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Nota di contenuto	Chapter 1. Continuous, Discrete and Ultradiscrete Painlevé Equations -- Chapter 2. Elliptic Hypergeometric Functions -- Chapter 3. Integrability of Difference Equations through Algebraic Entropy and Generalized Symmetries -- Chapter 4. Introduction to Linear and Nonlinear Integrable Theories in Discrete Complex Analysis -- Chapter 5. Discrete Integrable Systems, Darboux Transformations and Yang–Baxter Maps -- Chapter 6. Symmetry-Preserving Numerical Schemes -- Chapter 7. Introduction to Cluster Algebras -- Chapter 8. An Introduction to Difference Galois Theory -- Chapter 9. Lectures on Quantum Integrability: Lattices, Symmetries and Physics.
Sommario/riassunto	This book shows how Lie group and integrability techniques, originally developed for differential equations, have been adapted to the case of difference equations. Difference equations are playing an increasingly important role in the natural sciences. Indeed, many phenomena are

inherently discrete and thus naturally described by difference equations. More fundamentally, in subatomic physics, space-time may actually be discrete. Differential equations would then just be approximations of more basic discrete ones. Moreover, when using differential equations to analyze continuous processes, it is often necessary to resort to numerical methods. This always involves a discretization of the differential equations involved, thus replacing them by difference ones. Each of the nine peer-reviewed chapters in this volume serves as a self-contained treatment of a topic, containing introductory material as well as the latest research results and exercises. Each chapter is presented by one or more early career researchers in the specific field of their expertise and, in turn, written for early career researchers. As a survey of the current state of the art, this book will serve as a valuable reference and is particularly well suited as an introduction to the field of symmetries and integrability of difference equations. Therefore, the book will be welcomed by advanced undergraduate and graduate students as well as by more advanced researchers.