

# The Swim Pressure of Active Matter

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## Abstract

A distinguishing feature of many living systems is their ability to move—to be active. Through their motion living systems are able self-assemble: birds flock, fish school, bacteria swarm, etc. But such behavior is not limited to living systems. Recent advances in colloid chemistry have led to the development of synthetic, nonliving particles that are able to undergo autonomous motion by converting chemical energy into mechanical motion and work. This intrinsic activity imparts new behaviors to active matter that distinguish it from equilibrium systems. Active matter generates its own internal stress, which can drive it far from equilibrium, and by so doing active matter can control and direct its own behavior and that of its surroundings. In this talk I will discuss our recent work on active matter and on the origin of a new source of stress that is responsible for self-assembly and pattern formation in active matter systems.

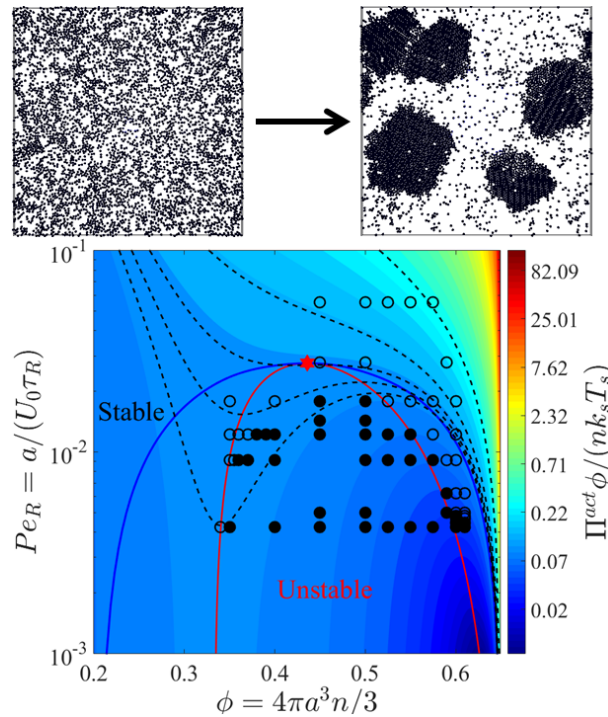


Figure 1: Athermal phase separation of active matter. (Adapted from Takatori & Brady *PRE* (2015).)