Models of Life: Dynamics and Regulation in Biological Systems

Kim Sneppen
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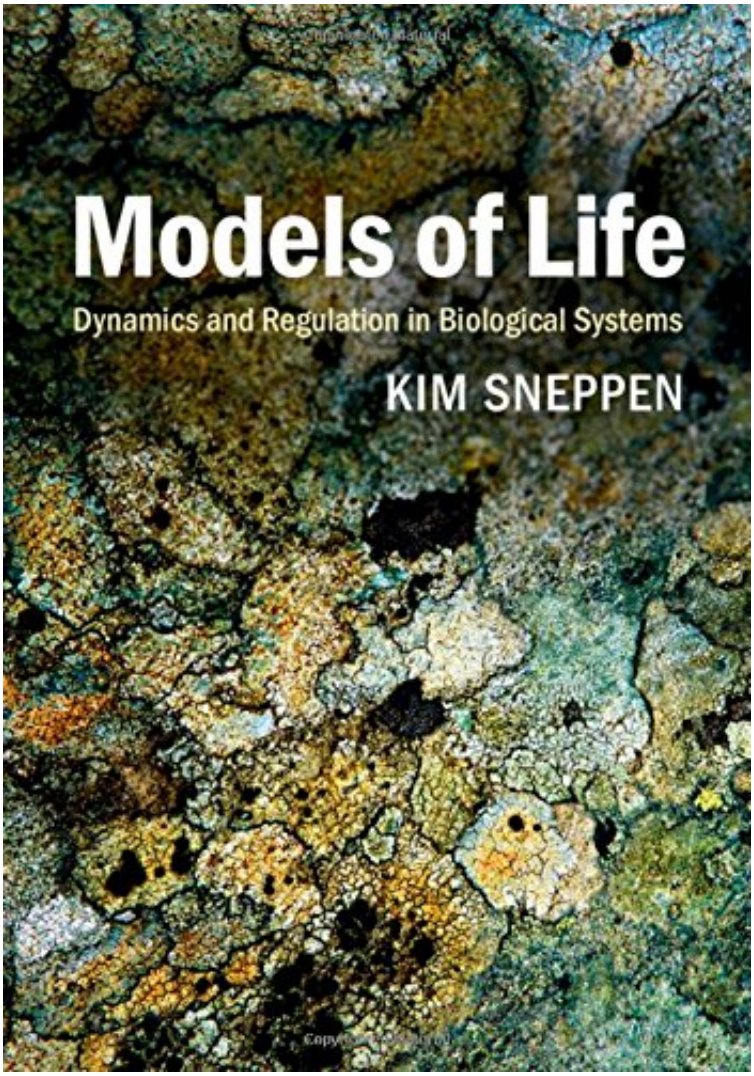

#2622601 in Books Kim Sneppen 2014-11-17Original language:EnglishPDF # 1 9.72 x .79 x 6.85l, 2.10 #File Name: 1107061903350 pagesModels of Life Dynamics and Regulation in Biological Systems | File size: 46.Mb

Kim Sneppen : Models of Life: Dynamics and Regulation in Biological Systems before purchasing it in order to gage whether or not it would be worth my time, and all praised Models of Life: Dynamics and Regulation in Biological Systems:

0 of 0 people found the following review helpful. A terrific introduction to the physics of dynamic cellular processesBy Michael InsanaA terrific introduction to the physics of dynamic cellular processes. The book is especially helpful to experienced scientists trying to figure out what the fast-evolving science of quantitative biology is all about.0 of 0 people found the following review helpful. Excellent textbook and tutorial on simple models of complex

biological systemsBy Sergei MaslovThis insightful book is written by a recognized expert in the field of biological modeling and the director of the eponymous center at the Niels Bohr Institute, University of Copenhagen. Author's modeling philosophy is that one can learn a lot about complex biological systems by studying their simplified models. Different chapters of this book, unified by this philosophy, are sure to be of interest to a very diverse group of readers. Topics covered include agent-based modeling and its applications to epigenetics, propagation of information, and evolutionary patterns in fossil record. Book successfully "marries" biophysical and systems biology descriptions of gene regulation, protein-protein interactions, and their networks. The book provides especially deep coverage of biology of phages, bacteria and their interactions within ecosystems. It would make an excellent textbook for one or even several university courses on systems biology, ecosystem dynamics or evolution. In fact, I will heavily use this book to prepare the courses that I will teach at the University of Illinois at Urbana Champaign. This book will also be a required reading for my students teaching them how complexity arises out of simplicity.

Reflecting the major advances that have been made in the field over the past decade, this book provides an overview of current models of biological systems. The focus is on simple quantitative models, highlighting their role in enhancing our understanding of the strategies of gene regulation and dynamics of information transfer along signalling pathways, as well as in unravelling the interplay between function and evolution. The chapters are self-contained, each describing key methods for studying the quantitative aspects of life through the use of physical models. They focus, in particular, on connecting the dynamics of proteins and DNA with strategic decisions on the larger scale of a living cell, using E. coli and phage lambda as key examples. Encompassing fields such as quantitative molecular biology, systems biology and biophysics, this book will be a valuable tool for students from both biological and physical science backgrounds.