Cologne Evolution Colloquium

CRC 1310 Predictability in Evolution

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Environmental construction shapes microbial community assembly and evolution

Microbial ecologists have long known that microbes reconfigure their immediate environment as a result of their metabolic activity. My group is interested in understanding how these metabolic feedbacks between microbial growth and the environment drive microbial evolution and shape the assembly of microbial communities. Here I will discuss our work on both of these fronts. First, by cultivating large numbers of environmental communities *ex situ* in simple, synthetic environments, we have found that collective metabolic facilitation enables the assembly of rich and diverse communities on a single supplied limiting resource, whose broad taxonomic composition is widely predictable by the environment in spite of substantial variability at the sub-family level. These communities exhibit an emergent statistical structure that mimics widely reported properties of natural microbiomes, suggesting that these are generic properties of large self-assembled communities. On the evolutionary front, we have used empirically calibrated genome-wide metabolic models to study how eco-evolutionary feedbacks introduced by metabolic activity lead to the deformability of adaptive landscapes by evolving microbial populations.

Wednesday, March 07, 2018, 17:00
University of Cologne
Institute for Theoretical Physics
Seminar Room 0.02, Ground Floor

Hosted by
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