1108-49-571 **Katy Craig*** (kcraig@math.ucla.edu) and **Ihsan Topaloglu**. *Regularization and convergence of nonlocal interaction energies.*

A variety of physical and biological processes—from self-assembly of nano particles to biological swarming—can be modeled as particles moving to minimize a nonlocal interaction energy. Often, the interaction between particles is chosen to scale according to a repulsive-attractive power-law potential, which causes rich patterns to develop. However, in general, these energies are neither convex nor differentiable, placing them outside the scope of most existing results on energy minimization and gradient flow.

In this talk, I will present recent work with Ihsan Topaloglu, in which we restore convexity and differentiability by regularization and prove that the regularized energies Gamma converge to the original energy. This provides further theoretical justification for the success of the numerical blob method, developed in previous work with Andrea Bertozzi. It also links the well-understood case of convex minimization and gradient flow with emerging results in the non-convex case, including ongoing work with Inwon Kim and Yao Yao. (Received January 20, 2015)