DESCRIPTION

Knowledge of the excitation characteristics of matter is decisive for the descriptions of a variety of dynamical processes, which are of significant technological interest. E.g. transport properties and the optical response are controlled by the excitation spectrum.

This self-contained work is a coherent presentation of the quantum theory of correlated few-particle excitations in electronic systems. It begins with a compact resume of the quantum mechanics of single particle excitations. Particular emphasis is put on Green function methods, which offer a natural tool to unravel the relations between the physics of small and large electronic systems. The book contains explicit expressions for the Coulomb Green function of two charge particles and a generalization to three-body systems. Techniques for the many-body Green function of finite systems are introduced and some explicit calculations of the Green functions are given. Concrete examples are provided and the theories are contrasted with experimental data, when available.

The second volume presents an up-to-date selection of applications of the developed concepts and a comparison with available experiments is made.

ABOUT THE AUTHOR

Jamal Berakdar is an outstanding young researcher who has accomplished in less than ten years remarkable contributions to the field. He is well acknowledged by the scientific community.
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