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Active matter model of Myxococcus xanthus aggregation ADAM PATCH, Department of Physics, Syracuse University, FATMAGUL BAHAR, Department of Biology, Syracuse University, GUANNAN LIU, Department of Physics, Princeton University, SHASHI THUTUPALLI, Department of Physics, Princeton University; Lewis-Sigler Institute for Integrative Genomics, Princeton University, ROY WELCH, Department of Biology, Syracuse University, DAVID YLLANES, Department of Physics, Syracuse University, JOSHUA SHAEVITZ, Department of Physics, Princeton University; Lewis-Sigler Institute for Integrative Genomics, Princeton University, M. CRISTINA MARCHETTI, Department of Physics, Syracuse University; Syracuse Biomaterials Institute, Syracuse University — *Myxococcus xanthus* is a soil-dwelling bacterium that exhibits several fascinating collective behaviors including streaming, swarming, and generation of fruiting bodies. A striking feature of *M. xanthus* is that it periodically reverses its motility direction. The first stage of fruiting body formation is characterized by the aggregation of cells on a surface into round mesoscopic structures. Experiments have shown that this aggregation relies heavily on regulation of the reversal rate and local mechanical interactions, suggesting motility-induced phase separation may play an important role. We have adapted self-propelled particle models to include cell reversal and motility suppression resulting from sporulation observed in aggregates. Using 2D molecular dynamics simulations, we map the phase behavior in the space of Péclet number and local density and examine the kinetics of aggregation for comparison to experiments.

Adam Patch
Department of Physics, Syracuse University

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