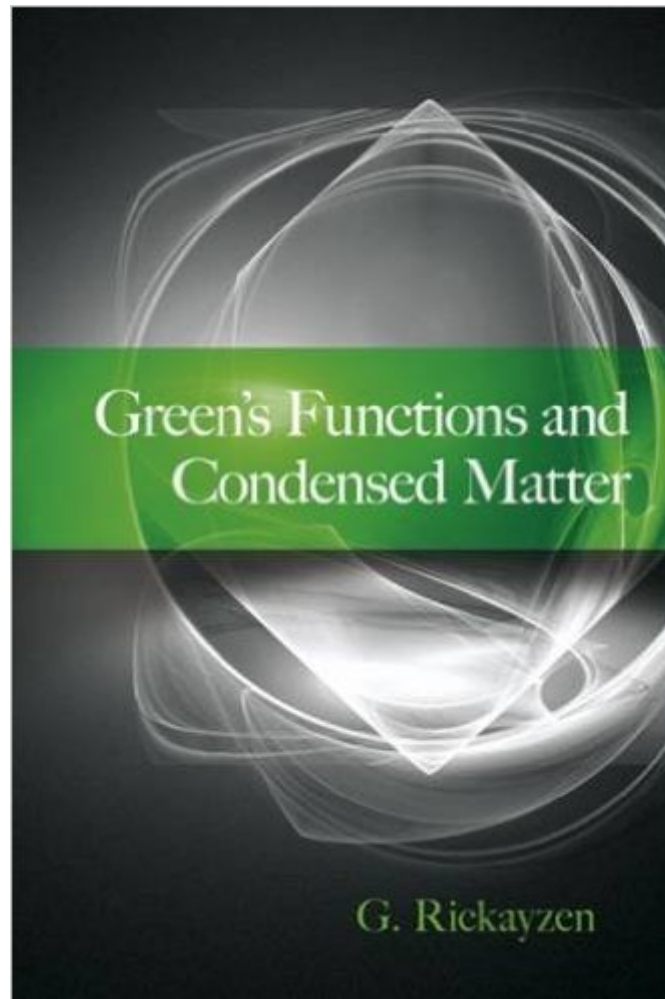


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Green's Functions And Condensed Matter (Dover Books On Physics)



Synopsis

Green's functions, named for the mathematician who developed them in the 1830s, possess applications in many areas of physics. This volume presents the basic theoretical formulation, followed by specific applications, and is suitable for advanced undergraduates, graduate students, and professionals in the area of condensed matter physics. Beginning with a description of Green's function in classical physics from a modern point of view, the text progresses to the definition and properties of Green's functions in quantum physics. Most of the book explores applications, focusing on transport coefficients of a metal, the Coulomb gas, Fermi liquids, electrons and phonons, superconductivity, superfluidity, and magnetism. The treatment assumes a good working knowledge of quantum mechanics and a familiarity with the occupation number representation. An appendix provides the main formulas and the correspondence with wave mechanics. Each chapter concludes with references and problems for further study.

Book Information

Series: Dover Books on Physics

Paperback: 368 pages

Publisher: Dover Publications; Reprint edition (May 22, 2013)

Language: English

ISBN-10: 0486499847

ISBN-13: 978-0486499840

Product Dimensions: 5.9 x 0.9 x 8.9 inches

Shipping Weight: 1.2 pounds (View shipping rates and policies)

Average Customer Review: 4.5 out of 5 stars Â Â See all reviews Â (2 customer reviews)

Best Sellers Rank: #976,549 in Books (See Top 100 in Books) #317 in Â Books > Science & Math > Physics > Solid-State Physics #680 in Â Books > Science & Math > Physics > Electromagnetism #229485 in Â Books > Reference

Customer Reviews

I am thrilled to see this book being re-printed. This is a graduate level textbook suitable for students with a background in undergraduate QM, solids, stat mech. What makes this book different from say, AGD or Fetter/Walecka (which are both fine texts), is that towards the later part of the book there are more actual applications. The superconductivity chapter is particularly good and I like the metal-transport one as well. Since most people who are going to read this intend on doing research, you might want to pair it with another modern book since it does not include path integrals. I have a

combination of this, bruus flensberg, negele/orland or atland/simons, and AGD floating around the office at most times.

In order to find this book useful, the reader needs much more than a background equivalent to graduate level courses in solid state physics and an acquaintance with Green's functions, he also needs a knowledge of quantum field theory (QTF) at the level of Ryder's Quantum Field Theory. Feynman diagrams abound in this volume, and the reader needs to be quite familiar with them in order to understand this treatment. For the reader with an adequate knowledge of QTF, however, this book is quite useful. The discussion of the BCS (Bardeen-Cooper-Schrieffer) theory of superconductivity in solids is especially good.

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