José Antonio Carrillo, Katy Craig* (kcraig@math.ucsb.edu) and Francesco Patacchini. A Blob Method for Diffusion.

For a range of physical and biological processes, from biological swarming to dynamics of granular media, the evolution of a large number of interacting agents can be described in terms of the competing effects of drift, diffusion, and nonlocal interaction. The resulting partial differential equations are gradient flows with respect to the Wasserstein metric. This gradient flow structure provides a natural framework for numerical particle methods. However, developing deterministic particle methods for problems involving diffusion poses unique challenges, particularly when nonlocal interaction terms are also present. In this talk, I will present new work on a blob method for diffusion and degenerate diffusion, inspired by blob methods from classical fluid mechanics. This is joint work with Francesco Patacchini and José Antonio Carrillo. (Received September 04, 2017)