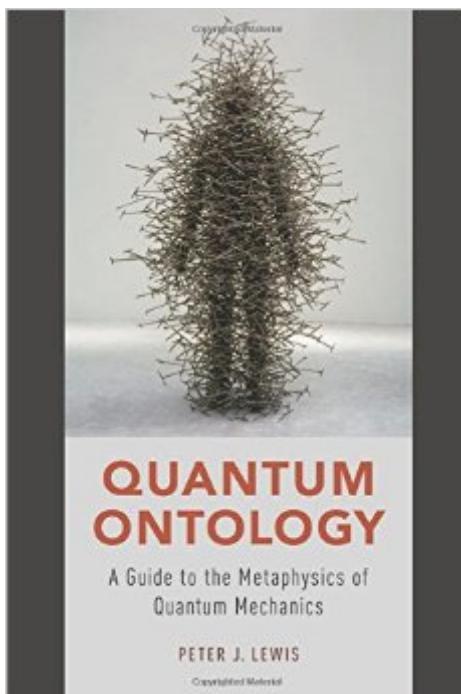


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Quantum Ontology: A Guide To The Metaphysics Of Quantum Mechanics



Synopsis

Metaphysicians should pay attention to quantum mechanics. Why? Not because it provides definitive answers to many metaphysical questions—the theory itself is remarkably silent on the nature of the physical world, and the various interpretations of the theory on offer present conflicting ontological pictures. Rather, quantum mechanics is essential to the metaphysician because it reshapes standard metaphysical debates and opens up unforeseen new metaphysical possibilities. Even if quantum mechanics provides few clear answers, there are good reasons to think that any adequate understanding of the quantum world will result in a radical reshaping of our classical world-view in some way or other. Whatever the world is like at the atomic scale, it is almost certainly not the swarm of particles pushed around by forces that is often presupposed. This book guides readers through the theory of quantum mechanics and its implications for metaphysics in a clear and accessible way. The theory and its various interpretations are presented with a minimum of technicality. The consequences of these interpretations for metaphysical debates concerning realism, indeterminacy, causation, determinism, holism, and individuality (among other topics) are explored in detail, stressing the novel form that the debates take given the empirical facts in the quantum domain. While quantum mechanics may not deliver unconditional pronouncements on these issues, the range of possibilities consistent with our knowledge of the empirical world is relatively small—and each possibility is metaphysically revisionary in some way. This book will appeal to researchers, students, and anybody else interested in how science informs our world-view.

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Customer Reviews

"Lewis's book is an excellent introduction to this debate...it is inspiring to those looking for places to apply their philosophical efforts." -- Notre Dame Philosophical Reviews Online

Peter Lewis is Associate Professor of Philosophy at the University of Miami. He studied physics at Oxford University and philosophy at the University of California, Irvine. His main research interest is how to understand quantum mechanics as a description of the physical world. He has published a number of articles in influential journals on various facets of this project.

A book at the intersection of quantum mechanics and metaphysics. Lewis focuses on the three dominant interpretations of quantum mechanics and various of their variations exploring the advantages and disadvantages of each from a viewpoint of the metaphysical ontology (the philosophy of what exists or what is real) of the universe and our experience. On the whole the book delivers on what it promises. While it fails to come to any definite conclusions, the author is clearly biased towards "the many worlds" view, one of the three dominant interpretations of quantum mechanics. When I first bought the book I searched it for a mention of my own favorite interpretation, the "transactional theory" of Cramer and Ruth Kastner (see my review of her book "Understanding our Unseen Reality: Solving Quantum Riddles"). Lewis casts this interpretation as one of a class involving temporally reversed cause. Oddly he fails to mention that Kastner herself rejects this interpretation based precisely on a unique ontological commitment; that quantum phenomena take place outside (as Kastner puts it "underneath") timespace. In her view, the quantum phenomena only appear to be causally reversed from a viewpoint within time but in reality no such reversal occurs because prior to the phenomena being particularized as energy is transferred in timespace they occur outside of it. This is a big ontological consequence that Lewis utterly fails to notice. But aside from this quibble, the book is a good review of the dominant interpretations of quantum mechanical phenomena and their associated ontological implications.

The ongoing quantum debate regarding the intertwined nature of mind and the physics of matter were not touched here. I thought since the word Ontology was in the title I would get more philosophy. I thought this book would reflect and discuss a system of belief. The book is great for the maths and I couldn't put it down, because it makes the maths very clear and gratifying, but this is a book for Epistemologists who see the wave function as a description of our scientific knowledge and its limitation. I did not find much enlightenment here outside the maths. I was hoping for more philosophy I guess. For the maths side of the quantum physics this book was enlightening

and clear.

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