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Título: World According To Quantum Mechanics. Why The Laws Of Physics Make Perfect Sense

Autor: Mohrhoff, Ulrich

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Sinopsis

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An invaluable supplement to standard textbooks on quantum mechanics, this unique introduction to the general theoretical framework of contemporary physics focuses on conceptual, epistemological, and ontological issues. The theory is developed by pursuing the question: what does it take to have material objects that neither collapse nor explode as soon as they are formed? The stability of matter thus emerges as the chief reason why the laws of physics have the particular form that they do.

The first of the book's three parts familiarizes the reader with the basics through a brief historical survey and by following Feynman's route to the Schrödinger equation. The necessary mathematics, including the special theory of relativity, is introduced along the way, to the point that all relevant theoretical concepts can be adequately grasped. Part II takes a closer look. As the theory takes shape, it is applied to various experimental arrangements. Several of these are central to the discussion in the final part, which aims at making epistemological and ontological sense of the theory. Pivotal to this task is an understanding of the special status that quantum mechanics attributes to measurements _ without dragging in "the consciousness of the observer." Key to this understanding is a rigorous definition of "macroscopic" which, while rarely even attempted, is provided in this book.