

Mathematical Modelling in Ecology and Evolution

Session, Symposium & Plenary Details

University College Cork · 21–24 July 2026

S = Conference session · *SM* = Symposium · *P* = Plenary

Plenary Talks

Tuesday 09:15–10:00 · G05

Prof Volker Grimm

Agent-Based Models and System Dynamics: you should never walk alone

Tuesday 17:00–19:00 · G05, Western Gateway Building

Prof Alan Hastings

An Inverse Approach for Understanding Ecological Coexistence

Wednesday 09:00–09:45 · G05

Prof Anne Kandler

Mathematical models in cultural evolution: Bridging theory and data

Thursday 09:00–09:45 · G05

Prof Barbora Trubenová

From theory to therapy: Investigating drug resistance evolution across disciplines and taxonomic boundaries

Thursday 13:00–13:45 · G05

Prof Maria McNamara

Towards an integrated understanding of melanin evolution in vertebrate animals: progress in the analysis of fossils and modern analogues

Friday 11:00–12:00 · G05

Prof Jonathan A. Sherratt

Vegetation Patterns: From African Deserts to Scottish Hillsides

Tuesday 21st July

10:30–12:00 — Opening Parallel Sessions (3 talks each)

S1 G01 Fitness Landscapes & Epistasis

1. **Generating fitness landscapes with custom patterns of global epistasis; towards a more predictive understanding of evolution**
Anna Sigalou, Juan Díaz-Colunga
2. **Submodular Epistasis: Consequences for Accessibility and Relevance in Empirical Fitness Landscapes**
Daniel Oros, Joachim Krug
3. **Apparent maladaptation and the equilibrium distribution of fitness effects in Fisher's geometric model**
Laura Hayward, Kseniia Khudiakova, Nicholas Barton

S2 G02 Structure & Stability of Ecological Networks

1. **Modularity increases the resilience of tree-liana interaction networks by reducing destabilising feedback**
Rémi Legrand, Franziska Koch, Bismark Oforu-Bamfo, Korinna Allhoff
2. **Phenologically Explicit Robustness Metric Reveals Increased Vulnerabilities in Temporal Plant-Pollinator Networks**
Raoul Scribbans, Tim Rogers, Michael Pocock, Richard James
3. **Origins of instability in ecological networks**
Tim Rogers

S3 G03 Pest, Invasion & Biocontrol

1. **Interactions among pest control methods: How to deal with the pest life cycles ?**
Quentin Guilloit, Louise Van Oudenhove, Elisa Thebault, Thierry Spataro
2. **A temperature-dependant spacial model to optimise sterile male releases for *Drosophila suzukii***
Jules Guilberteau, Louise van Oudenhove
3. **Optimal surveillance and control in a source - recipient invasion system under imperfect detection**
ANUJ KUMAR UMRAO, Adam Lampert

S4 G04 Evolutionary Game Theory: Stochastic Dynamics & Networks

1. **Emergence of polymorphism in stochastic evolutionary games**
Bill Nunn, Tim Rogers, Marcel Ortgiese
2. **Structure and strategy: how evolutionary games influence interaction networks**
Christoph Riedl, Rory Smead, Seyed-Ahmad Ahmadi
3. **Evolutionarily stable strategies in multiplayer games: The viewpoint of an invader**
Felipe Murgel, Max Souza

S5 G05 Adaptation and Coevolution in Changing Environments

1. **Failure of the Fittest: Limits of Asexual Adaptation to Environmental Change in Finite Populations**
Rebekah Hall, Vincent Calvez, Matthew Osmond
2. **Host-Parasite Coevolution in Complex Landscapes**
Saimit Naik, Jhelam Deshpande, Oliver Kaltz, Emanuel Fronhofer

13:00–14:45 — Symposia

SM1 G01 Mathematical genetics of pedigrees

Organisers: Noah Rosenberg, John Wakeley

1. **Genetic contribution of ancestors in the biparental Moran model**
Camille CORON
2. **Patterns of coalescence and genetic variation in autotetraploid species conditional on the population pedigree**
John Wakeley, Michelle Gaynor, Justin Conover
3. **Convergence to a conditional ancestral recombination graph for diploid exchangeable population models given the pedigree**
Frederic Alberti
4. **Shared ancestors and the birthday problem**
Lily Agranat-Tamir, Kennedy Agwamba, Jazlyn Mooney, Noah Rosenberg

SM2 G02 Modelling eusocial systems

Organisers: Arthur Weyna, Malvika Srivastava

1. **Adaptive evolution of eusocial ant colonies with antagonistic selection and genetic drift**
Malvika Srivastava, Charles Mullan
2. **Early-season helping yields increasing returns to scale at the onset of eusociality**
Tom Wenseleers, Ricardo Caliri Oliveira, Viviana Di Pietro
3. **How Energy Transfers Between Kin Affect Life History Evolution**
Piret Avila, Laurent Lehmann
4. **Simple behavioral rules are sufficient to produce Hymenoptera social diversity**
Daniel Jorge, Sarah Kocher, Corina Tarnita

SM3 G03 The evolution of reproductive systems

Organisers: Ewan Flinham, Thomas Lesaffre

1. **Is there a causal link from gametes to sexual selection and the evolution of reproductive strategies?**
Jussi Lehtonen
2. **Modelling condition dependent female preferences and their evolutionary consequences.**
Julie Roux, Ewan Flinham, Charles Mullan
3. **Selection-mutation stationary distributions of resource allocation to male and female functions**
Sylvain Billiard, Matthieu Alfaro, Diane Douet, Lionel Roques
4. **The eco-evolutionary dynamics of sexual traits that increase mate encounter rates**
J. Colton Watts, Courtney Fitzpatrick

SM4 G04 Modelling the BEF Relationship using Species' Relative Abundances - The Diversity-Interactions Approach

Organisers: Laura Byrne

1. **The Diversity-Interactions (DI) approach for modelling the biodiversity and ecosystem function relationship**
Rishabh Vishwakarma, Laura Byrne, Rafael Moral, Catherine Hurley, John Finn, Caroline Brophy
2. **Modelling proportional responses using beta mixed-effects Diversity-Interactions models**
Rouven Lattner, John Finn, Carsten Malisch, Giovanni Peratoner, Marie-Noëlle Thivierge, Caroline Brophy
3. **Asymptotic inference for ecosystem multifunctionality based on multivariate Diversity-Interactions models**
Die Hu, Matthias Suter, Caroline Brophy
4. **Diversity-Interactions models for predicting the total response and breakdown by species proportions in biodiversity experiments**

Laura Byrne, Forest Isbell, Rafael A. Moral, John Finn, Guylain Grange, Hannah Comiskey, Caroline Brophy

SM5 G05 Pattern formation in socio-ecological systems

Organisers: *Denis Patterson, Daniel Cooney*

1. **Pattern formation and regime shifts in spatial stochastic vegetation models**
Denis Patterson
2. **Vegetation patterns in heterogeneous drylands and their consequences for ecosystem resilience.**
Ricardo Martinez Garcia, David Pinto-Ramos
3. **Emergence of opinion clusters in bounded-confidence dynamics on networks: a mean-field analysis**
Alina Dubovskaya, Susan C. Fennell, Kevin Burke, James Gleeson, Doireann O'Kiely
4. **Drivers and detriments of the spatial heterogeneity of harmful cyanobacterial blooms**
Jacob Serpico

15:15–17:00 — Parallel Sessions

S6 G01 Epidemic & Disease Transmission Models I

1. **Transmission dynamic modelling to understand the impacts of vaccines on antibiotic resistance epidemiology: a systematic review**
Madison Luick, Natasha Salant, Shiela Marie Selisana, Aye Nandar Mynit, Chittawan Poonsiri, Koen Pouwels, David RM Smith
2. **Cost-effectiveness of female-only and gender-neutral HPV vaccination strategies in Japan**
Minjin Kim, Eunha Shim
3. **Transmission mode impacts the spread of a parasite in a spatially structured host population**
Franziska A. Brenninger, Xiang-Yi Li Richter
4. **Optimal long-run control of endemic infections: bang-bang threshold policies in a stochastic SIS-model**
Matthew Buckland, Sören Christensen, Philip Le Borne, **Cornelia Pokalyuk**

S7 G02 Adaptive Dynamics & Life History Evolution

1. **Evolutionary Branching: Road to Coexistence and Dynamics of Separation**
Manuel Esser, Nicolas Champagnat
2. **Adaptive Dynamics in Changing Environments: From Single Traits to Correlated Strategies**
Sakshi Pahujani, Yuna Zhang, Markus Stetter, Joachim Krug
3. **Evolution of dispersal in a spatially heterogeneous population with finite patch sizes and catastrophes**
Kalle Parvinen, Hisashi Ohtsuki, Joe Yuichiro Wakano
4. **Evolution of fast and slow life histories in an unstable environment**
Éloi Martin

S8 G03 Community Ecology & Species Coexistence

1. **Multi-scale ecological processes during assembly drive predictable community structure**
Jonathan A. Sutton-Smutná, Vincent A. A. Jansen, David Tilman, Jane A. Catford
2. **Does diversity always increase with dormancy? Insights from a theoretical multi-species approach**
Agathe Chave-Lucas, Juan Giral Martinez, Silvia De Monte, Régis Ferrière
3. **Disturbance-generated coexistence**
Ursula Trigos-Raczkowski, Rainey Lyons, Matias Delgadion, Azmy Ackleh, **Annette Ostling**

4. Ecology in Chemical Reaction Networks: Concentration Threshold for Single-resource Competition Between Autocatalytic Cycles

Iris Magniez--Papillon, Thomas Koffel, Sylvain Charlat, Denis Kuperberg, Etienne Rajon

S9 G04 Spatial Models, PDEs & Pattern Formation

1. Modelling and inference of wildfire spread dynamics in UK moorland environment.

Axa-Maria Laaperi, Laura Wadkin, Nick Parker, Andrew Baggaley

2. The topology of ecological drift

Ata Kalirad, Ralf Sommer

3. Real-world complexity restricts tipping points and alternative stable states

Santanu Das, Niv DeMalach, Nadav Shnerb

4. Finite-population corrections to mean-field for weakly interacting diffusions

Armand Bernou

S10 G05 Cultural Evolution & Social Learning

1. Evolutionary dynamics of language competition

Nate Bryerton, Sameul Feenane-Levine, Maxwell Goskie, Jason Rackas, Hope Pungello, Zhijun Wu

2. Social learning and information transmission in online chess

Egor Lappo, Uma Dayal, Marcus Feldman, Noah Rosenberg

3. Sequential Accumulation of Independent Cultural Traits: A neutral model for cumulative cultural dynamics

Fredrik Scheie, Fredrik Jansson, Jonas Sjöstrand

4. How cultural systems reshape selection in cultural evolution

Fredrik Jansson, Magnus Enquist, Jérôme Michaud, Anandi Hattiangadi

Wednesday 22nd July

10:15–12:00 — Symposia

SM6 G01 Evolution on complex and dynamic fitness landscapes

Organisers: Julio Ayala-Lopez, Loraine Hablützel

1. A simple model illustrates how adaptive walk endpoints can be biased towards the highest peaks on rugged fitness landscapes

Kye Hunter, Nora Martin

2. Benchmarking empirical fitness landscapes with a random null model: New results on an old problem

Joachim Krug, Daniel Oros

3. Ecological feedback shapes the evolution of antibiotic resistance in E. coli

Pietro Gadaleta, Philip Ruelens, Arjan de Visser, Meike Wortel

4. The ruggedness of eco-evolutionary fitness landscapes of resource competition

Suman Das, Claudia Bank

SM7 G02 Evolutionary graph theory: beyond fixation probabilities on graphs.

Organisers: Nikhil Sharma, Mark Broom

1. Maintaining diversity in structured populations

David Brewster

2. Death rate drives the suppression of natural selection in structured populations

[Max Dew](#), Christopher Overton

3. Fixation probability on metapopulations with asymmetric migration

[Akanksha Singh](#), Arne Traulsen, Nikhil Sharma

4. Mutation-Selection Balance on Graphs

[Nikhil Sharma](#), Suman Das, Arne Traulsen, Joachim Krug

SM8 G03 The genetic and developmental bases of G-matrix evolution

Organisers: *Isabela do Ó, Vitor Sudbrack*

1. The effect of supergene evolution on the structure and stability of the additive genetic variance-covariance matrix

[Vitor Sudbrack](#), Charles Mullan

2. Mind the process: a tripartite GP map may bridge the micro-to-macro divide

[Mihaela Pavlicev](#)

3. The Developmental Basis of the G-matrix

[Lisandro Milocco](#)

4. Evolution of genetic correlations: from models to experiments

[Frédéric Guillaume](#)

SM9 G04 Rethinking density-dependence in eco-evolutionary systems

Organisers: *Giulia Ghedini, Emma Horton*

1. Why Do Populations Slow Down? Rethinking Growth Rate Density Dependence

[Onofrio Mazzarisi](#)

2. Superlinearity: the null expectation for density dependence?

[Andrew Letten](#)

3. How does evolution shape density dependence, species interactions and long-term coexistence

[Inês Fragata](#), Diogo Godinho, Leonor R. Rodrigues, Miguel A. Cruz, Raul Costa-Pereira, Oscar Godoy, Sara Magalhães

4. Probing the drivers of metabolic density-dependence in phytoplankton

[Giulia Ghedini](#)

SM10 G05 Towards a quantitative theory of microbial communities: current modelling approaches and perspectives

Organisers: *Vitor Marquioni Monteiro, Florian Labourel*

1. A New Modeling Framework for Invasion Resistance in Microbial Communities

[Erida Gjini](#)

2. Evaluating data-driven methods for the design and optimization of microbial consortia

[Juan Diaz-Colunga](#), Isabel Quiros-Rodriguez, Ramon Diaz-Uriarte, Álvaro Sánchez

3. Multilevel selection in multi-type populations

[Amanda de Azevedo-Lopes](#), Arne Traulsen

4. Generalized Lotka-Volterra vs. metabolic models as predictive tools for the gut microbiome

Coen Berns, Pim van Leeuwen, Pietro Gadaleta, [Meike Wortel](#)

13:00–14:45 — Parallel Sessions

S11 G01 Epidemic & Disease Transmission Models II

1. **Social cues drive the evolution of plastic pathogen virulence in spatially and temporally variable environments**
Ryuichi Kumata, Sébastien Lion, Edze Westra, Sylvain Gandon
2. **Modeling the impact of antigenic distance and immune imprinting of sequential viral infections on disease severity**
Hayriye Gulbudak, Nazia Afrin, Anna Jolles
3. **Persistent and Transient Outbreak Potential for Insect-Borne Plant Viruses within Multi-Host Environments**
Blake McGrane-Corrigan, Jon Yearsley

S12 G02 Eco-Evolutionary Dynamics

1. **Repeatability of adaptation in interacting species**
Loraine Hablützel, Ailene MacPherson, Claudia Bank
2. **Eco-evolutionary dynamics in competitive systems: coevolution mitigates the potential for evolutionary rescue**
Simon Leoz, Lynn Govaert, Korinna Allhoff, Frithjof Lutscher
3. **Between Friends and Foes - Evolutionary Diversification in Mutualistic-Antagonistic Networks**
Felix Jäger, Nicolas Loeuille, Youssef Yacine, Korinna Allhoff
4. **The role of fitness landscapes for eco-evolutionary dynamics of biodiversity and interaction networks**
Dimitrios Nakos, Malina Palmer, Frank Schurr, Korinna Allhoff

S13 G03 Plant Population Dynamics & Mating Systems

1. **Invasion of a self-compatible mutant allele under sporophytic self-incompatibility: Diploids VS Tetraploids**
Diane Douet, Sylvain Billiard, Xavier Vekemans, Josselin Clo
2. **Multi-level robustness in plant systems: A general modelling framework**
Franziska Koch, Korinna T. Allhoff, Frank M. Schurr
3. **Beyond Resource Budgets: The Evolution of Masting through Flower Induction Inhibition**
Eloi Chauvet, Timothé Renard, Sabrina Gastebois, Thomas Koffel, Samuel Venner
4. **How seed banks evolve in plants: a stochastic dynamical system subject to a strong drift**
Joao Luiz de Oliveira Madeira, Alison Etheridge

S14 G04 Animal Behaviour

1. **Modeling optimal dispersal of juvenile birds**
Ted Galanthay, Whitman Fowlkes, Kate Hartke, Thomas Narramore
2. **Learning to be biased: the evolution of priors under uncertainty**
Katherine Di Iorio, Tom Sherratt
3. **Relative trait value within groups drives arms race dynamics in predator-prey systems**
Yi Sun, Tom Keaney, Hanna Kokko
4. **Adaptive dynamics of discriminate and indiscriminate mating**
Ben Allen, Samatha Rothberg, Brian Lerch

S15 G05 Stochastic & Theoretical Approaches in Mathematical Biology

1. **Fluctuations and isolation by distance in a model with non-local density dependence**
Alison Etheridge, Ruairi Garrett, Leo Tyrpak
2. **From disordered systems physics to complex ecosystems: the many-species Lotka-Volterra model**
Joseph Baron

3. Data-Driven Learning of Transfer Operators for Aggregation and Swarming Phenomena

Nathalie Wehlitz, Grigorios A. Pavliotis, Christof Schütte, Stefanie Winkelmann

4. Non-trivial Statistical Effects of the Lotka-Volterra - Replicator Dynamics Mapping

Calina Durbac, Arne Traulsen

Thursday 23rd July

10:15–12:00 — Symposia

SM11 G01 Dynamics and persistence of internal evolutionary conflicts

Organisers: *Gaurav Athreya, Shikhara Bhat, E. Yağmur Erten*

1. How many routes exist to the emergence of an internal evolutionary conflict?

Gaurav Athreya, Shikhara Bhat, Arvid Ågren, Yagmur Erten, Thomas Keaney

2. X-linked meiotic drive can boost population size and persistence

Carl Mackintosh, Andrew Pomiankowski

3. A PDE Model for Protocell Evolution and the Origin of Chromosomes via Multilevel Selection

Daniel Cooney

4. A formal theory of group-level adaptation for obligate eusociality

Kalyani Twyman, Andy Gardner

SM12 G02 Theoretical developments in evolutionary game dynamics

Organisers: *Fabio Chalub, Mark Broom*

1. Dynamical compatibility for finite and infinite population models used in genetics

Fabio Chalub

2. Predator-dependent replicator dynamics or a predator-prey model with two prey types and frequency dependence

Armando Neves, Henrique Cruz

3. Stability and the survival of competing species

Sofia Castro

4. Multi-agent reinforcement learning through the lens of evolutionary game dynamics

Johann Bauer, Sheldon West, Eduardo Alonso, Mark Broom

SM13 G03 Sweeps, Clicks, and Scales: Models with selection and recurrent mutations

Organisers: *Anton Wakolbinger*

1. The accumulation of beneficial mutations and convergence to a Poisson process

Nantawat Udomchatpitak, **Jason Schweinsberg**

2. Logarithmic scaling of sweeps, and clonal interference in the Gerrish-Lenski regime

Felix Hermann, Florin Boenkost, Adrián González Casanova, Renato Soares dos Santos, **András Tóbiás**, Anton Wakolbinger

3. Towards the Rate of Muller's Ratchet

Carola Heinzel, Peter Pfaffelhuber, Anton Wakolbinger

4. Clicks (and sweeps) with tournament selection

Charline Smadi, **Anton Wakolbinger**

SM14 G04 Heterogeneity patterns in structured populations with and without selection

Organisers: *Cornelia Pokalyuk, Vianney Brouard*

1. **Spatial Pattern Formation and the Evolution of Cooperative Behavior**
Daniel Cooney
2. **Metacommunity persistence on spatially heterogeneous landscapes**
Madeleine Kubasch, Manon Costa, Nicolas Loeuille
3. **Extended power-law mutation regime in adaptive dynamics**
Vianney Brouard
4. **Selection of the fittest or selection of the luckiest: the emergence of Goodhart's law in evolution**
Zsófia Talyigás, Francesco Paparella, Bastien Mallein, Emmanuel Schertzer

SM15 G05 Mathematical Models in Cultural Evolution

Organisers: Patrick Lauer, Madeleine Ammar, Niccole Porras Alvarez, Alfredo Cortell-Nicolau

1. **Why cultural traits become cultural packages.**
Patrick Lauer, Anne Kandler, Laurel Fogarty
2. **Linking cultural rules to admixture outcomes**
Niccole Porras Alvarez, Laurel Fogarty, Anne Kandler
3. **Gene-culture association and coevolution – haploids and diploids**
Laurel Fogarty
4. **The coevolution of learning schedules and teaching enhances cumulative knowledge and drives a teacher-innovator syndrome**
Ludovic Maisonneuve, Laurent Lehmann, Charles Mullan

13:45–15:30 — Parallel Sessions

S16 G01 Cancer Evolution & Tumour Dynamics

1. **The evolutionary fitness landscape of extrachromosomal DNA in cancer**
Magnus Haughey, Benjamin Werner
2. **Investigating the emergence of growth patterns in colorectal cancer liver metastases through ecological modelling and spatial analysis**
Xiaoyuan Liu, Xiao Fu
3. **Radiotherapy as an evolutionary force: modeling phenotypic heterogeneity and treatment response in tumors**
Lara Schmalenstroer, Daniel Hoffmann, Russell Rockne, Farnoush Farahpour
4. **Mathematical Modelling of Stochastic Gene Expression Quantifies mRNA Heterogeneity in Cancer Cell Populations with Extrachromosomal DNA**
Poulami Somanya Ganguly, Weini Huang

S17 G02 Senescence, Ageing & Life History Theory

1. **A life history model of continuous growth and negative senescence with damage accumulation and maintenance**
Arttu Soukainen, Piret Avila
2. **Gompertzian mortality, selective disappearance, and apparent late-life plateaus from the first principles of stochastic failure accumulation**
Shikhara Bhat, Hanna Kokko
3. **When can hidden heterogeneity be ignored? Collapsing projection matrices while preserving population dynamics**
Amy Forsythe, Sarah Otto, Troy Day

4. **Extending Structured Population Models to Intermediate Group Organization**
Thomas Martin

S18 G03 Ecological Stability, Perturbations & Tipping Points

1. **Local negative frequency dependence can decrease global coexistence in fragmented populations**
Anush Devadhasan, Oana Carja
2. **Predicting the worst-case timing of multiple pulse perturbations**
James Orr, Alicia Williams, Yu-Pei Tseng, Michelle Jackson, Andrew Letten, Jean-François Arnoldi
3. **Biodiversity collapse in Ullswater? Modelling the population dynamics of a data-poor fishery**
Eilidh Thompson, Jon Pitchford, Brennen Fagan, Harrie Neal, Mo Verhoeven
4. **Geometric Conditions for the Global Stability and Mutuality in Ecosystems Driven by a Quadratic Growth Term**
Gustav Lindwall, Arne Traulsen

S19 G04 Evolutionary Dynamics of Gene Regulatory Networks

1. **Complexity as the by-product of sub-optimal evolutionary histories in multi-optima fitness landscapes**
Elliot Butterworth, Tim Rogers, Matthew Wills
2. **Evolution of Gene Regulatory Networks under Negative Frequency-Dependent Selection**
Ritam Das, Charles Mullan
3. **The Evolution of Phenotypic Heterogeneity in the Bacterial Flagellar Network: Biophysical Constraints and Mechanistic Epistasis**
Murat Tugrul

S20 G05 Social Evolution

1. **Social learning for population adaptation**
Dharanish Rajendra, Chaitanya Gokhale
2. **Evolution of informed dispersal strategies in trophic meta-communities**
Yuriy Pichugin, Corina Tarnita
3. **Co-evolution between inherited family reputations and reciprocal behaviours**
Miguel dos Santos, Hisashi Ohtsuki, Charles Mullan
4. **The coevolution of cooperation and socially-mediated dispersal under kin competition**
Iris Prigent, Charles Mullan

16:00–17:45 — Parallel Sessions

S21 G01 Population Genetics

1. **Analytical expectations for ancestry junction accumulation in admixed genomes**
Shirin Nataneli, Aydin Loid Karatas, Tessa Ferrari, Roshni Patel, Jazlyn Mooney
2. **A new twist to an old tale: A distance-space framework for inferring selection**
Sina Roshandel, Kamran Kaveh, Farnoush Farahpour
3. **Efficient inference of birth-death processes from site frequency spectra**
Tobias Dieselhorst, Marcus Overwater, François Bienvenu, Tanja Stadler
4. **Propagation of exchangeability and moment duality.**
Ariel Offenstadt, Adrian Gonzalez Casanova, Arno Siri Jégousse

S22 G02 Evolutionary Genetics & Ploidy

1. **The coevolution of sex and ploidy in haploid-diploid life cycles**
Carl Mackintosh, Denis Roze
2. **A mathematical synthesis of genetics, development, and evolution**
Mauricio González-Forero
3. **The effect of hybrid incompatibilities on a cline**
Julio A. Ayala-López, Stephan Peischl, Claudia Bank

S23 G03 Marine & Aquatic Ecosystem Modelling

1. **Mathematical Analysis of Alternative Formulations of a Three-component Mechanistic Model of Plankton Allelopathy and Species Competition**
Trisha Maitra, Shovonlal Roy
2. **Using a coupled hydrodynamic-particle tracking model to inform aquatic animal disease zoning**
Samuel Shute, Sophie Armitage, Claire Beraud, Jacob Harper, Mickael Teixeira Alves
3. **Predicting the impacts of anthropogenic N:P imbalances on greenhouse gas fluxes from lakes with synergistic metabolism between phytoplankton and methanotrophs**
Oliver Ward, Helen Kettle
4. **A semi-analytical inverse framework for retrieving phytoplankton abundance from satellite observations**
Shovonlal Roy

S24 G04 Trait Evolution & Selection Dynamics

1. **The evolutionary consequences of the geometry of adaptation**
Florian Labourel, Florence Bansept, David McCandlish
2. **Stochastic Eco-Evolutionary Dynamics of Multivariate Traits: A General Framework and Implications for G-Matrix Evolution**
Bob Week
3. **The evolution of mutualism from mutually beneficial common goods**
Lewis Flinham, Andrew Pomiankowski, Vincent Jansen

S25 G05 Evolution of Cooperation & Social Dynamics

1. **The effects of herding and dispersal behaviour on the evolution of cooperation on complete networks**
Mark Broom, Hasan Haq, Pedro Schimit
2. **Mind the Gaps: How the Spiral of Silence Could Drive Partisan Misperception in the United States Political System**
Daniel Levy, Yphtach Lelkes, Naomi Leonard, Corina Tarnita
3. **Survival Selection Promotes Cooperation on Dynamic Networks**
Jacob Chisauksy, Gerald Carter, Corina Tarnita

Friday 24th July

09:00–10:45 — Parallel Sessions

S26 G01 Microbial Population Dynamics

1. Unifying Bet-Hedging and Horizontal Gene Transfer: The Evolution of Bacterial Immunodeficiency in Fluctuating Environments

Emma ACACIA, Xavier Charpentier, Charles Coluzzi, Thomas Koffel, Samuel Venner, Rémi Tuffet

2. Maximizing the gut Shannon diversity via intermittent feeding

Vitor M. Marquioni, Ann-Cathrin Hofacker, Jocksan Villavicencio Villavicencio, Florence Bansept

3. Stories of migration and diversification in microbial populations experiencing a biphasic lifestyle

Florence Bansept, Leon Espinosa, Cécile Carrère

4. Spatial dynamics of a hybrid mathematical model describing the ecological transitions of the boreal forest ecosystem perturbed by fires

Guillaume Cantin, Adam Ali, Yves Bergeron, Dorian Gaboriau, Jonathan Lesven, Mathis Rouyn-Noranda, Québec, Sully Mak, Martin Girardin

S27 G02 Metabolic Ecology, Resource Allocation & Ecotoxicology

1. Energy allocation and fitness: using DEB theory to model metal-induced trade-offs in a sentinel species

Mélanie Debelgarric, Olivier Geffard, Juliette Dardé, Christelle Lopes

2. Optimizing the resource allocation between biochemical defence and counter-counter defence in pathogenic and trophic interactions.

Lukas Korn, Stefan Schuster

S28 G03 Applied Mathematical Biology

1. Mathematical Modelling of azo dye biodegradation

Ajay Minj

2. Modelling epidemiological and economic impacts of diseases in complex aquaculture production networks

Mickael Teixeira Alves, Sophie Armitage, Adam Kennerley, Jacob Harper, Mark Thrush

S29 G04 Data-Driven Methods & Machine Learning

1. Diffusion map based forecasting from eDNA abundance time series

Albertas Dvirnas

2. Combining reinforcement learning and simulation-based inference to disentangle the cognitive and behavioural mechanisms underlying selection-induced differences in a zebrafish inhibitory learning experiment

Valentin Lecheval, Tamal Roy, Robert Arlinghaus, Pawel Romanczuk

3. Mapping niches to trait abundance clusters using a more flexible clustering model

Satavisha De, Bahar Talebzadeh, Jin Lu, Annette Ostling

S30 G05 Population Dynamics: Ecology & Applied Models

1. How Biodiversity Metrics Change with Changing Habitats

Brennen Fagan, Inês S. Martins, Jon W. Pitchford, Chris D. Thomas

2. Beyond the damping ratio: Estimating species recovery time after disturbance using matrix population models

MacDara Allison, Kirk Soodhalter, Biswajit Basu, Nessa O'Connor

3. Law of large numbers for a growth-fragmentation-coagulation model

Elie Cerf, Coralie Fritsch, Denis Villemonais, Alex Watson