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Titolo	Control of Self-Organizing Nonlinear Systems // edited by Eckehard Schöll, Sabine H. L. Klapp, Philipp Hövel
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ISBN	3-319-28028-7
Edizione	[1st ed. 2016.]
Descrizione fisica	1 online resource (XVII, 475 p. 159 illus., 42 illus. in color.)
Collana	Understanding Complex Systems, , 1860-0832
Disciplina	530
Soggetti	Statistical physics Dynamical systems Amorphous substances Complex fluids Systems biology Biological systems Physics System theory Complex Systems Soft and Granular Matter, Complex Fluids and Microfluidics Systems Biology Mathematical Methods in Physics Statistical Physics and Dynamical Systems
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Bibliographic Level Mode of Issuance: Monograph
Nota di contenuto	Controlling chimera patterns in networks: Interplay of structure, noise, and delay -- Emergence of clusters of locked and whirling oscillators in the Kuramoto model with Inertia -- Control of synchronization in delay-coupled networks -- Controlling oscillations in nonlinear systems with delayed output feedback -- Global effects of delayed feedback control applied to the Lorenz system -- Spatio-temporal patterns: observation, control, and design -- On the interplay of noise and delay in coupled oscillators -- Noisy dynamical systems with time delay: some basic analytical perturbation schemes with applications --

Study on critical conditions and transient behaviors in noise-induced bifurcation -- Analytical, optimal and sparse optimal control of the FitzHugh-Nagumo and Schlögl model -- Recent advances in reaction-diffusion equations with non-ideal relays -- Deriving effective models for multiscale systems via evolutionary Gamma convergence -- Moment closure - A brief review -- Feedback control in quantum transport -- Controlling the stability of steady states in continuous variable quantum systems -- Quantum signatures of chimera states -- Controlled switching between time-periodic square-waves in photonic devices -- Exploiting multistabilities to achieve stable chimera states in all-to-all coupled laser networks -- Feedback control of colloidal transport -- Swarming of self-propelled particles on the surface of a dewetting liquid film -- Time-delayed feedback control of spatio-temporal self-organized patterns in dissipative systems -- Control of epidemics on hospital network -- Intrinsic control mechanisms of neuronal network dynamics -- Oscillations and intrinsic fluctuations in evolutionary dynamics: how payoffs, dynamics and population sizes control the stability, and implementation of global feedback.

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### Sommario/riassunto

The book summarizes the state-of-the-art of research on control of self-organizing nonlinear systems with contributions from leading international experts in the field. The first focus concerns recent methodological developments including control of networks and of noisy and time-delayed systems. As a second focus, the book features emerging concepts of application including control of quantum systems, soft condensed matter, and biological systems. Special topics reflecting the active research in the field are the analysis and control of chimera states in classical networks and in quantum systems, the mathematical treatment of multiscale systems, the control of colloidal and quantum transport, the control of epidemics and of neural network dynamics.

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