

Sommersemester 2026

Dresdner Mathematisches Seminar

Prof. Dr. Maria Bruna

University of Oxford, Mathematical Institute

Macroscopic limits of active matter systems

Active matter systems consist of large collections of self-propelled particles and arise in a wide range of biological and physical contexts, including bird flocks, fish schools, and bacterial suspensions. Unlike passive systems, such particles can exhibit phase separation even in the absence of attractive interactions – a phenomenon known as motility-induced phase separation.

In this talk, I will introduce stochastic particle models for active matter, focusing on systems of interacting active Brownian particles subject to purely repulsive forces. I will then discuss several approaches to deriving macroscopic descriptions in the form of partial differential equations. Finally, I will present results on the stability and analytical properties of one such macroscopic model.

Mittwoch, 15.07.2026, 17:00 Uhr – Willers-Bau, Raum A 124

Leitung: Jun.-Prof. Dr. Markus Schmidtchen

Vor dem Vortrag findet **ab 16:30 Uhr** ein gemeinsames **Kaffee-/Teetrinken** vor dem Vortragsraum WIL A 124 statt.

Stand: 05.05.2026

Bereich Mathematik und Naturwissenschaften

Fakultät Mathematik