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ISBN	1-280-94951-1 9786610949519 3-540-46277-5
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Descrizione fisica	1 online resource (253 p.)
Collana	Understanding complex systems
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Nota di bibliografia	Includes bibliographical references (pages [217]-238) and index.
Nota di contenuto	Introduction: Physics and Cybernetics -- Subject and Methodology of Cybernetical Physics -- Control of Conservative Systems -- Control of Dissipative Systems -- Controlled Synchronization -- Control of Chaos -- Control of Interconnected and Distributed Systems -- Control of Molecular and Quantum Systems -- Control Algorithms and Dynamics of Physical Systems -- Examples -- Conclusions: Looking into the Future.
Sommario/riassunto	The control of complex systems is one of the most important aspects in dealing with systems exhibiting nonlinear behaviour or similar features that defy traditional control techniques. This specific subject is gradually becoming known as cybernetical physics, borrowing methods from both theoretical physics and control engineering. This book is, perhaps, the first attempt to present a unified exposition of the subject and methodology of cybernetical physics as well as solutions to some of its problems. Emphasis of the book is on the examination of fundamental limits on energy transformation by means of control procedures in both conservative and dissipative systems. A survey of application in physics includes the control of chaos, synchronisation of coupled oscillators, pendulum chains, reactions in physical chemistry

and of quantum systems such as the dissociation of diatomic molecules. This book has been written having researchers from various backgrounds in physics, mathematics and engineering in mind and is thus also suitable as introduction to graduate students working on the understanding of a broad range of complex systems in the natural sciences.