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S P I E L E
STOCHASTIC PROCESSES IN EVOLUTION AND ECOLOGY

Berlin – Frankfurt – Mainz – Warwick

LECTURE: „THE IMPACT OF DORMANCY ON EVOLUTIONARY BRANCHING"

SPEAKER: TOBIAS PAUL (HUMBOLDT UNIVERSITÄT ZU BERLIN)

TIME: MONDAY, 7.11.2022, 4 P.M. (CET)

THE LECTURE WILL BE HELD ONLINE

INTERESTED? YOU CAN GET THE LINK FROM PROF. BLATH

BLATH@MATH.UNI-FRANKFURT.DE

Dormancy mechanisms allowing individuals to enter and exit a protected state of reduced metabolic activity are ubiquituous in nature. Hence, we aim to understand the consequences of dormancy on evolutionary and ecological properties of microbial populations. In this talk, we will consider a stochastic individual-based model as proposed by Champagnat and Méléard (2011) where we incorporate competition-induced dormancy. To study the behaviour of the population over time, we derive the Polymorphic Evolution Sequence and the Canonical Equation of Adaptive Dynamics (CEAD) as scaling limits of the model. At the equilibria of the CEAD we may observe evolutionary branching, which describes the splitting of a population into distinct traits and may hence be understood as speciation. We will show a general criterion for evolutionary branching and demonstrate the effect of dormancy in a specific model. Using our mathematical tools and simulations, we also see an impact of dormancy on subsequent branchings, the speed of adaptation, species diversity and niche width.

This is a joint work with Jochen Blath, András Tóbiás and Maite Wilke Berenguer.