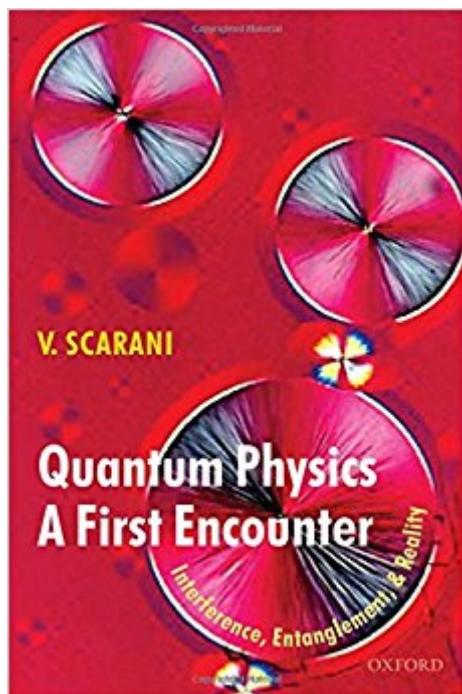


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# Quantum Physics: A First Encounter: Interference, Entanglement, And Reality



## Synopsis

Quantum physics is often perceived as a weird and abstract theory, which physicists must use in order to make correct predictions. But many recent experiments have shown that the weirdness of the theory simply mirrors the weirdness of phenomena: it is Nature itself, and not only our description of it, that behaves in an astonishing way. This book selects those, among these typical quantum phenomena, whose rigorous description requires neither the formalism, nor an important background in physics. The first part of the book deals with the phenomenon of single-particle interference, covering the historical questions of wave-particle duality, objective randomness and the boundary between the quantum and the classical world, but also the recent idea of quantum cryptography. The second part introduces the modern theme of entanglement, by presenting two-particle interference phenomena and discussing Bell's inequalities. A concise review of the main interpretations of quantum physics is provided.

## Book Information

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## Customer Reviews

‘A splendid exposition of the foundations of quantum mechanics for non-experts ... It is factually accurate, lucid, elegantly written, and informed with a proper sense of wonder, which it will convey to the reader.’ Abner Shimony, Boston University ‘An approach in the best style of Feynman.’ Michel Bitbol, Ecole Polytechnique ‘This book here stands out of the ordinary. Its straightforward style and jubilant tone calls to mind great popularizers such as Galileo, Gamow, Landau, or Feynman. [...] I have found this short book absolutely charming.’ Alain Laverne, Universite Paris 7

Valerio Scarani, Principal investigator at Centre for Quantum Technologies and professor, Department of Physics, National University of Singapore. Valerio Scarani received his degree in 1996 in the Ecole Polytechnique Federale, Lausanne (Switzerland), with a work in mathematical physics. He got his Ph.D. from the same institution four years later with an experimental research project in nuclear magnetic resonance. He moved to the group of Nicolas Gisin at the University of Geneva, where he started working in theoretical quantum information science. Since 2007 he has been at the National University of Singapore, where he is currently principal investigator at the Centre for Quantum Technologies and a professor in the Department of Physics.

This is probably the first 100 page book that I ever bought at this price. Valerio Scarani has presented a good approach to several of the mysteries of quantum mechanics (QM) based on actual experiments. I didn't really know the basis of quantum cryptography (not that I was searching for one) but he explained it well. The ideas presented in this book are verbal explanations that one can keep in mind when studying QM in more depth.

I did some quantum computing work and became very interested in quantum physics as a result. This book is a very good starting place. It's wonderfully written and very clearly presented. It explores the various experiments that lead to our current understanding (or lack thereof) of quantum physics in a very effective way - the author takes you one step at a time, leading you through the same thought processes that the scientists designing the experiments went through. It's a very nice balance of history, story-telling, and science. I highly recommend it.

My compliments to the translator who did a fairly decent job. In the whole book there are only about 20 sentences that are grammatically awkward. The author himself does a fairly decent job as well. His technique is to explain quantum phenomena through interferometry experiments. This allows him to avoid all mathematics and yet, still get his point across. An enjoyable read.

Quantum Physics: A First Encounter: Interference, Entanglement, and Reality by Valerio Scarani is a very readable and informative introduction to quantum physics. The book has several notable strengths. Firstly the reflective didactic method that engages the reader and conveys clearly the fundamentals of the subject. Secondly, as opposed to several other popular expositions on the subject, Scarani conveys the extraordinary novelty and significance of non-locality. Additionally, there is a refreshingly detached attitude to the subject's intrinsic significance. Rather than the

common unscientific triumphalistic assertions of the completeness and unassailability of quantum physics, Scarani emphasises the intrinsic limitations of what can only be descriptions of reality, and the need to maintain a sense of wonder and openness to phenomena. Finally, the book is short, and hence practically readable.CR French

I've looked at a lot of basic books on quantum theory. This is the best one I've seen so far. It does a remarkably good job of giving newcomers an insight into the phenomena of interference and entanglement, all the more so given that there's almost no math in the book. Scarani is a serious researcher in his own right, but this book makes clear that he is also a gifted teacher.BTW: ignore the one-star review. It's not Scarani's fault that the customer didn't get his copy of the book.

I would not give this a five star rating only because it is not PERFECT! I actually intend to give it a 4 1/2 rating in fact.I liked this book for four things: 1) This is such a small book. (Lesser the words one speaks, the better to listen). 2) No technical blabbering, but STILL maintains clarity of concepts. 3) Tells about real experiments. 4) One of the latest on the old subject (as of July 2006!).Now to give an example of the minor defects that I noticed - The Unbalanced Franson's Interferometer explanation could leave the novice reader confused as to why the tiny time difference could not lead to distinguishability. There is nothing in the main text that even hints about this.All in all, this is a MUST BUY for all 'physics-maths' kind of people who have are new to QM.

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