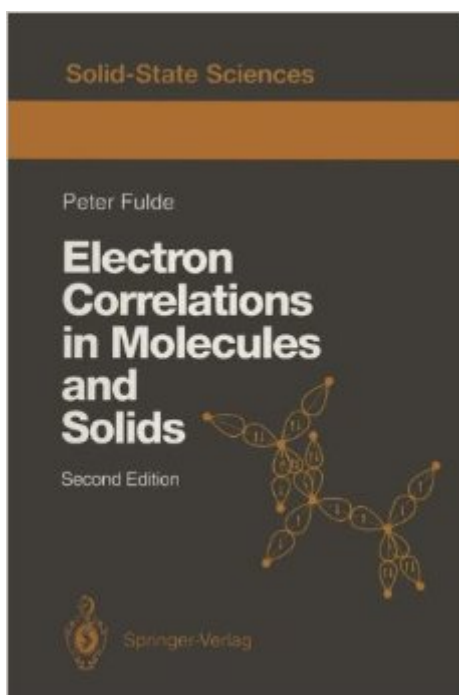# Electron Correlations In Molecules And Solids (Springer Series In Solid-State Sciences)

Synopsis

This volume bridges the gap between quantum chemistry and solid-state theory. The text develops new concepts for treating many-body and correlation effects, and deals with applications of the theory to molecules, semiconductors, transition metals, heavy-fermion systems, and the new high-Tc superconducting materials.

Book Information

Series: Springer Series in Solid-State Sciences (Book 100)

Paperback: 436 pages

Publisher: Springer; 2nd edition (January 1, 1993)

Language: English

ISBN-10: 3540563768

ISBN-13: 978-3540563761

Product Dimensions: 6.1 x 1 x 9.2 inches

Shipping Weight: 1.4 pounds (View shipping rates and policies)

Average Customer Review: 3.0 out of 5 stars See all reviews (2 customer reviews)

Best Sellers Rank: #847,946 in Books (See Top 100 in Books)   #44 in Books > Engineering & Transportation > Engineering > Electrical & Electronics > Superconductivity   #259 in Books > Science & Math > Physics > Solid-State Physics   #576 in Books > Science & Math > Chemistry > Physical & Theoretical

Customer Reviews

Think! before writing a review and confusing people about cumulants, as the previous reviewer does.Cumulants are widely used in physics and more recently also in theoretical chemistry. Their algebra is very simple, although a bit unfamiliar. Obviously, the "reviewer" Alan Mason from Round Rock, Texas has not understood that algebra. Take his first example: he is certainly right that with his choice of A one finds $\tilde{A}$ Â c. It is also true, (not pointed out by him) that c $\tilde{A}$ Â c=0 where 1op is the unit operator. But so what! These are well known consequences of the cumulant algebra but they do not imply that any of the equations in the book are wrong. Certainly, they are not. Mason should try to familiarize himself with the Grassmann algebra which is also not a standard one. He should be even more startled. But he would fail by concluding from his surprises that "This king has no clothes".

Professor Fulde's primary purpose in this advanced monograph, as stated in the preface, is to

provide a unified treatment of electron correlations in molecules and in "solids"; by the latter, he means materials such as metals in which the electrons are not well localized. The basic idea is that since the electron correlation hole is a local object, it should be possible to develop a theory that applies equally well to electron correlations in both cases.First, let us say what is meant by electron correlation. One starts with a Hamiltonian H that describes an atomic system, say, with n electrons; H acts on a Hilbert space S. Pick a finite-dimensional subspace S_0 and apply a variational principle to minimize the expectation E = over all wavefunctions Φ expressible as a single Slater determinant of n single-electron wavefunctions ϕ_i, 1

Electron Correlations in Molecules and Solids (Springer Series in Solid-State Sciences) Transmission Electron Microscopy: Physics of Image Formation (Springer Series in Optical Sciences) Typical Electron Microscope Investigations (Monographs in Practical Electron Microscopy in Materials Sci) D. B. Williams's C. Barry Carter's Transmission Electron Microscopy 2nd(Second) edition (Transmission Electron Microscopy: A Textbook for Materials Science [Hardcover])(2009) Electron Diffraction in the Transmission Electron Microscope (Microscopy Handbooks) Electromagnetic and Optical Pulse Propagation 1: Spectral Representations in Temporally Dispersive Media (Springer Series in Optical Sciences) (v. 1) Introduction to Microelectronic Fabrication: Volume 5 of Modular Series on Solid State Devices (2nd Edition) Solid State Physics for Engineering and Materials Science Conductors, Semiconductors, Superconductors: An Introduction to Solid State Physics (Undergraduate Lecture Notes in Physics) F is for First State: A Delaware Alphabet (Discover America State by State) G is for Garden State: A New Jersey Alphabet (Discover America State by State) M is for Mountain State: A West Virginia Alphabet (Discover America State by State) Environment Learning for Indoor Mobile Robots: A Stochastic State Estimation Approach to Simultaneous Localization and Map Building (Springer Tracts in Advanced Robotics) College Mathematics for Business, Economics, Life Sciences, and Social Sciences (13th Edition) College Mathematics for Business, Economics, Life Sciences and Social Sciences (12th Edition) (Barnett) Finite Mathematics for Business, Economics, Life Sciences and Social Sciences (12th Edition) (Barnett) Burton's Microbiology for the Health Sciences (Microbiology for the Health Sciences (Burton)) Thermal Properties of Solids at Room and Cryogenic Temperatures (International Cryogenics Monograph Series) Clinical Chemistry: Principles, Techniques, and Correlations Crowley's An Introduction To Human Disease: Pathology and Pathophysiology Correlations