

Meyers, Robert A. (ed.)

Encyclopedia of complexity and systems science. 11 Volumes. (English) Zbl 1171.93001
New York, NY: Springer (ISBN 978-0-387-75888-6/hbk; 978-0-387-30440-3/ebook). lxxx, 10370 p. (2009).

Publisher's description: Encyclopedia of Complexity and Systems Science provides an authoritative single source for understanding and applying the concepts of complexity theory together with the tools and measures for analyzing complex systems in all fields of science and engineering. The science and tools of complexity and systems science include theories of self-organization, complex systems, synergetics, dynamical systems, turbulence, catastrophes, instabilities, nonlinearity, stochastic processes, chaos, neural networks, cellular automata, adaptive systems, and genetic algorithms. Examples of near-term problems and major unknowns that can be approached through complexity and systems science include: The structure, history and future of the universe; the biological basis of consciousness; the integration of genomics, proteomics and bioinformatics as systems biology; human longevity limits; the limits of computing; sustainability of life on earth; predictability, dynamics and extent of earthquakes, hurricanes, tsunamis, and other natural disasters; the dynamics of turbulent flows; lasers or fluids in physics, microprocessor design; macromolecular assembly in chemistry and biophysics; brain functions in cognitive neuroscience; climate change; ecosystem management; traffic management; and business cycles. All these seemingly quite different kinds of structure formation have a number of important features and underlying structures in common. These deep structural similarities can be exploited to transfer analytical methods and understanding from one field to another. This unique work will extend the influence of complexity and system science to a much wider audience than has been possible to date.

The articles of this volume will not be indexed individually.

MSC:

- [93-00](#) General reference works (handbooks, dictionaries, bibliographies, etc.)
pertaining to systems and control theory
- [68-00](#) General reference works (handbooks, dictionaries, bibliographies, etc.)
pertaining to computer science
- [68Q80](#) Cellular automata (computational aspects)
- [93A10](#) General systems

Cited in **5** Reviews
Cited in **6** Documents

Full Text: [DOI](#)