# Theoretical Ecology

**Organized by:** Centro de Biologia Ambiental (http://cba.fc.ul.pt/)

**Teacher**: Henrique Pereira (Ciência 2007, CBA)

**Calendar**: February 8-12, 2010

**Duration**: 30 hours

**Schedule**: 9h-12h and 14h-17h, everyday
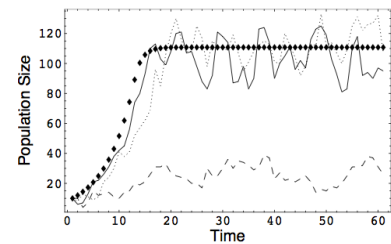
**Objectives**: This class introduces the student to the field of theoretical ecology. It aims at providing the student with a basic toolbox of models that are used in behavioral ecology, population ecology, and ecosystem ecology. This class will have a strong computer lab component.

**General Plan** (30 hours):
Introduction to R and Mathematica (3 hours)
Models in Behavioral Ecology: Game Theory in Animal Conflict and Negotiation, Evolutionary Stable Strategies, Ideal Free Distribution, Optimality, Emergent Dynamics and Cellular Automata (5 hours)
Models in Population Ecology: Population Viability Analysis (Individual-Based Models versus Mathematical Models), Demographic Stochasticity, Environmental Stochasticity, Age Classified Models, Spatially Explicit Source-Sink Models, Metapopulation Models, Dispersal Models, Niche Models  (10 hours)
Models in Community Ecology: Island Biogeography Theory, Unified Neutral Theory of Biodiversity and Biogeography, Food Web Models (5 hours)
Models in Ecosystem Ecology: Global Carbon Dynamics, Integrated Assessment Models (4 hours)
Confronting Models with Data: Sum of squares, Maximum likelihood,  Bayesian Goodness of Fit (3 hours)

**Location**: Dep. de Biologia Animal, FCUL (room 2.3.16)

**Nº (min, max) students**: 5 - 20

**Minimum formation**: 'Licenciatura' (bachelor) in Biology or related areas, preferably having some previous background in Population Dynamics or another course in Ecological Modelling

**Fee**:  free for PhD students in the Doctoral programme in Biology (FCUL) or Biodiversity, Genetics and Evolution (UL; UP); 100 euros for master and bachelor students in FCUL; 200 euros for others

**Deadline for applications**: January 15, 2010
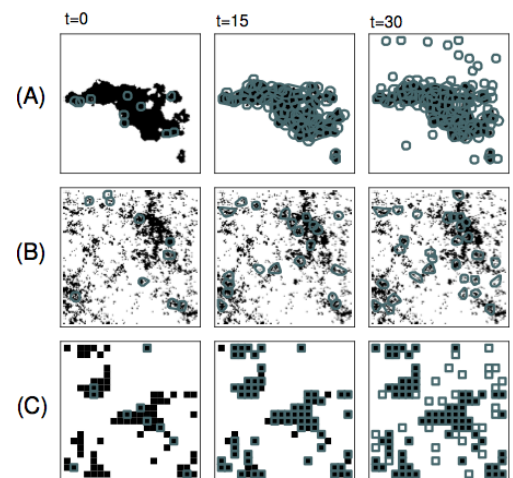
Candidates should send a short CV and a motivation letter to Henrique Pereira at the following email address: hmlpereira@fc.ul.pt