



# Quantum Concepts in Physics: An Alternative Approach to the Understanding of Quantum Mechanics

By Malcolm Longair

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## Quantum Concepts in Physics: An Alternative Approach to the Understanding of Quantum Mechanics By Malcolm Longair

Written for advanced undergraduates, physicists, and historians and philosophers of physics, this book tells the story of the development of our understanding of quantum phenomena through the extraordinary years of the first three decades of the twentieth century. Rather than following the standard axiomatic approach, this book adopts a historical perspective, explaining clearly and authoritatively how pioneers such as Heisenberg, Schrodinger, Pauli and Dirac developed the fundamentals of quantum mechanics and merged them into a coherent theory, and why the mathematical infrastructure of quantum mechanics has to be as complex as it is. The author creates a compelling narrative, providing a remarkable example of how physics and mathematics work in practice. The book encourages an enhanced appreciation of the interaction between mathematics, theory and experiment, helping the reader gain a deeper understanding of the development and content of quantum mechanics than any other text at this level.

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"... will be extremely useful to instructors in quantum physics courses who wish to include some of the material in their own lectures. It should be required reading for those working in the philosophy or history of physics. An accessible, comprehensive treatment of the development of quantum mechanics. Highly recommended."

M. C. Ogilvie, Washington University, Choice

"... a beautiful book ... should be included in any respectable physics library."

Daniela Dragoman, Optics and Photonics News

#### **About the Author**

Malcolm Longair is Emeritus Jacksonian Professor of Natural Philosophy and Director of Development at the Cavendish Laboratory, University of Cambridge. He has held many highly distinguished positions within physics and astronomy and has served on and chaired many international committees, boards and panels, working with both NASA and the European Space Agency. He has received much recognition for his work, including the Pilkington Prize of the University of Cambridge for Excellence in Teaching and a CBE in the millennium honours list for his services to astronomy and cosmology. His previous well-received books for Cambridge University Press include Theoretical Concepts in Physics (2003), The Cosmic Century: A History of Astrophysics and Cosmology (2005) and High Energy Astrophysics (2011).

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