chapter that amplify and expand the topics covered in the book. A complete and detailed solution manual is available.

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Editorial Review

Review

"Elements of quantum mechanics provides a firm grounding for graduate students and researchers in physical chemistry, chemical physics and theoretical chemistry who are concerned with time-dependent phenomena. This book is also relevant for scientists in other disciplines such as physics, materials science, biophysics and engineering. Its clear style also makes the text accessible to undergraduates who want to learn about the more challenging and modern aspects of quantum mechanics." The Times Higher Education Supplement, November 2002.

About the Author

Michael D. Fayer, the D. M. Ehlers and E. C. Franklin Professor of Chemistry at Stanford University, is a member of the National Academy of Sciences, and has received the American Chemical Society E. Bright Wilson Award for Spectroscopy, the American Physical Society Earl K. Plyler Prize for Molecular Spectroscopy, and the Optical Society of America Ellis R. Lippincott Award. He has taught graduate quantum mechanics at Stanford for over thirty years.

A complete set of Power Point lectures for teaching using his book is available on his web site (<http://www.stanford.edu/group/fayer/>), and he will provide the complete Problem and Solution Manual in Word format to instructors upon request.

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