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Autore	Veliev Oktay
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Soggetti	Mathematical physics Quantum theory Condensed matter Optics Theoretical, Mathematical and Computational Physics Quantum Physics Mathematical Methods in Physics Condensed Matter Physics Optics and Photonics
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Nota di contenuto	1.Introduction and Overview -- 2.Spectral Theory for the Schrödinger Operator with a ComplexValued Periodic Potential -- 3.On the Special Potentials -- 4.On the Mathieu-Schrödinger Operator -- 5.PT-Symmetric Periodic Optical Potential -- 6.On the Schrödinger Operator with a Periodic Matrix Potential -- 7.Some Generalizations and Supplements.
Sommario/riassunto	This book offers a comprehensive exploration of spectral theory for non-self-adjoint differential operators with complex-valued periodic coefficients, addressing one of the most challenging problems in mathematical physics and quantum mechanics: constructing spectral expansions in the absence of a general spectral theorem. It examines scalar and vector Schrödinger operators, including those with PT-

symmetric periodic optical potentials, and extends these methodologies to higher-order operators with periodic matrix coefficients. The second edition significantly expands upon the first by introducing two new chapters that provide a complete description of the spectral theory of non-self-adjoint differential operators with periodic coefficients. The first of these new chapters focuses on the vector case, offering a detailed analysis of the spectral theory of non-self-adjoint Schrödinger operators with periodic matrix potentials. It thoroughly examines eigenvalues, eigenfunctions, and spectral expansions for systems of one-dimensional Schrödinger operators. The second chapter develops a comprehensive spectral theory for all ordinary differential operators, including higher-order and vector cases, with periodic coefficients. It also includes a complete classification of the spectrum for PT-symmetric periodic differential operators, making this edition the most comprehensive treatment of these topics to date. The book begins with foundational topics, including spectral theory for Schrödinger operators with complex-valued periodic potentials, and systematically advances to specialized cases such as the Mathieu–Schrödinger operator and PT-symmetric periodic systems. By progressively increasing the complexity, it provides a unified and accessible framework for students and researchers. The approaches developed here open new horizons for spectral analysis, particularly in the context of optics, quantum mechanics, and mathematical physics.
