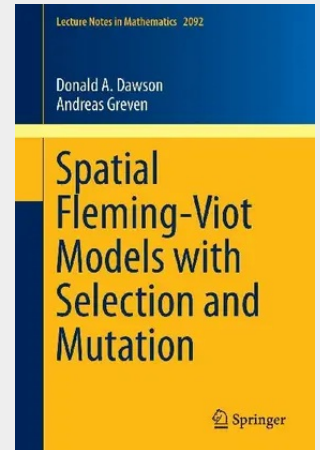


Spatial Fleming-Viot Models with Selection and Mutation

This book constructs a rigorous framework for analysing selected phenomena in evolutionary theory of populations arising due to the combined effects of migration, selection and mutation in a spatial stochastic population model, namely the evolution towards fitter and fitter types through punctuated equilibria. The discussion is based on a number of new methods, in particular multiple scale analysis, nonlinear Markov processes and their entrance laws, atomic measure-valued evolutions and new forms of duality (for state-dependent mutation and multitype selection) which are used to prove ergodic theorems in this context and are applicable for many other questions and renormalization analysis for a variety of phenomena (stasis, punctuated equilibrium, failure of naive branching approximations, biodiversity) which occur due to the combination of rare mutation, mutation, resampling, migration and selection and make it necessary to mathematically bridge the gap (in the limit) between time and space scales.

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