Mathematical Models in Evolution and Ecology 2007: Programme

Wednesday September 19

19.00 Optional social meeting in the Regency Tavern, Brighton

Thursday September 20

9.00-10.15 Registration open Pevensey 2A12

10.15-10.25 Welcome Pevensey 1A7

10.25-11.10 Plenary lecture 1.1 Pevensey 1A7
Speaker: John McNamara
Title: The importance of individual differences for games of conflict, and the evolution of cooperation
Chair: Sean Collins

11.10-12.40 Parallel sessions 2.1-2.4
Session 2.1 Pevensey 1A7
Mathematical models on group decision making in animals
Session 2.2 Pevensey 1A1
Neutral evolution and complexity
Session 2.3 Pevensey 1A3
Genetic modelling I
Session 2.4 Pevensey 2A1
Population Ecology I

12.40-13.40 Lunch Pevensey Common Room and Pevensey 2A12

13.40-15.10 Parallel sessions 2.5-2.8
Session 2.5 Pevensey 1A7
Recent progress in the theory of adaptive dynamics
Session 2.6 Pevensey 1A1
Anti-predatory behaviour
Session 2.7 Pevensey 1A3
Epidemic modelling
Session 2.8 Pevensey 2A1
Population Ecology II

15.10-16.15 Poster Session 3.1 and Coffee
Pevensey Common Room and Pevensey 2A12

16.15-17.00 Plenary lecture 1.2 Pevensey 1A7
Speaker: Patsy Haccou
Title: Generalized wars of attrition in biology
Chair: Hans Metz

17.00-17.45 Plenary lecture 1.3 Pevensey 1A7
Speaker: Chris Cannings
Title: Networks in Biology
Chair: Roger Bowers

19.30-23.00 Conference social event
Imperial Hotel (First Avenue, Hove)

Friday September 21

9.00-9.45 Plenary lecture 1.4 Pevensey 1A7
Speaker: Sergey Gavrilets
Title: Dynamics of coalition formation and the egalitarian revolution
Chair: David Waxman

9.45-10.30 Plenary lecture 1.5 Pevensey 1A7
Speaker: Karl Sigmund
Title: Between Freedom and Coercion: The emergence of costly punishment
Chair: Josef Hofbauer

10.30-11.00 Coffee Pevensey Common Room and Pevensey 2A12

11.00-12.30 Parallel sessions 2.9-2.12
Session 2.9 Pevensey 1A7
Green beards and spite
Session 2.10 Pevensey 1A1
Mathematical models of mate selection
Session 2.11 Pevensey 1A3
Living in groups
Session 2.12 Pevensey 2A1
Population Ecology III

12.30-12.50 Research students' meeting (continued over lunch) Pevensey 1A1

12.50-13.50 Lunch Pevensey Common Room and Pevensey 2A12

13.50-15.00 Parallel sessions 2.13-2.16
Session 2.13 Pevensey 1A7
Host and pathogen: Epidemiology and evolution
Session 2.14 Pevensey 1A1
Kleptoparasitism and other interference behavior I
Session 2.15 Pevensey 1A3
Spatial and geometric influences on evolution
Session 2.16 Pevensey 2A1
Population and adaptive dynamics

15.00-16.00 Poster Session 3.2 and Coffee
Pevensey Common Room and Pevensey 2A12

16.00-17.10 Parallel sessions 2.17-2.20
Session 2.17 Pevensey 1A7
The evolution of cooperation
Session 2.18 Pevensey 1A1
Kleptoparasitism and other interference behavior II
Session 2.19 Pevensey 1A3
Modelling with uncertainty
Session 2.20 Pevensey 2A1
Genetic modelling II

17.15-18.00 Plenary lecture 1.6 Pevensey 1A7
Speaker: Yoh Iwasa
Title: The leading eight: social norms that can maintain cooperation by indirect reciprocity
Chair: Rufus Johnstone

CONFERENCE CLOSES

Parallel Sessions

The precise timings listed here are to emphasise the importance of keeping to time. Speakers have 20 minutes including questions, with two and a half minutes turnaround time between presentations. Chairs will be asked to be strict to keep the conference running smoothly.

2.1 *Mathematical models on group decision making in animals*
Chair: Larissa Conradt
11.10 Iain Couzin
Collective motion and decision-making in animal groups
11.32.30 David Sumpter
Robust algorithms for collective decision-making.
11.55 Jens Krause
Consensus decision-making in human crowds
12.17.30 Larissa Conradt
Consensus decisions in animals

2.2 *Neutral evolution and complexity*
Chair: Joel Peck
11.10 Daniel Lawson
An analytical method for neutral evolution in a type space
11.32.30 Colin Johnson
Multi-level neutrality
11.55 Nadiah Kristensen
Food web attributes in Webworld models that mediate the relationship between species richness and invasibility
12.17.30 James Dyke
Increasing complexity can increase stability in a self-regulating ecosystem

2.3 *Genetic modelling I*
Chair: Etienne Sirot
11.10 Margaret Hurley
A model for environmental sex reversal in fish
11.32.30 Michel Durinx
Assortative mate choice and dominance modification: alternative ways of removing heterozygote disadvantage.
11.55 Tim Sluckin
Mechanisms of human demic expansion
12.17.30 David Waxman
Singular solutions of the diffusion equation of population genetics

2.4 *Population Ecology I*
Chair: Vlastimil Krivan
11.10 Anne Kandler
A diffusion-reaction type approach for modelling language competition
11.32.30 Simona Hapca
Anomalous Diffusion of Heterogeneous Populations Characterised by Normal Diffusion at the Individual Level
11.55 Abbey Trewenack
Dispersal and settling of translocated populations with a New Zealand amphibian case study
12.17.30 Femke van den Berg
Can the presence of plant pathogens explain the coexistence of plant species?

2.5 *Recent progress in the theory of adaptive dynamics*
Chair: Amaury Lambert
13.40 Michael Kopp
An analytical approach to competitive speciation
14.02.30 Hans (J.A.J.) Metz
The canonical equation of adaptive dynamics in Mendelian and structured populations
14.25 Geza Meszena
From population dynamics to adaptive dynamics
14.47.30 Nicolas Champagnat
Including genetic drift in adaptive dynamics: the canonical diffusion

2.6 *Anti-predatory behaviour*
Chair: Andrew Jackson
13.40 Andrew Jackson
Evolving information processing rules for collective anti-predator vigilance
14.02.30 Etienne Sirot
Can game theory help to understand why bird flocks tolerance to disturbance is so variable ?
14.25 Peter Bednekoff
The value and evolutionary stability of sentinel behavior

2.7 *Epidemic Modelling*
Chair: Istvan Kiss
13.40 Andrew Nevai
A discrete-time SIS patch model
14.02.30 Valeriy Perminov
An individual-based model for simulation of influenza epidemic spreading in cities
14.25 Steven Webb
Epidemiological interactions between the local and the mean-field: how and when does spatial population structure matter?
14.47.30 Bernhard Voelkl
Modelling information transmission in small-scale societies using weighted multigraphs

2.8 *Population Ecology II*
Chair: Graeme Ruxton
13.40 Martin Harrison
A model of brood parasitism using extensive form games
14.02.30 Sean Collins
A reinforcement-learning model for population games
14.25 Frederic Hamelin
Parental care as a differential game
14.47.30 Anastassios Tsoularis
Mathematical models of Batesian mimicry

2.9 *Green beards and spite*
Chair: Vincent Jansen
11.00 Andy Gardner
Altruistic and Spiteful Greenbeards
11.22.30 Minus van Baalen
Communication and Kin Selection
11.45 Rufus Johnstone
Sex differences in dispersal and social behaviour
12.07.30 Vincent Jansen
The evolution of spite through stochastic effects, illustrated by the Wolbachia parasite.

2.10 *Mathematical models of mate selection*
Chair: Steve Alpern
11.00 David Ramsey
A continuous time, large population game theoretic model of mate choice
11.22.30 Tim Fawcett
Previous experiences shape optimal mate preferences
11.45 Steve Alpern
When does male choice play a role in mate selection?
12.07.30 Ioanna Katrantzi
Analysis of Equilibrium Behaviour in a Mating Game with Homotypic Preferences

2.11 *Living in groups*
Chair: Jens Krause
11.00 Lesley Morrell
Adaptive geometry for the selfish herd: strategies for aggregation
11.22.30 Marek Spinka
When to go with the crowd: the role of time asymmetry in behavioural synchronization in groups
11.45 Vlastimil Krivan
The habitat selection game
12.07.30 Joel Peck
Can Darwin's theory of natural selection be usefully applied to groups, societies and ecosystems?

2.12 *Population Ecology III*
Chair: Anne Kandler
11.00 Ludek Berec
Multiple Allee effects
11.22.30 Nathaniel Virgo
Modelling the Production of Entropy in Ecosystems
11.45 Javier G. P. Gamarra
Water eddies and phytoplankton persistence: a chemostat's perspective.
12.07.30 Samares Pal
Mathematical modelling on harmful algal blooms in the presence of toxic substances

2.13 *Host and pathogen: epidemiology and evolution*
Chair: Andrew Nevai
13.50 Roger Bowers
The evolution of host-resistance to infection
14.12.30 Rachel Bennett
Modelling the Co-evolution of Hosts and Pathogens
14.35 Istvan Kiss
Parasite strain coexistence in a heterogeneous host population

2.14 *Kleptoparasitism and other interference behavior I*
Chair: Jan Rychtar
13.50 Etienne Sirot
Predicting the occurrence of conflicts and the strength of interference in social foragers with a game-theoretic model of aggression.
14.12.30 Jaap van der Meer
Interference among a finite number of predators: a stochastic version of the Beddington-DeAngelis functional response model
14.35 Isabel Smallegange
Distributions of ideal, free but unequal predators are not necessarily (semi) truncated

2.15 *Spatial and geometric influences on evolution*
Chair: Peter Sozou
13.50 Pen Holland
Landscape as a model: the importance of geometry
14.12.30 Ace North
The role of spatial dynamics in shaping phenotypic plasticity
14.35 Mathias Gauduchon
Evolution of mutualism in a spatially structured environment.

2.16 *Population and adaptive dynamics*
Chair: Nadiah Kristensen
13.50 Emily Hackett-Jones
Evolution of parasitoid life-history characteristics
14.12.30 Amaury Lambert
Quasi-stationarity in population dynamics
14.35 Thomas Evans
Adaptive dynamics of temperate phages

2.17 *The evolution of cooperation*
Chair: Iain Couzin
16.00 James Marshall
Lost in the Crowd? The Evolution and Ecology of Reciprocal Cooperation in Viscous Populations
16.22.30 Peter Sozou
Altruism and spite in viscous populations
16.45 Benedikt Herrmann
The harmful part of altruistic punishment in a situation of conflict between groups

2.18 *Kleptoparasitism and other interference behavior II*
Chair: Jan Rychtar
16.00 Anders Nilsson
Higher-order effects of kleptoparasitism in pike
16.22.30 Roger Luther
Game theory and kleptoparasitism
16.45 Jan Rychtar
The evolution of kleptoparasitic strategies under adaptive dynamics

2.19 *Modelling with uncertainty*
Chair: Bernhard Voelkl
16.00 James Gibbons
Bayesian model averaging for models in evolution and ecology
16.22.30 Jon Pitchford
Uncertain evolution
16.45 Victor China
The Biological Market of Cleaner Wrasse and their Reef-Fish Clients

2.20 *Genetics modelling II*
Chair: Emily Hackett-Jones
16.00 Chris Watkins
The Evolution of Genetic Codes
16.22.30 Harold Vladar
Free fitness, entropy and evolutionary potentials of quantitative traits
16.45 Inez Demon
Introgression of resistance genes between populations: A model study of insecticide resistance in the sweet potato whitefly

Poster sessions

Poster presenters should be by their poster at the two hour sessions designated

1 Jenny Burrow
Uncertain data in uncertain models: Do wild boar vary across Europe?
2 Farida Chamchod
Modelling Dutch Elm Disease
3 Joseph Chipperfield
Space Invaders: Population Dynamics, Climate and Invasive Species
4 Simon Croft
Stochastic differential equation models of plant growth and competition.
5 S. Anaid Diaz
The effect of vital rate variability on population growth rate
6 Meghan Fitzgerald
Kleptoparasitism: When Resources Grow Scarce a Pirate Awaits
7 Jeremy Kendal
The Cultural Evolution of Self-Medication: why common treatments are not necessarily efficacious.
8 Andrew King
Information use and decision- making in social groups
9 Andres Eduardo Quiones
Simulating model to see the effect of preference variation in the population of Parides panares (Papilionidae-troidine)
10 Luke Rendell
When does copying pay? Toward a theoretical understanding of social learning strategies
11 Tomas Revilla
Non-equilibrium dynamics of a resource competition model with nutrient storage
12 Ian Sorrell
The Evolutionary Dynamics of Covert Infection
13 Sunny Townsend
Could an intestinal parasite Trichostrongylus retortaeformis determine the population dynamics of the Scottish mountain hare Lepus timidus?