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Titolo	Biological Evolution and Statistical Physics / / edited by M. Lässig, A. Valleriani
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ISBN	3-540-45692-9
Edizione	[1st ed. 2002.]
Descrizione fisica	1 online resource (XII, 342 p.)
Collana	Lecture Notes in Physics, , 0075-8450 ; ; 585
Disciplina	576.8
Soggetti	Evolution (Biology) Statistical physics Dynamics Biophysics Bioinformatics Biomathematics Evolutionary Biology Complex Systems Biological and Medical Physics, Biophysics Mathematical and Computational Biology Statistical Physics and Dynamical Systems
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Based on papers from a workshop held in Dresden, Germany in 2000.
Nota di bibliografia	Includes bibliographical references.
Nota di contenuto	Molecular information and evolution -- Statistical significance and extremal ensemble of gapped local hybrid alignment -- On the design of optimization criteria for multiple sequence alignment -- Red queen dynamics and the evolution of translational redundancy and degeneracy -- A testable genotype-phenotype map: modeling evolution of RNA molecules -- Evolutionary perspectives on protein structure, stability, and functionality -- Phylogeny -- The statistical approach to molecular phylogeny: Evidence for a nonhyperthermophilic common ancestor -- Principles of cophylogenetic maps -- Accounting for phylogenetic uncertainty in comparative studies of evolution and adaptation -- The 'shape' of phylogenies under simple random speciation models -- The evolution of populations and species -- Fitness landscapes -- Tempo

and mode in quasispecies evolution -- Multilevel processes in evolution and development: Computational models and biological insights -- Evolutionary strategies for solving optimization problems -- Review of biological ageing on the computer -- Spatio-temporal modes of speciation -- Large-scale evolution -- Food web structure and the evolution of ecological communities -- Dynamics and topology of species networks -- Modelling macroevolutionary patterns: An ecological perspective.

Sommario/riassunto

This set of lecture notes gives a first coherent account of a novel aspect of the living world that can be called biological information. The book presents both a pedagogical and state-of-the art roadmap of this rapidly evolving area and covers the whole field, from information which is encoded in the molecular genetic code to the description of large-scale evolution of complex species networks. The book will prove useful for all those who work at the interface of biology, physics and information science.