



UNIVERSITÄT
LEIPZIG

Fakultät für Physik und
Erdsystemwissenschaften

Prof. Dr. J. Deiglmayr
Prof. Dr. I. Sodemann

Physics Colloquium

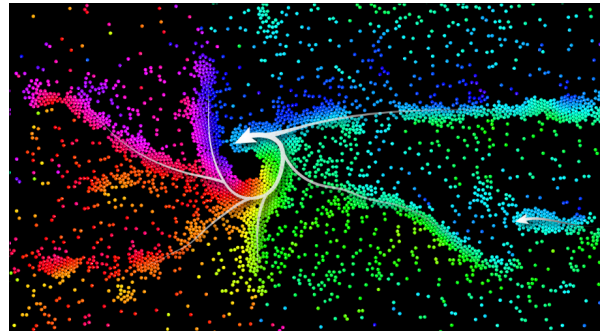
Tuesday, 2 July 2024 at 16:30

Prof. Dr. Erwin Frey

Ludwig-Maximilians-Universität / Max Planck School Matter to Life, München

From Flocks to Foams and Soft Robotics

Active matter has emerged as a fundamental paradigm for studying non-equilibrium systems, offering a dynamic platform to explore the principles of self-organization, phase behavior, and pattern formation. Encompassing a wide array of systems ranging from natural phenomena like animal swarms to artificial constructs such as self-moving colloids or robots, as well as active liquids or solids, active matter unveils novel forms of matter. These include phenomena like polar flocks, motility-induced phase separation, the coexistence of phases with different types of order, and the emergence of supramolecular structures like active foams.



In this talk, I will present recent progress in understanding the emergence of these collective phenomena based on a combination of experiments, agent-based simulations, and active field theories. In particular, I will discuss how symmetry emerges as a collective phenomenon in active systems and how novel macroscopic laws can be found that extend the laws found in thermodynamic equilibrium systems. I will also discuss the potential of chemical and acoustic communication between active agents to contribute to the emergence of adaptive, multifunctional collective structures with basic cognitive capabilities at the system level.

Venue: Universität Leipzig, Faculty of Physics and Earth Sciences
04103 Leipzig, Linnéstraße 5, Small Lecture Hall

Everyone is welcome to a reception with coffee, drinks and cookies in the Aula following the talk.

For an up-to-date semester program, sign-up for the physics colloquium mailing list, and subscription to the digital calendars in CalDAV format, head to the colloquiums web page <https://www.physes.uni-leipzig.de/fakultaet/veranstaltungen>.

