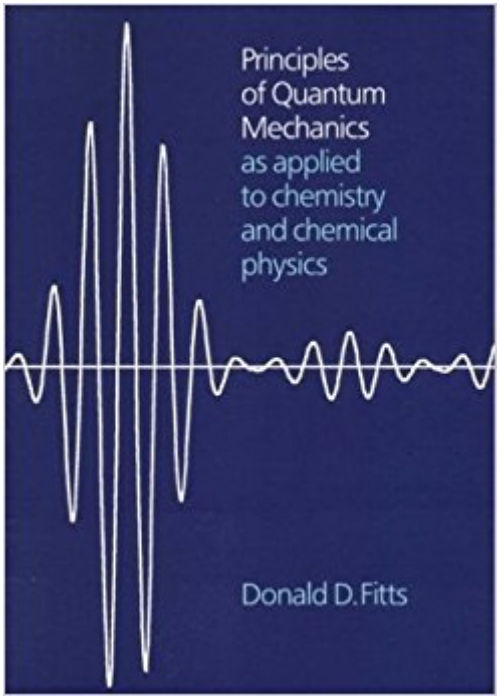
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Principles Of Quantum Mechanics: As Applied To Chemistry And Chemical Physics



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Synopsis

Quantum behavior encompasses a large fraction of modern science and technology, including the laws of chemistry and the properties of crystals, semiconductors, and superfluids. This graduate-level text presents the basic principles of quantum mechanics using modern mathematical techniques and theoretical concepts, such as hermitian operators, Hilbert space, Dirac notation, and ladder operators. The first two chapters serve as an introduction to quantum theory with a discussion of wave motion and SchrÃƒÂ¶dinger's wave mechanics. Coverage then details the fundamental principles of quantum mechanics. Throughout, basic theory is clearly illustrated and applied to the harmonic oscillator, angular momentum, the hydrogen atom, the variation method, perturbation theory, and nuclear motion. This volume is the ideal textbook for beginning graduate students in chemistry, chemical physics, molecular physics and materials science.

Book Information

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"Whoever is looking for a solid, pedagogically very well constructed, and easy to read introduction to quantum mechanics for chemists, chemical physicists, and molecular physicists will find it here. The good readability with simultaneous mathematical rigor... the book is an excellent textbook, from which students of chemistry and chemical physics can acquire necessary quantum-mechanical understanding and rigor. Also can be highly recommended to instructors for preparation of lectures." /s Zeitschrift fur Physikalische Chemie, vol 214, issue #9, 2000

Quantum behavior encompasses a large fraction of modern science and technology, including the laws of chemistry and the properties of crystals, semiconductors, superconductors, and superfluids. Applications of quantum mechanics give us transistors, computer chips and lasers. The relatively new field of molecular biology, which leads to our better understanding of biological structures and life processes, derives from quantum considerations. This book presents the basic principles of quantum mechanics using modern mathematical concepts and techniques, particularly as applied to chemistry and chemical physics.

I recently received this book and it had way better explanations for math concepts than any of my physics or math textbooks, if you are having trouble with Fourier series or Dirac delta function you may want a copy of this book lying around.

This is exactly what I was looking for when I wanted to put a face to some of the more complex theories and physics that I've been studying on my own about the fundamentals of some string and quantum mechanics theories. He starts from the beginning and goes nice and fast, however its nice small steps he takes, you can read it at any pace but its a LOT packed into it. I'm just glad he was able to finish it without going crazy :) Thanks for taking the time to split up the math and put it all together into one source. This makes it much easier to apply some theory with this kind of background. The math is easily layed out and forshadowed. the formulas and values are explained as they are used and each propogation is shown and explained. It assumes knowledge of physics but explains anyway. I'm not a graduate student, but I can understand it anway, great work.

Despite its title, this book contains few applications to chemistry. What distinguishes it from most QM texts is the absence of physics-specific applications like solid state, and the careful, step-by-step process by which the author derives results. I'd recommend it to anyone (chemist, physicist, whatever) who wants to know nonrelativistic quantum theory. It's also a handy reference for a few subjects that have wide use outside QM, like group velocity and spherical harmonics. The style is a bit dry, and I doubt that I'll ever read it cover to cover, but as a textbook it's hard to beat.

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