Physikalisches Kolloquium

Universität Konstanz

Festkolloquium für
Prof. Dr. Clemens Bechinger

Di 10.01.23
15:15 Uhr
R 513
Im Anschluss Sektempfang

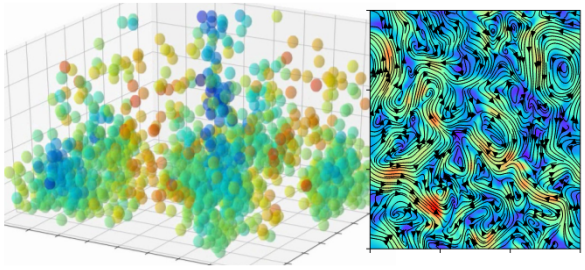
Prof. Dr. Holger Stark
TU Berlin

Dry and wet active matter: Exploring the non-equilibrium

Active matter consists of constituents that consume energy in order to self-propel. It can be found in different environments and, in particular, in the microscopic world of micro-organisms and artificial microswimmers, where inertia is negligible. The talk illustrates how the non-equilibrium determines the behavior of active matter.

In dry active matter the frictional coupling to the surrounding is described by a friction coefficient. We use the paradigmatic system of active Brownian particles to discuss how active Szilard engines use information to perform work and explore the unusual dynamic properties of an active bath using microrheology.

Microswimmers initiate hydrodynamic flow fields in their aequous environment through which they interact. For this wet active matter, we performed numerical simulations with the method of multi-particle collision dynamics, where we investigate the collective dynamics of spherical and elongated model microswimmers. Depending on the neutral or pusher/puller swimmer type, they exhibit a variety of fascinating emergent collective dynamics, including plumes, convective rolls, and active turbulence.



Host: Prof. Leitenstorfer

Organisation: Prof. Bechinger