Evolutionary Transitions in Individuality Workshop (ETI2023)

Monday 22 May 2023 - Friday 26 May 2023

Scientific Programme

Participant Guidelines

Chalk Talks: Presentations are 20 minutes long, including time for discusting the promision 12 minutes talks and 6 minutes discussions, keeping 2 minutes for setup). We way provide a plackboard, chalks, pen and paper.

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Posters: The poster session is on Tuesday at 5pm, and the po discussion during coffee breaks. Posters should be in a A0-portrait for

Contact: Feel free to contact us at workshops@evolbio.mpg.de, doulciero b.bourrat@gmail.com.

Venue: The workshop will be held at the Max Planck Institute for Evolutionary Directions are available on the institute's website.

Walk and boat trip: We will have a short walk on the lake shore followed by a boat i estaurant on Wednesday evening. Please bring 6.50€ in cash to cover for the boat ticket. Farewell Barbecue: We will have a donation-based Farewell barbecue on Friday eveni meals and non alcoholic beverages are covered by the workshop. Offline: The workshop is made to host interactive chalk talks and discussion about

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Schedule

Monday

16:30 Beginning of the check-in

18:30 Dinner - Lecture hall

19:00 Introduction to the workshop

Tuesday

9:00 Welcome

9:10 Arne Traulsen Growth competition between life cycles characterized by fragmentation patterns

9:30 Peter Conlin On the entrenchment of multicellularity

9:50 **Daniel Cooney** A PDE model for protocell evolution and the origin of chromosomes via multilevel selection

10:10 **Joanna Summers** The evolution of developmental regulation in a simple multicellular life cycle

10:30 Coffee Break

11:00 Sylvain Charlat Evolution in the soup: Can natural selection precede individuation? Part 1

11:20 Etienne Rajon Evolution in the soup: Can natural selection precede individuation? Part 2

11:40 E. Yagmur Erten Cancer and evolutionary transition to multicellularity

12:00 Phillipe Huneman Ecosystems and agents as two sides of a transition

12:30 Lunch - Cafeteria

13:30 *Group Discussion* - ETI in the abstract: Individuality, Classification, Emergence 15:30 Coffee Break

16:00 General Discussion - ETI in the abstract: Individuality, Classification, Emergence

17:00 Poster Session - Lecture hall

18:30 Dinner - Seeprinz (Plön)

Wednesday

9:00 Welcome

9:10 **Tazzio Tissot** Synchronisation of decision behaviours and the transition from individual decisions to collective decisions

9:30 Richard Watson Higher-level individuality as a product of life-cycle synchronisation

9:50 **Konstantinos Alexiou** A Stochastic Multiscale Modelling Framework for the Evolution of Phenotype-Structured Cell Populations.

10:10 **Renske Vroomans** *Emergent reproductive strategies at the transition to multicellularity* 10:30 Coffee Break

11:00 Wenying Shou Inheritance of collective-level traits

11:20 **Jyotsna Kalathera** *Population bottlenecks drive the evolution of distinct life-history strategies in the populations of aggregative multicellular bacterium Myxococcus xanthus* 11:40 **Ellen Clarke** *Individuals in transition*

12:00 Paulien Hogeweg Who is more "Individual" ? Comparing three major transitions emerging in

constructive evolutionary computational experiments 12:30 Lunch - Cafeteria 13:30 Group Discussion - Diachronic view: Mechanisms of Initiation and Maintenance - Progress of an ETI 15:30 Coffee Break 16:00 General Discussion - Diachronic view: Mechanisms of Initiation and Maintenance - Progress of an ETI 16:20 Departure for Fegetasche 17:00 Boat Trip - Boat Pier Fegetasche 18:30 Dinner - Landgasthaus Kasch (Timmdorf bei Malente) Thursday 9:00 Welcome 9:10 James Griesemer Conceptualizing Dynamic Developmental Scaffolds 9:30 Rutger Hermsen Emergent multilevel and multiscale selection in a simple spatial model of the evolution of altruism 9:50 Enrico Sandro Colizzi Evolution of multicellular individuality in antibiotic-producing bacteria 10:10 Johannes Martens Darwinian indivisibility, egalitarian transitions and the 3-layered model 10:30 Coffee Break 11:00 Afra Salazar (How) Can we artificially manipulate individuality in multispecies communities? 11:20 Christian Kost Do obligate dependencies fuel transitions in individuality? 11:40 General Discussion 12:30 Lunch - Cafeteria 13:30 Group Discussion - Viewpoints on ETIs: Ecology, Development, Game Theory, Selection 15:30 Coffee Break 16:00 General Discussion - Viewpoints on ETIs: Ecology, Development, Game Theory, Selection 17:00 Wrap-up 18:00 Dinner - Brasserie am Schloss (Plön) Friday 9:00 Welcome 9:10 Simon van Vliet The role of multilevel selection in the evolution of microbial communities 9:30 Jordi van Gestel Microbial development 9:50 Jessica Flack Hourglass Emergence ee Break Discussion - The future of ETIs as a research field 2:30 Lunch - Cafeteria .3:30 Group Discussion - Toward a general theory of ETIs: Conditions, Quantification, Mo 15:30 Coffee Break 16:00 General Discussion - Toward a general theory of ETIs: Conditions, Quan n, Models 17:00 Wrap-up 18:30 Dinner - Barbecue at the Institute Poster session Bram van Dijk Spatial structure prevents the emergence of virulence in environmentally transmitted microbiomes orld in the Phyllosphere Laura Forero-Junco The ganization and evolutionary transition of individuality strategies for the evolution of a specialized bacteri Guilhem Panneau Microbiome, Gisela Rodriguez Short- and long-tel specialized bacteria life cycle Alejandra Ramirez Chaos and noise: disorder in population dynan Tuan Pham Double-replica theory for evolution of genotype-phenotype merrelations understand the interplay Nikil Sharma Evolutionary Graph Theory (EGT) aim selection and genetic drift in spatial structures. Nam Le The Role of Plasticity in the Emergence of New Levels **Biological Individua**

Group Discussions



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We have compiled and sorted the 50 questions about evolutionary transitions in individuality deemed the most pressing/interesting according **Societations survey** addressed to all participants of the workshop. They will be used as the starting point for the group discussions.