Zbl 1111.37001

Faddeev, Ludwig D.; Takhtajan, Leon A. (Takhtadzhyan, Leon A.)
Hamiltonian methods in the theory of solitons. Transl. from the Russian by A. G. Reyman. Reprint of the 1987 original. (English)
Classics in Mathematics. Berlin: Springer. xiv, 592 p. EUR 39.95/net; SFR 65.50; $ 59.95; £ 30.50 (2007). ISBN 978-3-540-69843-2/pbk

This is a reprint of the original 1987 edition (see Zbl 0632.58004). The Russian original was reviewed in Zbl 0632.58003.
This fantastic book definitely deserves to be included in Springer's Classics in Mathematics series as it represents a milestone in dynamical systems literature.
For convenience of the readers who are not aware of this book yet, we give the table of contents:
Part I. Nonlinear Schrödinger equation. Chapter 1. Representation of zero curvature. Chapter 2. Riemann problem. Chapter 3. Hamiltonian formulation.
Part II. General theory of integrable evolution equations. Chapter 1. Main examples and their general properties. Chapter 2. Fundamental continuous models. Chapter 3. Fundamental models on a lattice. Chapter 4. Lie-algebraic approach to the classification and investigation of integrable models.

Olaf Ninnemann (Berlin)
Keywords : Hamiltonian systems; inverse scattering; nonlinear Schrödinger equation; sine-Gordon equation; Heisenberg equation; Toda lattice; Riemann problem; evolution equations; integrable models
Classification :
    ∗37-02 Research exposition (Dynamical systems and ergodic theory)
    37K15 Integration by inverse spectral and scattering methods
    37K40 Soliton theory, asymptotic behavior of solutions
    37K60 Lattice dynamics
    37J35 Completely integrable systems, etc.
    37K10 Completely integrable systems etc.
    37K30 Relations with algebraic structures
    81U40 Inverse scattering problems (quantum theory)
    81Q05 Closed and approximate solutions to quantum-mechanical equations
    58J50 Spectral problems; spectral geometry; scattering theory
    35Q51 Solitons
    35Q55 NLS-like (nonlinear Schroedinger) equations
    35Q58 Other completely integrable PDE