

Quantum Mechanics in Nanoscience and Engineering

Quantum Mechanics in Nanoscience and Engineering covers both elementary and advanced quantum mechanics within a coherent and self-contained framework. Undergraduate students of physics, chemistry, and engineering will find comprehensive coverage of their introductory quantum mechanics courses, and graduate students will gain an understanding of additional tools and concepts necessary to describe real-world phenomena. Each topic presented is first motivated by an experimental technique, phenomenon, or concept derived directly from the realm of nanoscience and technology. The machinery of quantum mechanics is described and reinforced through the perspective of nanoscale phenomena, and in this manner practical and fundamental questions are raised and answered. The main text remains fluent and accessible by leaving technical details and mathematical proofs to guided exercises. Introductory readers may overlook these exercises, while rigorous students can benefit from reading the guidance or solving the exercises in full to strengthen and consolidate their understanding of the material.

Uri Peskin is Professor of Chemistry and a member of the Russell Berrie Nanotechnology Institute and the Helen Diller quantum center at Technion – Israel Institute of Technology. His expertise lies in atomic and molecular physics and scientific computing, with emphasis on quantum dynamics on the nanoscale. He was a postdoctoral fellow at the University of California at Berkeley, and a visiting professor at Harvard and Freiburg universities. His research and teaching of quantum mechanics has won him several awards, including the Yanai Prize for Excellence in Academic Education.

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