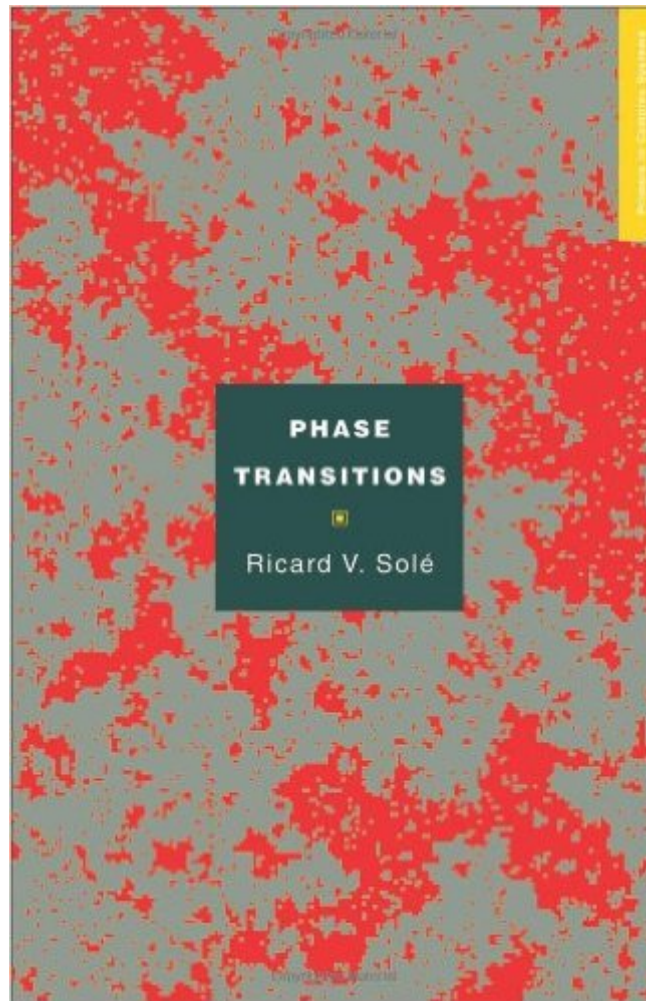The book was found

Phase Transitions (Primers In Complex Systems)

Synopsis

Phase transitions--changes between different states of organization in a complex system--have long helped to explain physics concepts, such as why water freezes into a solid or boils to become a gas. How might phase transitions shed light on important problems in biological and ecological complex systems? Exploring the origins and implications of sudden changes in nature and society, Phase Transitions examines different dynamical behaviors in a broad range of complex systems. Using a compelling set of examples, from gene networks and ant colonies to human language and the degradation of diverse ecosystems, the book illustrates the power of simple models to reveal how phase transitions occur.Introductory chapters provide the critical concepts and the simplest mathematical techniques required to study phase transitions. In a series of example-driven chapters, Ricard Solé shows how such concepts and techniques can be applied to the analysis and prediction of complex system behavior, including the origins of life, viral replication, epidemics, language evolution, and the emergence and breakdown of societies.Written at an undergraduate mathematical level, this book provides the essential theoretical tools and foundations required to develop basic models to explain collective phase transitions for a wide variety of ecosystems.

Book Information

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Customer Reviews

As an electronics engineer, I'm an "armchair scientist" -- using that term without any disrespect. In my context it means I love studying math, physics, chemistry, etc. even though my field is harmonics, and much narrower than scientists like Sole who grasp wonderful big as well as small

pictures. Recently, a number of outstanding books have come out on complexity theory and dynamical systems-- most notably the p vs. np series that includes Fortnow's excellent book: The Golden Ticket: P, NP, and the Search for the Impossible.You know the old saying that publishers who allow even a few math symbols in a text, let alone a sigma or derivative, are condemning the book to an exponential decay in sales. It thus takes a courageous or detached author to insist on not removing the "meat" of the math. Sole is such an author! While phase transitions (and boundary value problems in general) are at the heart of most field and phase work at the cutting edge of complexity theory and dynamical systems research today, very few books have been written that are accessible to the educated but non professional mathematician reader. Where the few exist, they cover only one of two applications of the research (sometimes unfortunately to "make a point") like ecology or sociology.What about physics, cancer, human language development, computer networks, ant behavior, economics, day trading, genetics, monte carlo, decision theory, neurons... ok, we can see why only ONE book (this one) attempts to survey the entire field with sufficient depth to elicit deep enjoyment and further curiosity without being $190 and 600 pages!

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