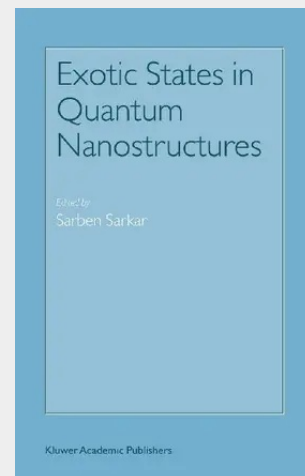


Exotic States in Quantum Nanostructures

Mesoscopic physics has made great strides in the last few years. It is an area of research that is attractive to many graduate students of theoretical condensed matter physics. The techniques that are needed to understand it go beyond the conventional perturbative approaches that still form the bulk of the graduate lectures that are given to students. Even when the non-perturbative techniques are presented, they often are presented within an abstract context. It is important to have lectures given by experts in the field, which present both theory and experiment in an illuminating and inspiring way, so that the impact of new methodology on novel physics is clear. It is an apt time to have such a volume since the field has reached a level of maturity. The pedagogical nature of the articles and the variety of topics makes it an important resource for newcomers to the field. The topics range from the newly emerging area of quantum computers and quantum information using Josephson junctions to the formal mathematical methods of conformal field theory which are applied to the understanding of Luttinger liquids.

Electrons which interact strongly can give rise to non-trivial ground states such as superconductivity, quantum Hall states and magnetism. Both their theory and application are discussed in a pedagogical way for quantum information in mesoscopic superconducting devices, skyrmions and magnetism in two dimensional electron gases, transport in quantum wires, metal-insulator transitions and spin electronics.

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