

Michael Manhart

ETH Zürich

## **Evolution of microbial growth dynamics**

The relationship between nutrient availability and growth rate is key to predicting the behavior of microbial ecosystems. I will show how evolutionary processes address two longstanding questions about the nutrient-growth relationship. 1) Should an organism's growth affinity for a nutrient be commensurate with that nutrient's environmental abundance, as implicitly assumed by many environmental studies? I will show this is invalid under certain modes of population dynamics, due to different environmental dependences of selection and genetic drift. This means that populations evolving in nutrient-rich environments can still have fast growth in nutrient-poor environments. 2) Are microbes colimited by multiple nutrients, as suspected in many aquatic environments? I will show that selection should indeed drive populations toward colimitation in general. When some of the nutrients are cross-fed between species, I will show how the evolved degree of colimitation corresponds to a balance between competition and cooperation between the species. Altogether these results demonstrate the importance of evolutionary processes in shaping fundamental aspects of microbial ecology.

Wednesday, October 26, 2022, 17:00  
Institute for Biological Physics Room 0.02

Hosted by Tobias Bollenbach