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Titolo	Direct and Inverse Methods in Nonlinear Evolution Equations : Lectures Given at the C.I.M.E. Summer School Held in Cetraro, Italy, September 5–12, 1999 / / by Robert M. Conte, Franco Magri, Micheline Musette, Junkichi Satsuma, Pavel Winternitz ; edited by Antonio Maria Greco
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Nota di contenuto	Exact Solutions of Nonlinear Partial Differential Equations by Singularity Analysis -- The Method of Poisson Pairs in the Theory of Nonlinear PDEs -- Nonlinear Superposition Formulae of Integrable Partial Differential Equations by the Singular Manifold Method -- Hirota Bilinear Method for Nonlinear Evolution Equations -- Lie Groups, Singularities and Solutions of Nonlinear Partial Differential Equations.
Sommario/riassunto	Many physical phenomena are described by nonlinear evolution equation. Those that are integrable provide various mathematical methods, presented by experts in this tutorial book, to find special analytic solutions to both integrable and partially integrable equations. The direct method to build solutions includes the analysis of singularities à la Painlevé, Lie symmetries leaving the equation

invariant, extension of the Hirota method, construction of the nonlinear superposition formula. The main inverse method described here relies on the bi-hamiltonian structure of integrable equations. The book also presents some extension to equations with discrete independent and dependent variables. The different chapters face from different points of view the theory of exact solutions and of the complete integrability of nonlinear evolution equations. Several examples and applications to concrete problems allow the reader to experience directly the power of the different machineries involved.