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# Quantum Theory David Bohm

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Emergent Quantum Mechanics  
Causality and Chance in Modern Physics  
Quantum Mechanics  
David Bohm's World  
Infinite Potential  
Quantum Implications  
The Infamous Boundary  
The Quantum Theory of Motion  
What Is Real?  
Philosophy of Quantum Mechanics  
Unfolding Meaning  
Bohmian Mechanics and Quantum Theory: An Appraisal  
Lost Causes in and beyond Physics  
Science, Order, and Creativity  
The Undivided Universe  
Conceptual Foundations of Quantum Physics  
Bridging Science and Spirit  
Wholeness and the Implicate Order  
David Bohm: Causality and Chance, Letters to Three Women  
Quantum Theory  
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Bohmian Mechanics  
The Essential David Bohm  
On Creativity  
The Mystery of the Quantum World  
Quantum Theory  
The Limits of Thought  
Physics and the Ultimate Significance of Time  
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David Bohm's Critique of Modern Physics  
Making Sense of Quantum Mechanics  
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The Special Theory of Relativity  
Applied Bohmian Mechanics  
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The Special Theory of Relativity

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*Emergent Quantum Mechanics* Basic Books

Emergent quantum mechanics explores the possibility of an ontology for quantum mechanics. The resurgence of interest in "deeper-level" theories for quantum phenomena challenges the standard, textbook interpretation. The book presents expert views that critically evaluate the significance—for 21st century physics—of ontological quantum mechanics, an approach that David Bohm helped pioneer. The possibility of a deterministic quantum theory was first introduced with the original de Broglie-Bohm theory, which has also been developed as Bohmian mechanics. The wide range of perspectives that were contributed to this book on the occasion of David Bohm's centennial celebration provide ample evidence for the physical consistency of ontological quantum mechanics. The book addresses deeper-level questions such as the following: Is reality intrinsically random or fundamentally interconnected? Is the universe local or nonlocal? Might a radically new conception of reality include a form of quantum causality or quantum ontology? What is the role of the experimenter agent? As the book demonstrates, the advancement of 'quantum ontology'—as a scientific concept—marks a clear break with classical reality. The search for quantum reality entails unconventional causal structures and non-classical ontology, which can be fully consistent with the known record of quantum observations in the laboratory.

*Causality and Chance in Modern Physics* Routledge

First published in 1995. Routledge is an imprint of Taylor & Francis, an informa

company.

*Quantum Mechanics* Courier Corporation  
*Infinite Potential* is the first biography of David Bohm—brilliant physicist, explorer of consciousness, student of Oppenheimer, friend to Einstein, and enemy of the House Committee on Un-American Activities. Although he battled bouts of crippling depression, Bohm proved to be one of the twentieth century's most original thinkers, influencing the fields of physics, philosophy, psychology, language, and education. In this compelling narrative, David Peat explains Bohm's life and landmark scientific work, including his famous "hidden variables" causal interpretation of quantum mechanics, which created a storm of controversy, yet may well be the only theory that describes the true nature of reality.

*David Bohm's World* Springer Nature  
 This advanced undergraduate-level text presents the quantum theory in terms of qualitative and imaginative concepts, followed by specific applications worked out in mathematical detail.

**Infinite Potential** Routledge

Creativity is fundamental to human experience. In *On Creativity* David Bohm, the world-renowned scientist, investigates the phenomenon from all sides: not only the creativity of invention and of imagination but also that of perception and of discovery. This is a remarkable and life-affirming book by one of the most far-sighted thinkers of modern times.

*Quantum Implications* Kendall Hunt

This book deals with a selection of research topics in theoretical physics that have (almost) been proven to be a dead-end or continue at least to be highly controversial. Nevertheless, small but dedicated research communities continue to work on these issues. In a

series of essays this book describes their work and struggle as well as the chances of any breakthrough in these areas. It is written as both an entertainment and serious study.

*The Infamous Boundary* SUNY Press

David Bohm is a physicist with a broad range of other interests including religion, philosophy, education, art, and linguistics. This book surveys Bohm's physical theories including the quantum potential theory and the implicate order or holomovement theory.

### **The Quantum Theory of Motion**

Psychology Press

David Bohm was one of the foremost scientific thinkers and philosophers of our time. Although deeply influenced by Einstein, he was also, more unusually for a scientist, inspired by mysticism.

Indeed, in the 1970s and 1980s he made contact with both J. Krishnamurti and the Dalai Lama whose teachings helped shape his work. In both science and philosophy, Bohm's main concern was with understanding the nature of reality in general and of consciousness in particular. In this classic work he develops a theory of quantum physics which treats the totality of existence as an unbroken whole. Writing clearly and without technical jargon, he makes complex ideas accessible to anyone interested in the nature of reality.

**What Is Real?** Springer Science & Business Media

First Published in 2000. Routledge is an imprint of Taylor & Francis, an informa company.

### **Philosophy of Quantum Mechanics**

Springer

Bohmian Mechanics was formulated in 1952 by David Bohm as a complete theory of quantum phenomena based on a particle picture. It was promoted some decades later by John S. Bell, who,

intrigued by the manifestly nonlocal structure of the theory, was led to his famous Bell's inequalities. Experimental tests of the inequalities verified that nature is indeed nonlocal. Bohmian mechanics has since then prospered as the straightforward completion of quantum mechanics. This book provides a systematic introduction to Bohmian mechanics and to the mathematical abstractions of quantum mechanics, which range from the self-adjointness of the Schrödinger operator to scattering theory. It explains how the quantum formalism emerges when Boltzmann's ideas about statistical mechanics are applied to Bohmian mechanics. The book is self-contained, mathematically rigorous and an ideal starting point for a fundamental approach to quantum mechanics. It will appeal to students and newcomers to the field, as well as to established scientists seeking a clear exposition of the theory.

Unfolding Meaning Springer

An explanation of how quantum processes may be visualised without ambiguity, in terms of a simple physical model.

*Bohmian Mechanics and Quantum*

*Theory: An Appraisal* Psychology Press

This book explains, in simple terms, with a minimum of mathematics, why things can appear to be in two places at the same time, why correlations between simultaneous events occurring far apart cannot be explained by local mechanisms, and why, nevertheless, the quantum theory can be understood in terms of matter in motion. No need to worry, as some people do, whether a cat can be both dead and alive, whether the moon is there when nobody looks at it, or whether quantum systems need an observer to acquire definite properties. The author's inimitable and even

humorous style makes the book a pleasure to read while bringing a new clarity to many of the longstanding puzzles of quantum physics.

*Lost Causes in and beyond Physics*

Routledge

Why does one theory "succeed" while another, possibly clearer interpretation, fails? By exploring two observationally equivalent yet conceptually incompatible views of quantum mechanics, James T. Cushing shows how historical contingency can be crucial to determining a theory's construction and its position among competing views.

Since the late 1920s, the theory formulated by Niels Bohr and his colleagues at Copenhagen has been the dominant interpretation of quantum mechanics. Yet an alternative interpretation, rooted in the work of Louis de Broglie in the early 1920s and reformulated and extended by David Bohm in the 1950s, equally well explains the observational data. Through a detailed historical and sociological study of the physicists who developed different theories of quantum mechanics, the debates within and between opposing camps, and the receptions given to each theory, Cushing shows that despite the preeminence of the Copenhagen view, the Bohm interpretation cannot be ignored. Cushing contends that the Copenhagen interpretation became widely accepted not because it is a better explanation of subatomic phenomena than is Bohm's, but because it happened to appear first. Focusing on the philosophical, social, and cultural forces that shaped one of the most important developments in modern physics, this provocative book examines the role that timing can play in the establishment of theory and explanation.

*Science, Order, and Creativity*

Cambridge University Press

Challenges the conventional view of the nature of time.

*The Undivided Universe* Springer Science & Business Media

This book is a critical introduction to the long-standing debate concerning the conceptual foundations of quantum mechanics and the problems it has posed for physicists and philosophers from Einstein to the present. Quantum theory has been a major influence on postmodernism, and presents significant problems for realists. Keeping his own realist position in check, Christopher Norris subjects a wide range of key opponents and supporters of realism to a high and equal level of scrutiny. With a characteristic combination of rigour and intellectual generosity, he draws out the merits and weaknesses from opposing arguments. In a sequence of closely argued chapters, Norris examines the premises of orthodox quantum theory, as developed most influentially by Bohr and Heisenberg, and its impact on various philosophical developments. These include the ideas developed by W.V Quine, Thomas Kuhn, Michael Dummett, Bas van Fraassen, and Hilary Putnam. In each case, Norris argues, these thinkers have been influenced by the orthodox construal of quantum mechanics as requiring drastic revision of principles which had hitherto defined the very nature of scientific method, causal explanation and rational enquiry. Putting the case for a realist approach which adheres to well-tried scientific principles of causal reasoning and inference to the best explanation, Christopher Norris clarifies these debates to a non-specialist readership and scholars of philosophy, science studies and the philosophy of science alike. Quantum Theory and the Flight

From Realism suggests that philosophical reflection can contribute to a better understanding of these crucial, current issues.

Conceptual Foundations of Quantum Physics Springer Science & Business Media

Quantum mechanics stands as one of the most remarkable achievements of the 20th century, providing startling insight into the nature of matter and a spectacularly successful predictive theory. However, while the predictive ability of the quantum theory has been rigorously tested time and again, so that it now satisfies any criterion of reliability as a tool of scientific inquiry, fundamental difficulties remain with its interpretation. *The Mystery of the Quantum World, Second Edition* introduces the philosophical issues raised by the success of the quantum theory and lucidly outlines the different points of view adopted by various physicists striving to understand the meaning underlying the theories used every day. The author encourages you to see how the most successful of physical theories is relevant to issues outside physics. Revised and expanded, this edition includes a new chapter that introduces the most important of the recent developments in quantum theory. The authoritative selection of topics ensures that readers already familiar with the first edition of the book will extend their knowledge of quantum theory, and those with no previous knowledge acquire an insight into this fascinating world.

**Bridging Science and Spirit** Springer  
 "A thorough, illuminating exploration of the most consequential controversy raging in modern science." --New York Times Book Review  
 An Editor's Choice, New York Times Book Review Longlisted

for PEN/E.O. Wilson Prize for Literary Science Writing Longlisted for Goodreads Choice Award  
 Every physicist agrees quantum mechanics is among humanity's finest scientific achievements. But ask what it means, and the result will be a brawl. For a century, most physicists have followed Niels Bohr's solipsistic and poorly reasoned Copenhagen interpretation. Indeed, questioning it has long meant professional ruin, yet some daring physicists, such as John Bell, David Bohm, and Hugh Everett, persisted in seeking the true meaning of quantum mechanics. *What Is Real?* is the gripping story of this battle of ideas and the courageous scientists who dared to stand up for truth. "An excellent, accessible account." --Wall Street Journal  
 "Splendid. . . . Deeply detailed research, accompanied by charming anecdotes about the scientists." --Washington Post  
*Wholeness and the Implicate Order*  
 Springer Nature

There are few scientists of the twentieth century whose life's work has created more excitement and controversy than that of physicist David Bohm (1917-1992). For the first time in a single volume, *The Essential David Bohm* offers a comprehensive overview of Bohm's original works from a non-technical perspective. Including three chapters of previously unpublished material, and a forward by the Dalai Lama, each reading has been selected to highlight some aspect of the implicate order process, and to provide an introduction to one of the most provocative thinkers of our time.

David Bohm: Causality and Chance, Letters to Three Women Addison-Wesley Longman

In this classic work David Bohm, writing clearly and without technical jargon,

develops a theory of quantum physics which treats the totality of existence as an unbroken whole.

Quantum Theory Springer

The book presents the theory of relativity as a unified whole. By showing that the concepts of this theory are

interrelated to form a unified totality

David Bohm supplements some of the more specialist courses which have tended to give students a fragmentary impression of the logical and conceptual nature of physics as a whole.