

1. Record Nr.	UNINA9910146554103321
Titolo	The fermi-pasta-ulam problem : a status report // edited by G. Gallavotti
Pubbl/distr/stampa	Berlin, Germany ; ; New York, United States : , : Springer, , [2008] ©2008
ISBN	3-540-72995-X
Edizione	[1st ed. 2008.]
Descrizione fisica	1 online resource (VII, 301 p.)
Collana	Lecture notes in physics ; ; 728
Disciplina	003.857
Soggetti	Chaotic behavior in systems - Mathematical models Nonlinear theories Dynamics
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Bibliographic Level Mode of Issuance: Monograph
Nota di bibliografia	Includes bibliographical references.
Nota di contenuto	to FPU -- Dynamics of Oscillator Chains -- Role of Chaos for the Validity of Statistical Mechanics Laws: Diffusion and Conduction -- The Fermi—Pasta—Ulam Problem and the Metastability Perspective -- Resonance, Metastability and Blow up in FPU -- Center Manifold Theory in the Context of Infinite One-Dimensional Lattices -- Numerical Methods and Results in the FPU Problem -- An Integrable Approximation for the Fermi—Pasta—Ulam Lattice.
Sommario/riassunto	The apparent contradiction of the results of the Fermi-Pasta-Ulam experiment conducted in 1953 and 1954 with the hypothesis that essentially any nonlinearity would lead to a system exhibiting ergodic behaviour has become known as the Fermi-Pasta-Ulam Problem. This volume reviews the current understanding of this paradox without trying to force coherence on differing perspectives on the same problem by various groups or approaches. The contributions comprise studies of one-dimensional chains, descriptions of numerical methods, heuristic theories, addressing the "long standing and controversial problem of distinguishing chaos from noise in signal analysis," metastability, the relation of the FPU motions with the integrable equations, approaches using methods of perturbation theory and the proof of the applicability of KAM theory in FPU chains with energy very

close to a minimum. For the convenience of the reader the original work of FPU is reprinted in an appendix. The order of the contributions reflects the aim of leading the interested but inexperienced reader through gradual understanding, starting from general analysis, and proceeding towards more specialized topics.
