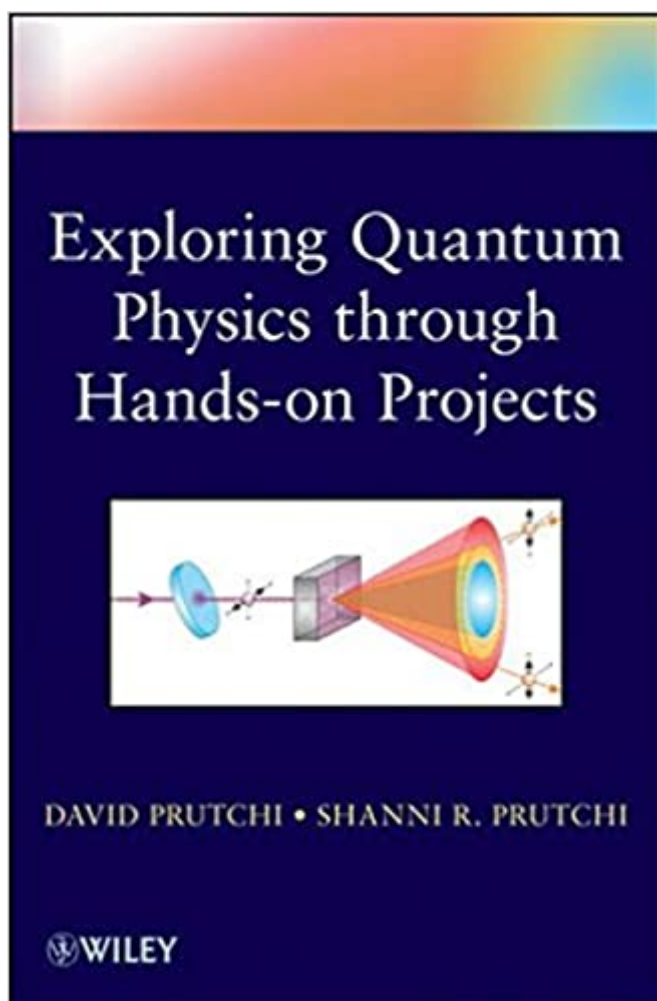


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# Exploring Quantum Physics Through Hands-on Projects



## Synopsis

Build an intuitive understanding of the principles behind quantum mechanics through practical construction and replication of original experiments. With easy-to-acquire, low-cost materials and basic knowledge of algebra and trigonometry, *Exploring Quantum Physics through Hands-on Projects* takes readers step by step through the process of re-creating scientific experiments that played an essential role in the creation and development of quantum mechanics. Presented in near chronological order – from discoveries of the early twentieth century to new material on entanglement – this book includes question- and experiment-filled chapters on: Light as a Wave, Light as Particles, Atoms and Radioactivity, The Principle of Quantum Physics, Wave/Particle Duality, The Uncertainty Principle, Schrödinger (and his Zombie Cat), Entanglement. From simple measurements of Planck's constant to testing violations of Bell's inequalities using entangled photons, *Exploring Quantum Physics through Hands-on Projects* not only immerses readers in the process of quantum mechanics, it provides insight into the history of the field – how the theories and discoveries apply to our world not only today, but also tomorrow. By immersing readers in groundbreaking experiments that can be performed at home, school, or in the lab, this first-ever, hands-on book successfully demystifies the world of quantum physics for all who seek to explore it – from science enthusiasts and undergrad physics students to practicing physicists and engineers.

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## Customer Reviews

“This unique book can also be highly recommended as supplementary reading, even in the absence of actual hands-on participation in the many projects described.” (Contemporary Physics, 6 December 2013)

Build an intuitive understanding of the principles behind quantum mechanics through practical construction and replication of original experiments. With easy-to-acquire, low-cost materials and basic knowledge of algebra and trigonometry, *Exploring Quantum Physics through Hands-on Projects* takes readers step by step through the process of re-creating scientific experiments that played an essential role in the creation and development of quantum mechanics. Presented in near chronological order; from discoveries of the early twentieth century to new material on entanglement; this book includes question- and experiment-filled chapters on: Light as a Wave, Light as Particles, Atoms and Radioactivity, The Principle of Quantum Physics, Wave/Particle Duality, The Uncertainty Principle, Schrödinger (and his Zombie Cat), Entanglement. From simple measurements of Planck's constant to testing violations of Bell's inequalities using entangled photons, *Exploring Quantum Physics through Hands-on Projects* not only immerses readers in the process of quantum mechanics, it gives them insight into the history of the field; how the theories and discoveries apply to our world not only today, but also tomorrow. By immersing readers in groundbreaking experiments that can be performed at home, school, or in the lab, this first-ever, hands-on book successfully demystifies the world of quantum physics for all who seek to explore it; from science enthusiasts and undergrad physics students to practicing physicists and engineers.

It's an expensive book, but it is interesting, fun and inspiring. The genius of this book is in the many experiments and their explanation. Even if the reader never performed any of the experiments they go a long ways towards clarifying Quantum Mechanics (and a number of other areas of physics) beyond the average textbook and providing an intuitive "feel" for the subject. A good book. However, I have two complaints. The cover of the book describes the experiments as being "relatively inexpensive" and that they use "readily available" parts. Although this is true for the majority of the experiments it's not true for some of them. A few of them would require quite a bit of luck locating components even if you could afford them. The other complaint is with the publisher because even though the book is a quality product the illustrations are very small. I literally needed to keep a magnifying glass with me in order to read the illustrations and I have average eyesight. Nevertheless, this book delivers and if the author were to write a similar book on another topic I

would be one of the first in line to buy it.

This book is the best amateur science book available today. It covers a difficult subject with such mastery that the authors make it seem easy. Much effort was put forth in finding ways to make the experiments affordable. A complete listing of web sites offering surplus equipment is provided. I have not done all the experiments listed, but the ones that I have done work exactly as described. Most of the topics of quantum physics are covered in historical order, so the reader gets a sense of how the story unfolded. Many of the great and now classical experiments are included from the wave-particle duality of light through the strange phenomenon of entanglement. Thru this book we all have a way to introduce the beauty of the micro world to our children and to ourselves. It is important to add that this was not achieved by skipping the hard parts. David and Shanni Prutchi have found a way to make difficult ideas simple and effective without sacrificing the truth. This elegance is the heart of science itself.

As a retired electrical engineer and student of physics I found Exploring Quantum Physics through Hands-On Projects totally absorbing. I believe I could set-up and operate most any of these experiment-demonstrations. Since there are significant (on my budget) costs involved to many of these experiments I choose to live through each of the set-ups and demonstrations vicariously. However, since the level of buildup is so well detailed I may use some of the instructions to build equipment for other uses.

(this is my first review a product ever in , my bad of course)Hi im a computer scientist, I met David and his daughter at hackaday superconference 2015, he and his daughter were an incredible source of motivation for me to start a really fun road back to physics, and even more on topics i havent tried before, book is really really good, it covers not only experimental setups and theory, but funny jokes and nice suggestions of where to find the equipment needed to replicate setups.I have compared the book with other sources online (other books, blogs, etc) but still a bit far from David.

If you find that lots of equations make your head hurt, but you do like to tinker with genuinely mind-bending aspects of the physical world, then this book is a great way to dive head first into the quantum realm. While this is DIY, it is not for beginners. Some experience with electronics is necessary to get the most of this workbook. But it's well worth it for those who like to test reality rather than take someone else's word for it.

Best explanations i ever read. Populer science books have little information, i can't understand the cause and effect relationship in them. Scientific text books are too complex and lots of calculations for me as a non-academic person. This book is just perfect to understand scientific facts in detail for ordinary people. I think, book achives this by explaining experiments which it also encourage ordinary man to perform.

addressed the printing formats and binding. Book is now well made. Project descriptions and diagrams are well laid out.

I bought this book to read myself and to share with my high-school daughter. The book is very accessible. It's easy to read. It seems to have a good theory to practice ratio. We haven't tried any experiments yet, but my son (who's in 5th grade) wants to do a modified (math free) version of the double slit experiment for his science fair. So, the book does have appeal and practice into grade school. This is a great source for ideas. It's a good general read. It doesn't seem to require anything other than an algebra 1 background. It's heartily recommended.

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