



# Quantum Physics: A Fundamental Approach to Modern Physics

By John Townsend

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This brilliantly innovative textbook is intended as a first introduction to quantum mechanics and its applications. Townsend's new text shuns the historical ordering that characterizes so-called Modern Physics textbooks and applies a truly modern approach to this subject, starting instead with contemporary single-photon and single-atom interference experiments. The text progresses naturally from a thorough introduction to wave mechanics through applications of quantum mechanics to solid-state, nuclear, and particle physics, thereby including most of the topics normally presented in a Modern Physics course. Examples of topics include blackbody radiation, Bose-Einstein condensation, the band-structure of solids and the silicon revolution, the curve of binding energy and nuclear fission and fusion, and the Standard Model of particle physics. Students can see in quantum mechanics a common thread that ties these topics into a coherent picture of how the world works, a picture that gives students confidence that quantum mechanics really works, too. The book also includes a chapter-length appendix on special relativity for the benefit of students who have not had a previous exposure to this subject. Also available is an accompanying, detailed Instructor's Solutions Manual for adopting professors.

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## **Editorial Review**

### **Review**

When I read this book I immediately adopted it for my sophomore Modern Physics class. This is the best introduction to quantum mechanics available. --B. Paul Padley, Rice University

Townsend has written an excellent book that someone needed to write for the Modern Physics textbook market. He has given it the same care that he gave to his excellent quantum mechanics book. --Jeff Dunham, Middlebury College

### **About the Author**

John S. Townsend is the Susan and Bruce Worster Professor of Physics at Harvey Mudd College, the science and engineering college of the Claremont Colleges. He received his B.S. from Duke University, his Ph.D. from Johns Hopkins University, and was a National Science Foundation Graduate Fellow. He has been a visiting professor at Caltech, the University of Southampton in England, Duke University and Swarthmore College, and he was a Science Fellow at the Center for International Security and Arms Control at Stanford University. He loves teaching, especially quantum physics. Townsend is also the author of A Modern Approach to Quantum Mechanics.

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