1135-49-434 **Katy Craig*** (kcraig@math.ucscb.edu). *Gradient flow in the Wasserstein metric.*
For a range of partial differential equations–including the porous medium equation, the Fokker-Planck equation, and the Keller-Segel equation—solutions of the equations can be characterized as gradient flows with respect to the Wasserstein metric on the space of probability measures. This gradient flow structure lies at the heart of many recent analytic and numerical results, particularly regarding questions of stability, uniqueness, and singular limits.

Gradient flows with respect to Hilbert space norms have a long tradition in partial differential equations, but the geometry of the Wasserstein metric presents new challenges. First, even for probability measures on Euclidean space, the Wasserstein metric it is positively curved in dimensions higher than one. Second, the metric lacks a rigorous Riemannian structure, which one would normally use to make sense of the "gradient" in a "gradient flow". In this talk, I will introduce a time discretization of the gradient flow problem, due to Jordan, Kinderlehrer, and Otto, by which these problems can be overcome and present new results which extend the convergence of the time discrete scheme to a new class of partial differential equations of applied interest. (Received September 02, 2017)