CIME Course on

From a Microscopic to a Macroscopic Description of Complex Systems

Będlewo (Poland) - September 4-9, 2006

Evolutionary Game Theory and Population Dynamics

Lecturer: Jacek Miękisz

Outline:

1. Introduction to evolutionary game theory
   - 1.1 Nash equilibria
   - 1.2 Evolutionarily stable strategies
   - 1.3 Replicator dynamics
2. Population dynamics with time delay
3. Stochastic models of finite populations
   - 3.1 Stationary states of Markov chains
   - 3.2 Adaptive darwinian dynamics
   - 3.3 Spatial models
4. Evolutionary genetics
   - 4.1 Hardy-Weinberg equations
   - 4.2 Game Theory meets Mendel
   - 4.3 Recombination

Reference

J. Alboszta and J. Miękisz, *Stability of evolutionarily stable strategies in discrete replicator dynamics with time delay*, J. Theor. Biol. 231: 175-179 (2004).

J. Miękisz, *Statistical mechanics of spatial evolutionary games*, J. Phys. A 37: 9891-9906 (2004).

J. Miękisz, *Stochastic stability in spatial games*, J. Stat. Phys. 117: 99-110 (2004).

J. Miękisz, *Stochastic stability in spatial three-player games*, Physica A 343: 175-184 (2004).

J. Miękisz, *Equilibrium selection in evolutionary games with random matching of players*, J. Theor. Biol. 232: 47-53 (2005).

D. Kaminski, J. Miękisz, and M. Zaborowski, *Stochastic stability in three-player games*, 1195-1205 (2005).