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Nota di contenuto	Theory of dense hydrogen: Proton pairing -- Quantum dots -- On the electronic properties of quantum dots -- Quantum single electron transistor -- At the limit of device miniaturization -- Classical and quantum transport calculations for elastically scattered free electron gases in 2D nanostructures when B=0 -- Kinetic confinement of electrons in modulated semiconductor structures -- The scaling theory of the integer quantum hall effect -- Single particle versus collective electronic excitations -- Review of the physics of high-temperature superconductors -- Charge dynamics in cuprate superconductors -- Coherent precession and spin superfluidity in <sup>3</sup> He -- Diamagnetic domains in beryllium as seen by muon spin rotation spectroscopy -- Growth instabilities in M.B.E. -- Scaling behaviour in submonolayer film growth — Beyond mean field theory -- Low-dimensional correlated particle systems: Exact results for groundstate and thermodynamic

quantities -- Critical behavior of weakly-disordered anisotropic systems in two dimensions -- Critical behaviour in non-integer dimension -- The Peierls instability and the flux phase problem -- Fully and partially dressed states in quantum field theory and in solid state physics -- Density functional theory and density matrices -- Dissipative quantum mechanics. Metriplectic dynamics in action -- Quantum analysis and exponential product formulas -- Coherent anomaly method and its applications to critical phenomena.

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Sommario/riassunto

The book covers the broad field of solid-state physics from the dense phases of hydrogen, through low-dimensional solids, quantum dots and nanostructures to superconductors. It provides a professional overview of solid-state physics as a real bridge between quantum mechanics and the latest technological achievements.

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