



---

Monday, 26 November 2018, Lecture Hall N24/H13, 16:15  
Coffee and cookies will be served in front of the lecture hall from 16:00

## **Evolutionary dynamics meets geometrical optics: How isolated features in the habitat shape genetic diversity during range expansions for long times and at large distances**

### **Dr. Wolfram Möbius**

Living Systems Institute  
University of Exeter



In nature, populations expand into new habitat at different spatial and temporal scales. The expansion process can thereby affect the evolutionary path of the growing population, a topic that gathered much interest recently. Despite many natural environments being heterogeneous, the effect of environmental heterogeneity on the evolutionary dynamics of such range expansions remains poorly understood so far - not least due to the large variety of environmental heterogeneity found in nature. We here address the effect of environmental heterogeneity or landscape structure using theory, simulations, and experiments - and thereby focus on individual, isolated structures and their effect at long times and large distances

In particular, we consider obstacles and hotspots, regions which hinder and accelerate the invasion, respectively, as well as bumps in an otherwise flat habitat. We find that those structures have characteristic effects on genetic diversity. We observe an additional layer of 'survival of the luckiest' – complementary to, yet qualitatively different from founder effects occurring in the presence of 'spatial bottlenecks'. Concepts known from geometrical optics provide a powerful framework to rationalize and characterize these effects and suggest a way to study the consequences of more complex large-scale structures.

