

## Abridged timetable of MBE'17

Tuesday April 4<sup>th</sup>

8.20-9.00	Registration
9.00-9.10	Welcome talk
9.10-10.00	Plenary talk 1 (Hans Metz)
10.00-10.50	Plenary talk 2 (John McNamara)
10.50-11.20	Coffee break
11.20-13.00	Contributed talks (session 1)
13.00-14.10	Lunch break
14.10-15.00	Plenary talk 3 (Eva Kisdi)
15.05-16.05	Contributed talks (session 2)
16.05-16.35	Coffee break
16.35-18.15	Invited talks

Wednesday April 5<sup>th</sup>

9.00-9.50	Plenary talk 4 (Robert D. Holt)
9.50-10.40	Plenary talk 5 (Kalle Parvinen)
10.40-11.10	Coffee break
11.10-12.50	Theme session 1: 'Eco-evolutionary models' Contributed talks (session 3)
12.50-14.00	Lunch break
14.00-15.40	Minisymposium: 'Evolutionary dynamics under selections of multiple scales' Theme session 2: Modelling evolution of cooperation
15.40-16.10	Coffee break
16.10-17.10	Contributed talks (sessions 4,5)
17.20-18.20	Honorary Lecture (Karl Sigmund)
18.20-20.00	Reception and poster session

Thursday April 6<sup>th</sup>

9.00-9.50	Plenary talk 6 (Alexander Gorban)
9.50-10.40	Plenary talk 7 (Philip Maini)
10.40-11.10	Coffee break
11.10-12.50	Minisymposium: 'Molecular evolution and fitness landscapes'. (Part I) Minisymposium: 'How does spatial structure influence cancer evolution'(Part I)
12.50-14.10	Lunch break
14.10-16.10	Contributed talks (sessions 6,7)
16.10-16.40	Coffee break
16.40-18.20	Minisymposium: 'Molecular evolution and fitness landscapes'. (Part II) Minisymposium: 'How does spatial structure influence cancer evolution'(Part II)

Friday April 7<sup>th</sup>

9.00-9.50	Plenary talk 8 (Hanna Kokko)
9.50-10.40	Plenary talk 9 (Sylvie Méléard )
10.40-11.10	Coffee break
11.10-12.50	Contributed talks (sessions 8,9)
12.50-14.00	Lunch break
14.00-15.00	Contributed talks (sessions 10,11)
15.10-15.15	Closing address and the end of the conference

# Detailed Conference Program

**Tuesday April 4<sup>th</sup>**

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Venue: Bennett Building, ground floor

8.20-9.00 **Registration**

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9.00-10.50 **Introduction and plenary talks 1, 2**

Venue: Bennett Building, Lecture Theatre 1 (BEN LT1)

9.00-9.10 **Introduction and welcome address**

9.10-10.00 **Plenary talk 1. Hans Metz.** Evolutionary branching in the multivariate case

10.00-10.50 **Plenary talk 2. John McNamara.** Towards a richer evolutionary game theory.

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10.50-11.20 Coffee break: Bennett Building, ground floor

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11.20-13.00 **Contributed talks** (session 1)

Venue: Bennett Building, Lecture Theatre 1 (BEN LT1)

11.20-11.40 **Yoav Soen.** Darwinian selection induces lamarckian adaptation in a holobiont model

11.40-12.00. **Mark Broom.** Game theoretical modelling of a dynamically evolving network

12.00-12.20 **Anne Kandler.** Novelty, popularity, and emergent neutrality: Detecting transmission biases in population-level data.

12.20-12.40 **Michael Sieber.** Neutral model of microbiome composition

12.40-13.00. **John Norbury.** Defining a food web landscape for quantitative trait (QT) population modelling.

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13.00-14.10 Lunch break

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Venue: Bennett Building, Lecture Theatre 1 (BEN LT1)

14.10-15.00 **Plenary talk 3. Eva Kisdi.** **Dispersal polymorphisms in stable habitats.**

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15.05-16.05 **Contributed talks** (session 2)

Venue: Bennett Building, Lecture Theatre 1 (BEN LT1)

15.05-15.25 **Ludek Berec.** Density-dependent selection on mate search and evolution of Allee effects.

15.25-15.45. **Barbara Boldin.** Evolutionary suicide of pathogens.

15.45-16.05 **Matthew Adamson.** Identifying the sources of structural sensitivity in ecological models using partially specified models

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16.05-16.35 Coffee break: Bennett Building, ground floor

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## 16.35-18.15 **Invited talks**

Venue: Bennett Building, Lecture Theatre 1 (BEN LT1)

16.35-17.00 **Tamas David-Barrett**. Fertility, kinship and the evolution of mass ideologies

17.00-17.25 **Vincent Jansen**. The evolution of sex-specific virulence in infectious diseases.

17.25-17.50 **Olof Leimar**. Genetic conflict with a basis in ecology.

17.50-18.15 **Richard A. Watson**. The learning principles of evolution by natural selection.

*Time for rest and relaxation*

## Wednesday April 5<sup>th</sup>

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### 9.00-10.40 **Plenary talks 4,5**

Venue: Bennett Building, Lecture Theatre 1 (BEN LT1)

9.00-9.50 **Plenary talk 4. Robert D. Holt**. Thoughts on the interplay of demographic stochasticity, fitness, and the niche concept.

9.50-10.40 **Plenary talk 5. Kalle Parvinen**. The effect of spatial heterogeneity on evolution in spatial models

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10.40-11.10 Coffee break: Bennett Building, ground floor  
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### 11.10-12.50 **Theme session 1: Eco-evolutionary models**

Venue: Bennett Building, Lecture Theatre 1 (BEN LT1)

11.10-11.30 **Alex Best**. The impact of community interactions on host-parasite evolution.

11.30-11.50 **Farnoush Farahpour**. Eco-evolutionary dynamics in interaction space of competitive communities: How diversity emerges and persists.

11.50-12.10 **Charlotte de Vries**. Combining stage-classified demography and population genetics to study eco-evolutionary dynamics.

12.10-12.30 **Jan Olaf Mirko Härter**. Assembly rules and a minimal theory for invasion and extinction in food webs.

12.30-12.50 **Veronika Bernhauerova**. Evolution of mate-finding Allee effect in prey.

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11.10-12.50 **Contributed talks** (session 3)

Venue: Bennett Building, Lecture Theatre 3 (BEN LT3)

11.10-11.30 **Jörgen Ripa**. Speciation cube trajectories cluster around three modes of parapatric speciation.

11.30-11.50 **Thomas Aubier**. Speciation along ecological gradients and the costs of choosiness.

11.50-12.10 **Richard J. Bingham**. RNA virus evolution via a quasi-species theory-based model reveals a novel drug target.

12.10-12.30 **Sophie Péniisson**. A genealogical model for the ancestor paradox

12.30-12.50 **Cornelia Metzgi**. Phylogenies from dynamic networks.

12.50-14.00 Lunch break

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14.00-15.40 **Minisymposium: Evolutionary dynamics under selections of multiple scales**

Venue: Bennett Building, Lecture Theatre 1 (BEN LT1)

14.00-14.25 **Xiang-Yi Li**. Softness of selection and the evolution of sex-biased dispersal.

14.25-14.50. **Piter Bijma**. The consequences of multilevel selection and interactions among kin: a quantitative genetic approach

14.50-15.15 **Yuriy Pichugin**. Fitness correlation as a new indicative metric of transition in Darwinian individuality.

15.15-15.40 **Florence Debarre**. Fidelity of parent-offspring transmission and the evolution of social behavior in structured populations.

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14.00-15.40 **Theme session 2: Modelling evolution of cooperation**

Venue: Bennett Building, Lecture Theatre 3 (BEN LT3)

14.00-14.25. **Felix Geoffroy**. Partner choice and the evolution of mutually beneficial cooperation

14.25-14.50. **Johannes Müller (in the memory of Burkhard Hense)**. Do phages help to stabilize cooperative behavior of bacteria?

14.50-15.15 **Adam Kun**. Why animals cooperate? – The insensitivity of the Snowdrift Game to network dynamics

15.15-15.40 **Rebecca Hoyle**. Modelling social influence on cooperation: the public goods game on a multiplex network

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15.40-16.10 Coffee break: Bennett Building, ground floor

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16.10-17.10 **Contributed talks** (session 4)

Venue: Bennett Building, Lecture Theatre 1 (BEN LT1)

16.10-16.30 **Gergely Boza**. The evolution and stability of reactive investment strategies.

16.30-16.50 **Patrick Doncaster**. Mitigation cannot be nature's sole answer to climate change.

16.50-17.10 **Khatri Bhavin**. Fisher's angular transformation and quantifying evolutionary dynamics from variant-frequency time series - a case of genetic flux not drift.

16.10-17.10 **Contributed talks** (session 5)

Venue: Bennett Building, Lecture Theatre 3 (BEN LT3)

16.10-16.30 **Ricardo Martinez-Garcia**. Lack of ecological and life-history context can create the illusion of social interactions.

16.30-16.50 **Omer Edhan**. Sex with no regrets.

16.50-17.10 **Alexander Lange**. A mathematical framework for predicting lifestyles of viral pathogens.

17.20-18.20 **Honorary Lecture**

Venue: Bennett Building, Lecture Theatre 1 (BEN LT1)

17.20-18.20 **Karl Sigmund**. The prisoner's dilemma: partners and rivals

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18.20-20.00 **Poster session and wine reception**: Bennett Building, ground floor

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*Time for rest and relaxation*

## Thursday April 6<sup>th</sup>

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### 9.00-10.40 Plenary talks 6,7

Venue: Bennett Building, Lecture Theatre 1 (BEN LT1)

9.00-9.50 **Plenary talk 6. Alexander Gorban.** Adaptation free energy: The third generation of models of physiological adaptation

9.50-10.40 **Plenary talk 7. Philip Maini.** Modelling collective cell movement.

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10.40-11.10 Coffee break: Bennett Building, ground floor  
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### 11.10-12.50 Minisymposium: Molecular evolution and fitness landscapes. Part I

Venue: Bennett Building, Lecture Theatre 1 (BEN LT1)

11.10-11.35 **Ard Louis.** Genotype-phenotype maps: when does variation dominates over selection?

11.35-12.00. **Joshua L. Payne.** Exhaustively-enumerated genotype-phenotype maps in transcriptional regulation

12.00-12.25 **Roberto Alamino.** Modelling of the evolution of antimicrobial resistance with Statistical Physics.

12.25-12.50 **Marjon de Vos.** Breaking through evolutionary constraint by variable environments.

### ----- 11.10-12.50 Minisymposium: How does spatial structure influence cancer evolution? Part I -----

Venue: Bennett Building, Lecture Theatre 3 (BEN LT3)

11.10-11.35 **Benjamin Werner.** Detecting truly clonal alterations from multi-region profiling of solid tumours

11.35-12.00. **Chay Paterson.** An exactly solvable, spatial model of mutation accumulation in cancer.

12.00-12.25 **Cindy Gidoin.** The use of range expansion framework to better understand the evolutionary dynamics of cancer

12.25-12.50. **Jill A. Gallaher.** Adaptive Therapy for Heterogeneous Cancer: exploiting space and trade-offs in drug scheduling.

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12.50-14.10 Lunch break  
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### 14.10-16.10 Contributed talks (session 6)

Venue: Bennett Building, Lecture Theatre 1 (BEN LT1)

14.10-14.30. **Arturo Araujo.** Mathematical and computational modeling of tumor cell/bone microenvironment interactions.

14.30-14.50 **Jean Clairambault.** Why is evolution important in cancer and what mathematics should be used to treat cancer?

14.50-15.10 **Robert Noble.** Evolutionary ecology of senescence and cancer risk: from naked mole rats to modern humans.

15.10-15.30 **Johannes Müller.** The effect of fluctuating population size and seedbanks on evolution

15.30-15.50 **Ivan Tyukin.** High-dimensional brain: a blessing or a curse?

15.50-16.10 **Valeri Makarov.** Construction of compact cognitive maps for limb manipulation in dynamic situations

14.10-16.10 **Contributed talks** (session 7)

Venue: Bennett Building, Lecture Theatre 3 (BEN LT3)

14.10-14.30 **Michael Stich**. Replicator dynamics on an RNA fitness landscape

14.30-14.50 **Ramses Djidjou Demasse**. Steady state concentration for an evolutionary epidemic system.

14.50-15.10 **Louise Lassalle**. Evolution of medication strategies in the monarch butterflies.

15.10-15.30 **Andreas Weber**. Gene networks accelerate evolution by fitness landscape learning

15.30-15.50 **Charle Mullan** A kin selection perspective on multi-dimensional adaptive dynamics in subdivided populations

15.50-16.10 **Omri Tal**. A new perspective from information theory on properties of genetic sequences

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16.10-16.40 Coffee break: Bennett Building, ground floor  
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16.40-18.20 **Minisymposium: ‘Molecular evolution and fitness landscapes. Part II’**

Venue: Bennett Building, Lecture Theatre 1 (BEN LT1)

16.40-17.05 **Jacobo Aguirre**. Towards a theory of competition in evolutionary systems modelled as complex networks.

17.05-17.30 **András G. Hubai**. The coexistence of independent genes is aided by multilevel selection, but only to a limited extent.

17.30-17.55 **Saúl Ares**. Gene regulatory networks that optimize the cost of performing a function: pattern formation in nitrogen-fixing cyanobacteria.

17. 55-18.20. **Sebastian Ahnert**. The organisation of biological information determines fundamental properties of genotype-phenotype maps

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16.40-18.20 **Minisymposium: How does spatial structure influence cancer evolution? Part II**

Venue: Bennett Building, Lecture Theatre 3 (BEN LT3)

16.40-17.05 **Ewa Szczyrek**. Modeling metastasis formation and its bottleneck.

17.05-17.30 **Laura Hindersin**. Amplification and suppression of selection in cancer mutations through tissue structure.

17.30-17.55. **Artem Kaznatcheev**. Effective games and operationalizing spatial structure.

17. 55-18.20. **Philip Gerlee**. Spatial structure and the dynamics of growth factor production in solid tumours

*Time for rest and relaxation*

**Friday April 7<sup>th</sup>**

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9.00-9.50 **Plenary talks 8,9**

Venue: Bennett Building, Lecture Theatre 1 (BEN LT1)

9.00-9.50 **Plenary talk 8. Hanna Kokko**. Bet-hedging in evolutionary theory.

9.50-10.40 **Plenary talk. Sylvie Méléard**. The effect of competition and horizontal inheritance on invasion, fixation and evolution.

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10.40-11.10 Coffee break: Bennett Building, ground floor  
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11.10-12.50 **Contributed talks** (session 8)

Venue: Bennett Building, Lecture Theatre 1 (BEN LT1)

11.10-11.30. **Magnus Lindh** Evolving phenology of root and shoot allocation

11.30-11.50. **Alexandru Hening**. Stochastic population growth in spatially heterogeneous environments: The density-dependent case.

11.50-12.10. **Max Souza**. On the stochastic evolution of finite population

12.10-12.30. **Philipp Thomas**. Single-cell histories in growing populations: relating physiological variability to population growth

12.30-12.50. **Andrew Pomiankowski**. Sexual conflict over the inheritance of mitochondria

11.10-12.50 **Contributed talks** (session 9)

Venue: Bennett Building, Lecture Theatre 8, (BEN LT8)

11.10-11.30. **Oleg Kuzenkov**. Modelling diel vertical migration of zooplankton using variational principle.

11.30-11.50. **Galina Kuzenkova**. Mathematical modelling of natural selection processes using the dynamics of measure.

11.50-12.10. **Sybille Duehring**. Modelling the host-pathogen interactions of macrophages and *Candida albicans* using game theory and dynamic optimization.

12.10-12.30. **Lourdes Juan**. Space/time evolutionary stoichiometric model for the algae-daphnia ecosystem.

12.30-12.50. **Pietro Landi**. Evolution of the good colonizer syndrome of high self-fertilization and dispersal rates in a metapopulation: model predictions reconcile with Baker's law.

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12.50-14.00 Lunch break  
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14.00-15.00 **Contributed talks** (session 10)

Venue: Bennett Building, Lecture Theatre 1 (BEN LT1)

14.00-14.20 **Christopher Turkington**. The role of localised hypermutation in resistance of *Haemophilus influenzae* to bacteriophage predation

14.20-14.40 **Aurélien Velleret**. Quasi-stationary distributions for a model of populations adapting to a changing environment

14.40-15.00 **Jacob Johansson**. Birds, mistimed reproduction and evolutionary games in a warming world.

14.00-15.00 **Contributed talks** (session 11)

Venue: Bennett Building, Lecture Theatre 8, (BEN LT8)

14.00-14.20 **Jonas Wickman**. Determining selection across heterogeneous landscapes: a perturbation-based method and its application to modelling evolution in space.

14.20-14.40 **Charlotte Ferris**. Evolution of host defence in fluctuating environments

14.40-15.00 **Paula Vasconcelos** How organismal complexity affects evolutionary diversification

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15.10-15.15 **Closing address and end of meeting.**

Venue: Bennett Building, Lecture Theatre 1 (BEN LT1)