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Titolo	A Perspective Look at Nonlinear Media [[electronic resource] ] : From Physics to Biology and Social Sciences / / edited by Jürgen Parisi, Stefan C. Müller, Walter Zimmermann
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Disciplina	530.1/55252
Soggetti	Condensed matter Physical measurements Measurement Biochemistry Immunology Physical chemistry Condensed Matter Physics Measurement Science and Instrumentation Biochemistry, general Physical Chemistry
Lingua di pubblicazione	Inglese
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Nota di contenuto	Quantum chaos in Rydberg atoms -- Crystallization of electrons and holes -- Natural patterns in nonequilibrium systems -- Linear aspects of the Faraday instability -- On curved cellular flames -- Nonlinear flow behavior and shear-induced structure of fluids -- Experimental study of horizontally shaken granular matter — The swelling effect -- On relaxational granular compaction -- From microscopic to macroscopic traffic models -- The modelling concept of sociodynamics -- The morphogenesis of dictyostelium discoideum — Pattern formation in a biological excitable system -- Path optimization in chemical and biological systems on the basis of excitation waves -- BSE viewed dynamically: A possible early cure based on passive immunization against PrPSc -- Molecular semiotic structures in the cellular immune

system: Key to dynamics and spatial patterning? -- Molecular evolutionary dynamics -- The retinal spreading depression: A model for nonlinear behavior of the brain -- An analytically solvable model of collective excitation patterns in cortical tissue -- Interaction of meandering spiral waves in active media -- Spatiotemporal patterns in a passivating electrochemical system -- Instabilities of pollutant concentrations in the troposphere due to chemical reactions -- Hydrodynamic singularities -- Disordered structures analyzed by the theory of Markov processes -- Transition to turbulence in shear flows -- Deformation of charge density waves in quasi-one-dimensional semiconductors visualized by scanning electron microscopy -- Probing nonlinear carrier transport in semi- and superconductors via low-temperature scanning laser microscopy -- Nonlinear spatio-temporal emission dynamics of broad area laser diodes -- Gravitational slowing down of clocks implies proportional size increase.

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#### Sommario/riassunto

Concepts of nonlinear physics are applied to an increasing number of research disciplines. With this volume, the editors offer a selection of articles on nonlinear topics in progress, ranging from physics and chemistry to biology and some applications of social science. The book covers quantum optics, electron crystallization, cellular or flow patterns in fluids and in granular media, biological systems, and the control of brain structures via neuronal excitation. Chemical patterns are looked at both in bulk solutions and on surfaces in heterogeneous systems. From regular structures, the authors turn to the more complex behavior in biology and physics, such as hydrodynamical turbulence, low-dimensional dynamics in solid-state physics, and gravity.

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