

Quantum Physics

Illusion or Reality?

SECOND EDITION

ALASTAIR RAE



Quantum Physics: Illusion or Reality?

Alastair I.M. Rae

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Quantum Physics: Illusion or Reality? Alastair I.M. Rae

The concept of Quantum Physics led Einstein to state that "God does not play dice." The difficulty he, and others, had with Quantum Physics was the great conceptual leap it requires taking from conventional ways of thinking about the physical world. Alastair Rae's introductory exploration into this area has been hailed as a "masterpiece of clarity" and is an engaging guide to the theories offered. This revised edition contains a new chapter covering theories developed during the past decade. Alastair Rae has been a Lecturer, a Senior Lecturer, then Reader in Quantum Physics in the School of Physics and Astronomy at University of Birmingham from 1967-2003. His publications include the First Edition of Quantum Physics, (Cambridge, 1994) and Quantum Mechanics (Institute of Physics, 2002), now in its Fourth Edition. First Edition Pb (1994): 0-521-46716-0

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From Reader Review Quantum Physics: Illusion or Reality? for online ebook

Joshua says

Companion book to one of my favorite classes ever, with one of my favorite prof's, if you think you know quantum mechanics, and you haven't studied it, it's a must read, get informed, learn the real science, not the pseudo new age stuff, this is the real deal right here, and you'll wonder why it needs to be distorted by some so called scientists, because it's fascinating unaltered

Antony says

I'm surprised that so many people found this book easy to understand. Apart from the section on Bell's theorem I thought this book was badly written and very confusing. And I'm a quantum physicist. I'm sure there must be better popular books in quantum mechanics out there.

Amr Khaled says

If you are concerned about learning quantum mechanics , i think this isn't the book you should read but if you have a background about the quantum world and you want to understand some of its concepts as a non-specialist , this will be the perfect book !

The author begins by explaining the weirdness of the quantum world in the first four chapters and i see he did his best to simplify the complexity of QM by using diagrams -except for bell's theorem part which i had to look for it on the internet-and repeating what does the results of a certain experiment mean.

At the end of the fourth chapter , when he explains Schrodinger's cat thought experiment , here begins the part i gave the book 5 stars for , The measurement problem that led to the different interpretations of QM "Copenhagen's - Multiverse - GRW - Thermodynamic irreversibility - Consistent histories".

From the fifth chapter, the book becomes a beautiful combination of physics and philosophy by explaining each interpretation from the scientific point of view and what does this imply on our understanding of reality.

Abdulmohsen Alghareeb says

Natalie S. says

You know how the random blank pages at the end of every book? Readers of *Quantum Physics: Illusion or Reality?* normally tear them out to use for "Goodbye, cruel world" notes.

That said, if you ever want to learn about quantum physics (you don't), this book is kind of helpful sort of sometimes.

John Rasmussen says

A great explanation for a very complex subject. Wonderful explanation without calculus.

Lauchlin says

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Charles says

Some interesting stuff, but pretty dry.

Ka says

Describes in a clear manner the different conceptual problems within the field of quantum theory, including its revolutionary implications for our understanding of the physical world. Chapters discussing the theory of consciousness-based quantum measurement as well as the 'many-worlds' approach, make for particularly interesting reading. One or two chapters would likely become difficult reading for non-physicists, but given the subject's complexity it is on the whole well explained.

Matthew says

Overall very good, maybe a little long for those who don't have a background in physics.

Abdulrahman F says

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Gary Patella says

If he ended the book two chapters earlier, this would've actually been 4 stars.

Alastair Rae did an excellent job describing many of the perplexing quantum phenomena. Rather than focusing only on the common bewildering experiments (e.g. the double slit), he describes many experiments involving the polarization of photons. The results of the described experiments are truly fascinating. I really enjoyed reading it.

Unfortunately, as we come to the end of the book, he cannot leave well enough alone. Rather than leaving us with the mystery of the quantum world, he decides to describe some of the "possible" explanations for the previously described phenomena. This is where the book takes a turn from scientific experimentation to outright made-up stories. Multiple universes, other dimensions, and all of this other science fiction is suddenly viewed as a viable explanation at the end. Sadly, the book that held my attention throughout did not end on a high note.

dead letter office says

if you want to know what's so weird about quantum mechanics, and you can tolerate some basic algebra, this book will lay it out for you.

David Hildebrand says

Relatively concise, could have been a couple ideas shorter. It falls into the abyss of talking about quantum mechanics without much to hang your hat on. It does what it intends (meander around the large paradoxes and describe some approaches) and is relatively forgettable.

Nick says

I wasn't exactly expecting to read about quantum physics much this year, but a discussion with my girlfriend that exhibited gaps in our understanding of physics prompted her to get me this book as a gift, so I was inspired to read it. It's not surprising that we have gaps in our understanding, as I haven't taken any physics since high school, and I think she hasn't needed any of the physics she took in college. But still.

This is not a math-y physics book. There are a few scattered equations, and even something like a proof, but it's really more of a philosophical discussion. The first few chapters discuss some interesting properties of light - in particular the wave/particle duality, and polarization. Experiments relating to these properties are described, and used to set up the central issue the rest of the book discusses, which is the "measurement problem". Unfortunately, as I started reading this book and thinking about the experiments, that was exactly the problem I was hoping to come to better terms with, and I was sorta surprised that it doesn't seem to have a good answer (yet?).

Basically the question goes: what constitutes a measurement? Measuring quantum properties is analogous to making a draw from a probability distribution. Until a measurement is made, we can only assign probabilities to the outcome, unlike in the classical realm. But who does the measuring? Is there something about our consciousness that's required to say a measurement has been made? What about Schrodinger's cat? Is it conscious enough? Whatever that means.

Very frustrating. After setting up the issue, the author spends the remaining chapters discussing ways people have attempted to address the question. Many viewpoints are discussed, and each is given a pretty fair treatment, pointing out both positive and negative aspects of the argument.

I kept reading in hopes that we'd get to the one without negatives, but it never came. Freaking real world, being all messy and stuff.

Anyway, there's still lots I don't understand, even at the more mechanical level of all this, instead of the philosophical (metaphysical?). Gotta read more...

It was sorta of entertaining to be a "trained mathematician" reading this book, especially the first few chapters that were actually more on the technical side. Definitions are scarce (I'm not blaming the author, I think we maybe don't even have the definitions). After the description of the wave/particle duality, the author talks about a beam of light... well what the hell's that? Is that actually a whole bunch of isolated protons, or is it something else, something more wavey? I don't know. Maybe I just didn't read closely enough or think hard enough about it. That's usually my problem.
