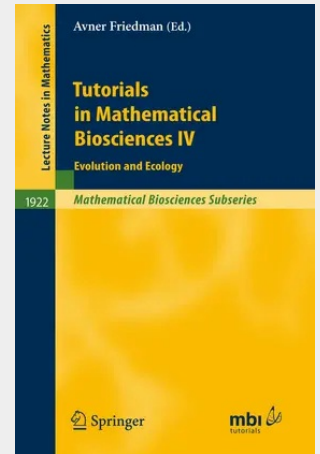


Tutorials in Mathematical Biosciences IV

Evolution and Ecology

This is the fourth volume in the series "Tutorials in Mathematical Biosciences." These lectures are based on material which was presented in tutorials or developed by visitors and postdoctoral fellows of the Mathematical Biosciences Institute (MBI), at The Ohio State University. The aim of this series is to introduce graduate students and researchers with just a little background in either mathematics or biology to mathematical modeling of biological processes. The first volume was devoted to mathematical neuroscience, which was the focus of the MBI program 2002–2003. The second volume dealt with mathematical modeling of calcium dynamics in signal transduction, the focus of the MBI program in the winter of 2004. The third volume dealt with topics of cell cycle, tumor growth, and cancer therapy; these topics featured in several workshops held at the MBI in the fall of 2003. The present volume deals with a variety of topics of evolution and ecology, which were considered in the MBI during the year 2005–2006. These topics include phylogenetics; evolution of genes through migration–selection; ecological modeling; and evolution of dispersal and population dynamics. Documentation of the 2005–2006 activities, including streaming videos of the workshops, can be found on the Web site: <http://mbi.osu.edu>. Phylogenetics is the study of the evolutionary relations of genes and organisms. Phylogenetic trees are represented by graphs in which the leaves represent observed biological entities. In constructing such graphs, one tries to trace the evolution of species, traits, or diseases. The first two chapters of this volume deal with phylogenetics.

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