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Sommario/riassunto	This volume contains the revised and completed notes of lectures given at the school "Quantum Potential Theory: Structure and Applications to Physics," held at the Alfried-Krupp-Wissenschaftskolleg in Greifswald from February 26 to March 10, 2007. Quantum potential theory studies noncommutative (or quantum) analogs of classical potential theory. These lectures provide an introduction to this theory, concentrating on probabilistic potential theory and it quantum analogs, i.e. quantum Markov processes and semigroups, quantum random walks, Dirichlet forms on C* and von Neumann algebras, and boundary theory. Applications to quantum physics, in particular the filtering problem in quantum optics, are also presented.