ABSTRACT:

There is growing interest in biological aggregation phenomena as a possible design paradigm for artificial swarms. We consider a family of models used to study aggregation phenomena in which nonlocal interactions lead to motion that can also involve internal self propulsion. We discuss the role of H-stability, defined for conservative particle systems, as a measure of how the energy of the system per particle scales with the number of particles, applied to nonconservative particle systems with self-propulsion and drag. We also consider a family of kinematic models for continuum aggregation. For such systems we discuss nonlinear pattern formation and a proof of finite time blowup of solutions in the case of a common biological interaction kernel.

The talk will include some discussion of the papers listed below, available on my website: www.math.ucla.edu/~bertozzi


