



UNIVERSITÄT LEIPZIG

Fakultät für Physik und
Geowissenschaften

Prof. Dr. M. Grundmann, Dekan

Fakultäts-Kolloquium

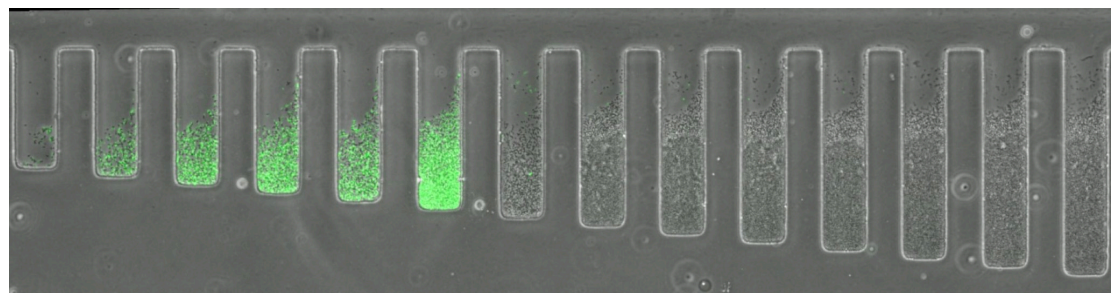
Dienstag, 1. November 2022, 17:00 Uhr

Prof. Dr. Oskar Hallatschek

Peter-Debye-Institut für Physik der weichen Materie, Universität Leipzig

Microfluidic Island Biogeography – Jam and Conquer –

Microbes often colonize spatially-constrained habitats, such as pores in the skin or crypts in the colon. The resulting micro-communities can be very stable and contribute to the long-term function of our microbiomes. Due to a lack of spatio-temporal observations, it is however unclear how these communities and their ecological functions arise. Using microfluidic devices to systematically vary ecological correlation lengths, we uncover sharp transitions between different colonization states with different evolutionary properties. Our results show that density-dependent passive diffusion can drive reproducing populations to a jamming threshold, which entails supreme resilience against invaders at the cost of a total loss of mixing and intra-species competition. These results elucidate how cell proliferation can drive unique non-equilibrium phase transitions (different from MIPS). The emerging sensitivity to scale, foreshadowed in the field of island biogeography, underscores the need to control for scale in microbial eco-evolutionary experiments.



**Hörsaal für Theoretische Physik,
Linnéstraße 5, 04103 Leipzig**

**Alle Teilnehmer sind ab 16:30 Uhr zu Kaffee vor dem Hörsaal sowie
im Anschluss an den Vortrag zu einem Empfang in der Aula eingeladen.**