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Autore	Rakityansky Sergei A.
Titolo	Jost Functions in Quantum Mechanics : A Unified Approach to Scattering, Bound, and Resonant State Problems / / by Sergei A. Rakityansky
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Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Chapter 1: The Basic Concepts -- Part I: Single-Channel Problems -- Chapter 2: Schr¨Odinger Equation and its Solutions -- Chapter 3: Riemann Surface and the Spectral Points -- Chapter 4: Scattering States and the S-Matrix -- Chapter 5: Complex Angular Momentum -- Chapter 6: Green's Functions -- Chapter 7: Short-Range Potential Extending to Infinity -- Chapter 8: Single-Channel Potential with Coulombic Tail -- Part II: Multi-Channel Problems -- Chapter 9: Non-Central Potential -- Chapter 10: Systems with Non-Zero Spin -- Chapter 11: Multi-Channel Schr Odinger Equation -- Chapter 12: Multi-Channel Jost Matrix -- Chapter 13: Riemann Surfaces for Multi-Channel Systems -- Chapter 14: Multi-Channel Problems of Charged Particles -- Chapter 15: Effective-Range Expansion and its Generalizations -- Part III: Special Issues -- Chapter 16: Singular and Low-Dimensional Potentials -- Chapter 17: Miscellaneous Extensions

	of the Jost Function Approach -- Chapter 18: Some Exactly Solvable Potential Models -- Appendices -- References and Index.
Sommario/riassunto	Based on Jost function theory this book presents an approach useful for different types of quantum mechanical problems. These include the description of scattering, bound, and resonant states, in a unified way. The reader finds here all that is known about Jost functions as well as what is needed to fill the gap between the pure mathematical theory and numerical calculations. Some of the topics covered are: quantum resonances, Regge poles, multichannel scattering, Coulomb interaction, Riemann surfaces, multichannel analog of the effective range theory, one- and two-dimensional problems, many-body problems within the hyperspherical approach, just to mention few of them. These topics are relevant in the fields of quantum few-body theory, nuclear reactions, atomic collisions, and low-dimensional semiconductor nanostructures. In light of this, the book is meant for students, who study quantum mechanics, scattering theory, or nuclear reactions at the advanced level as well as for post-graduate students and researchers in the fields of nuclear and atomic physics. Many of the arguments that are traditional for textbooks on quantum mechanics and scattering theory, are covered here in a different way, using the Jost functions. This gives the reader a new insight into the subject, revealing new features of various mathematical objects and quantum phenomena.