

Green's Functions and Condensed Matter

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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.

Dover (2013) republication of the 1984 corrected edition of the work originally published in 1980 by Academic Press Limited, London.



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\$24.95 USA

ISBN-13: 978-0-486-49984-0

ISBN-10: 0-486-49984-7



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