



Fakultät für Biologie
Institut für Mikrobiologie

Einladung zum Special Seminar

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"The Third Mode of Life"

Fungi cause major crop devastation on a global scale, exacerbated by climate change with long-term knock-on consequences for food security. However, fungi also provide critical ecosystem services through extensive carbon and nutrient cycling in the soil. Despite the difference in global impact, these different fungi share a unique growth form as an interconnected filamentous network. We are investigating how such indeterminate systems can form adaptive networks with both high transport capacity and resilience to attack, but at relatively low cost, and without any centralised control system. We have developed combined imaging and modelling approaches to characterize the network structure, link the structure to predicted nutrient transport, based on models of fluid flow dynamics, and then test these predictions using experimental measurement of nutrient flows using photon-counting scintillation imaging. We have also explored control of network development in the acellular slime mold, *Physarum polycephalum*, which is taxonomically completely unrelated to the network forming fungi, being essentially a single giant animal cell, yet appears to exemplify common solutions to self-organised adaptive network formation driven by fluid flows, local rules and oscillatory behavior. In contrast to single celled organisms and other multicellular organisms, we propose that networked organisms constitute a 'Third Mode of Life' in which complex behaviour emerges as a result of iterative local rules running on intrinsically coupled, adaptive networks with a distributed processing architecture.

Zeit: Freitag, 19.05.2017, 11:00 Uhr

Ort: Seminarraum Mikrobiologie (1. OG), Technikerstraße 25d