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Nota di contenuto	Part I Why a Theory of Electronic States in Crystals of Finite Size is Needed -- Introduction -- Part II One-Dimensional Semi-infinite Crystals and Finite Crystals -- The Periodic Sturm-Liouville Equations -- Surface States in One-Dimensional Semi-infinite Crystals -- Electronic States in Ideal One-Dimensional Crystals of Finite Length -- Part III Low-Dimensional Systems and Finite Crystals -- Electronic States in Ideal Quantum Films -- Electronic States in Ideal Quantum Wires -- Electronic States in Ideal Finite Crystals or Quantum Dots -- Part IV Epilogue -- Concluding Remarks -- Appendices.
Sommario/riassunto	This book presents an analytical theory of the electronic states in ideal

low dimensional systems and finite crystals based on a differential equation theory approach. It provides precise and fundamental understandings on the electronic states in ideal low-dimensional systems and finite crystals, and offers new insights into some of the basic problems in low-dimensional systems, such as the surface states and quantum confinement effects, etc., some of which are quite different from what is traditionally believed in the solid state physics community. Many previous predictions have been confirmed in subsequent investigations by other authors on various relevant problems. In this new edition, the theory is further extended to one-dimensional photonic crystals and phononic crystals, and a general theoretical formalism for investigating the existence and properties of surface states/modes in semi-infinite one-dimensional crystals is developed. In addition, there are various revisions and improvements, including using the Kronig-Penney model to illustrate the analytical theory and make it easier to understand. This book is a valuable resource for solid-state physicists and material scientists.