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Surprises in the nonequilibrium self-organization of active Janus particles JIE ZHANG, JING YAN, STEVE GRANICK, University of Illinois at Urbana-Champaign — As a minimal model of natural active matter and nonequilibrium system, self-propelled colloidal particles are excellent for the study of collective behavior that is common in biological systems spanning from mesoscopic to macroscopic scales, such as swarming, pattern formation and anomalous fluctuations. Here we use induced-charge electrophoretic (ICEP) Janus particles to show experimentally that self-propelled active colloidal particles can display macroscopic phase aggregation despite only particle-particle repulsion in this system. The evolution of the active dense phase grows with time following a power law of 1/2. Strikingly, this agrees with the attachment-detachment coarsening mechanism of phase separation systems at thermodynamic equilibrium.

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