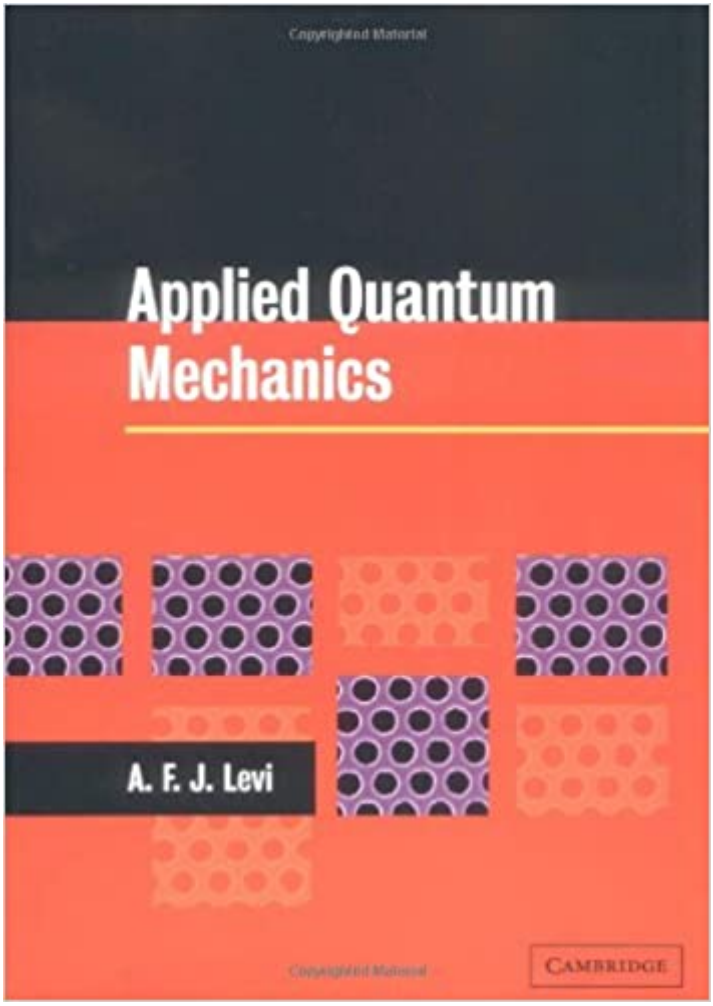
Applied Quantum Mechanics



Synopsis

This book takes quantum mechanics out of the theory books and into the real world, using practical engineering examples throughout. Levi’s unique, practical approach engages readers and keeps them motivated with numerous illustrations, exercises and worked solutions. Starting with some scene setting revision material on classical mechanics and electromagnetics, Levi takes the reader from first principles and Schroedinger’s equation on to more advanced topics including scattering, eigenstates, the harmonic oscillator and time-dependent perturbation theory. A CD-ROM is included which contains MATLAB source code to support the text. Quantum mechanics is usually thought of as being a difficult subject to master - this book sets out to prove it doesn’t need to be.

Book Information

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Customer Reviews

"Levi’s book represents a very large step in the right direction for teaching quantum mechanics to engineering students." Physics Today"Anyone who is practically minded and is eager to learn quantum mechanics will welcome this book." Comtemporary Physics, Mr. J. Hartley, (Imperial College London)

Written specifically for electronic and mechanical engineers and students, this book takes quantum mechanics out of the theory books and into the real world, using practical engineering examples throughout. Levi’s unique, practical approach engages the reader and keeps them motivated with numerous illustrations, exercises and worked solutions. Starting with some scene setting revision

material on classical mechanics and electromagnetics, Levi takes the reader from first principles and SchrÃƒÂ¶dinger's equation on to more advanced topics including scattering, eigenstates, the harmonic oscillator and time dependent perturbation theory. Includes MATLAB examples on CD-ROM.

It is a very good reference. I just expected for the way to have the codes inside in the book.

This book is an excelent introduction of quantum mechanics for engineers and non-physicists.

After a year long undergraduate sequence in quantum mechanics, I was left wondering what was the point to learning all this? Levi's book provides the answer. He quickly reviews basic quantum mechanics then delves deep into its applications with problems relevant to materials scientists and electrical engineers.With a good foundation in introductory QM, I found this book a very easy read. Levi did a great job on making complicated material very easy to understand. It is also a great text for self-study. However, I feel without my formal introduction to QM, I would have struggled reading this book. I would recommend this book for people with some prior knowledge in QM who want to apply that knowledge to more "quantum mechanic-y" engineering problems.

There is no shortage of quantum mechanics text to choose from. And if I had solely relied on the majority recommendations for an introductory text, I would have certainly missed this gem.The author is very successful presenting the recondite fundamentals of quantum mechanics in a manner accessible to material scientists and engineers. This is accomplished without losing the rigor necessary to build a strong foundation. Applications of concepts are dispersed through out the chapters and keep the reader's attention.But by the far the best selling point of this book are the worked problems at the end of the chapters. It is my personal opinion that if a textbook fails to at least provide final answers and solution hints to presented exercises, it is not really a textbook, but a reference reserved for those who have been adequately exposed to the material before. Here all end of the chapter questions are accompanied with worked solutions. This is a rarity among all undergrad or graduate science or engineering texts. This alone makes it valuable for self-study.To those completely uninitiated to quantum mechanics, I do not recommend this book as a sole source because it is not sufficiently self-contained. It would be best to complement it with "Introduction to Applied Quantum and Statistical Mechanics" by Hagelstein. I have yet to read "Applied Quantum Mechanics" by Kroemer, which has recieved much praise and appears to be another excellent

introductory source.

Levi's book differs from standard QM texts, in furnishing more of an applied bent. Directed towards those students in applied physics, materials science and engineering. For example, there is a superb chapter on electron propagation in crystals. Where we see how to describe propagation by transmission matrices. And how energy bands arise due to the periodicity of the potential seen by electrons. Of course, solid state texts also discuss this. But the treatment here of such ideas as tunnelling, and using the WKB approximation to describe that tunnelling in a semiquantitative manner, is clear and detailed. Plus, the examples focus on important heterostructures, where band gap engineering is important.For semiconductor lasers, there is a similar treatment. With comparisons amongst the common types of laser diodes, like GaAs and InGaAsP.The numerous problems and the copiously worked out examples are also a nice feature of the text.

This is a very practical quantum mechanics book. It tells you how to use quntum mechanics in many practical engineering situations. The worked problems at the end of each chapter help to enliven and reenforce the learning experience. The chapters on quantum tunneling is especially good. This book is suitable for students studying applied physics, materials science, electrical, electronic, mechanical engineering.

Series Book 0) The Feynman Lectures on Physics: Volume 1, Quantum Mechanics The Feynman Lectures on Physics: Volume 2, Advanced Quantum Mechanics Hidden in Plain Sight: The Simple Link Between Relativity and Quantum Mechanics: Hidden in Plain Sight, Book 1 The Black Hole War: My Battle to Make the World Safe for Quantum Mechanics Quantum Mechanics and Its Emergent Macrophysics