

# Problems and Solutions in Physics 2011

:: Forthcoming

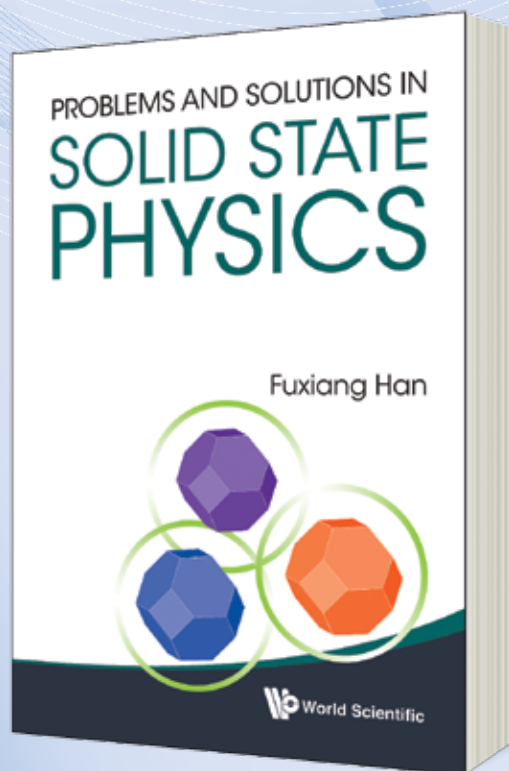
## PROBLEMS AND SOLUTIONS IN SOLID STATE PHYSICS

by **Fuxiang Han** (*Dalian University of Technology, China*)

This book provides a practical approach to consolidate one's acquired knowledge or to learn new concepts in solid state physics through solving problems. It contains 300 problems on various subjects of solid state physics. The problems in this book can be used as homework assignments in an introductory or advanced course on solid state physics for undergraduate or graduate students.

**Contents:** Drude Theory of Metals; Sommerfeld Theory of Metals; Bravais Lattice; Point Groups; Classification of Bravais Lattices; Space Groups of Crystal Structures; Scattering of X-Rays by a Crystal; Reciprocal Lattice; X-Ray Diffraction on Crystals; Crystal Structure by Neutron Diffraction; Bonding in Solids; Cohesion of Solids; Normal Modes of Lattice Vibrations; Quantum Theory of Lattice Vibrations; Inelastic Neutron Scattering by Phonons; Origin of Electronic Energy Bands; Electrons in a Weak Periodic Potential; Methods for Band Structure Computations; Dynamics of Bloch Electrons in Electric Fields; and other topics.

500pp	Fall 2011	
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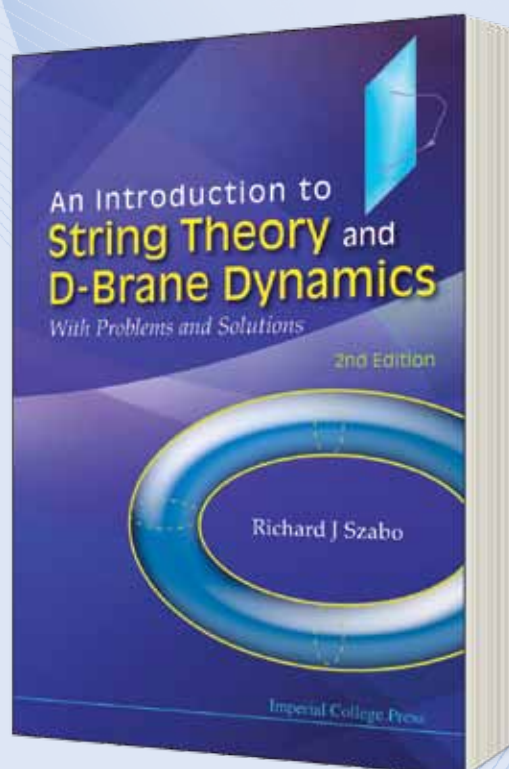
With Problems and Solutions  
(2nd Edition)

by **Richard J Szabo** (*Heriot-Watt University, UK*)

This invaluable book provides a quick introduction to the rudiments of perturbative string theory and a detailed introduction to the more current topic of D-brane dynamics. The presentation is very pedagogical, with much of the technical detail streamlined. The rapid but highly coherent introduction to the subject is perhaps what distinguishes this book from other string theory or D-brane books. This second edition includes an additional appendix with solutions to the exercises, thus expanding on some of the technical material and making the book more appealing for use in lecture courses. The material is based on mini-courses in theoretical high energy physics delivered by the author at various summer schools, so its actual level has been appropriately tested.

**Contents:** A Brief History of String Theory; Classical String Theory; Quantization of the Bosonic String; Superstrings; Ramond–Ramond Charges and T-Duality; D-Branes and Gauge Theory; D-Brane Dynamics; Ramond–Ramond Couplings of D-Branes; Solutions to Exercises.

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# Problems and Solutions in Physics 2011

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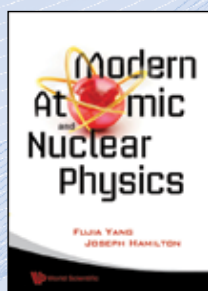
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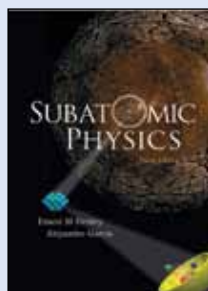
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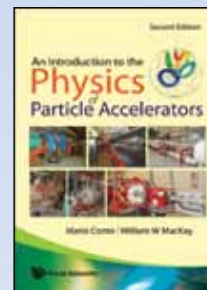
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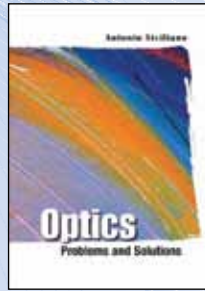
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*"The authors present an interesting book explaining group theory in terms of physics, closing an often observed gap in the literature between abstract mathematical theory and physical applications ... It is self-contained as much as is possible. Many examples and exercises, including solutions, allow the reader to become more familiar with the subject."*

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<b>476pp</b>	<b>Jun 2004</b>	
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**PROBLEMS AND SOLUTIONS IN SCIENTIFIC COMPUTING WITH C++ AND JAVA SIMULATIONS**by **Willi-Hans Steeb, Yorick Hardy, Alexandre Hardy** (Rand Afrikaans University, South Africa), & **Ruedi Stoop** (Institute for Neuroinformatics, Switzerland)

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**Contents:** Quickies; Bitwise Operations; Number Manipulations; Combinatorial Problems; Matrix Calculus; Recursion; Finite State Machines; Lists, Trees and Queues; Numerical Techniques; Random Numbers and Monte Carlo Techniques; Ordinary Differential Equations; Partial Differential Equations; Wavelets; Graphs; and other topics.

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<b>728pp</b>	<b>Mar 2000</b>	
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# Problems and Solutions in Physics 2011

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## ADVANCES IN ATOMIC PHYSICS

### An Overview

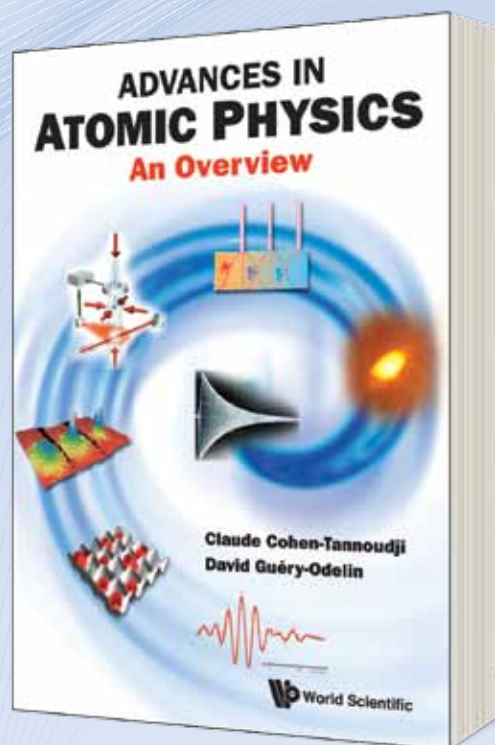
by **Claude Cohen-Tannoudji** (Laboratory Kastler Brossel, France) &  
**David Guéry-Odelin** (Laboratory Collisions Agrégats Réactivité, France)

*"Advances in Atomic Physics" by Claude Cohen-Tannoudji and David Guéry-Odelin is destined to become a classic. This book describes the spectacular advances of recent decades that have transformed atomic physics into one of the most exciting fields in science. The single volume constitutes a guide, a handbook, a textbook, and an encyclopedia of atomic physics. Throughout, the voice of Claude Cohen-Tannoudji--whose own contributions were seminal to this transformation and whose lectures at the Collège de France are legendary--rings through with the elegance and transparency that rank him as among the great teachers of our time.*

**Dan Kleppner** (MIT)

This book presents a comprehensive overview of the spectacular advances seen in atomic physics during the last 50 years. The authors explain how such progress was possible by highlighting connections between developments that occurred at different times. They discuss the new perspectives and the new research fields that look promising. The emphasis is placed, not on detailed calculations, but rather on physical ideas. Combining both theoretical and experimental considerations, the book will be of interest to a wide range of students, teachers and researchers in quantum and atomic physics.

**Contents:** General Background; Optical Methods; Linear Superpositions of Internal Atomic States; Resonance Fluorescence; Advances in High Resolution Spectroscopy; Perturbations Due to a Quasi Resonant Optical Excitation; Perturbations Due to a High Frequency Excitation; Multiphoton Processes Between Discrete States; Photoionization of Atoms in Intense Laser fields; Radiative Forces; Laser Cooling of Two-Level Atoms; Sub-Doppler Cooling, Sub-Recoil Cooling; Trapping of Particles; Two-Body Interactions at Low Temperature; Controlling Atom-Atom Interactions; Interference of Atomic de Broglie Waves; and other topics.



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## BCS: 50 YEARS

edited by **Leon N Cooper** & **Dmitri Feldman** (Brown)

*"This exceptionally well written and edited book celebrates and reviews the state of BCS theory and experiment. The many chapters on the history and early experiments are all very clear and readily accessible to a high-energy physicist, despite containing a wealth of detail. The content continues well beyond the usual applications of BCS theory and there are extensive discussions of extensions of BCS, especially in the light of attempts to understand the new high Tc superconductors ... All 23 chapters are by outstanding physicists (including many Nobel prize-winners) and all were fascinating to read. I would highly recommend this book to anyone and everyone as a wonderful review of a powerful unifying concept that covers an enormous range of phenomena."*

**CERN Courier**

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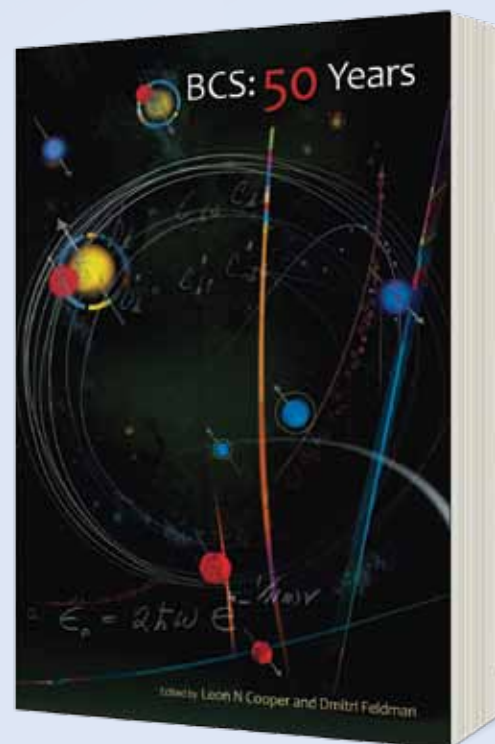
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