1067-35-1393   **Jacob Philip Bedrossian*** (`jacob.bedrossian@math.ucla.edu`), 3670 Glendon Ave, #229, Los Angeles, CA 90034. *Global existence for aggregation equations and Patlak-Keller-Segel models with degenerate diffusion.*

There is a wide interest in aggregation phenomenon modeling the competition between dispersal and nonlocal self-attraction. Well-studied examples are the parabolic-elliptic Patlak-Keller-Segel models (PKS) for chemotaxis. Similar models with less singular nonlocal interaction are studied as models for group formation in ecological systems, where degenerate diffusion is often used to account for over-crowding effects. Traditionally, PKS is studied with linear diffusion, however recently there has been increased interest in models with degenerate diffusion. In the recent work undertaken by my collaborators and I, we unify and extend the local and global wellposedness theory of these two kinds of models by studying general nonlocal aggregation equations with degenerate diffusion. Among other things, we generalize the traditional notion of criticality and the critical mass is estimated for a number of models. In particular, we show that the global existence is only governed by the asymptotic singularity of the interaction kernel at the origin and the growth of the diffusion at high concentrations. In my talk, I will discuss the global existence theory, and if time permits, the uniqueness of weak solutions and more recent developments. (Received September 20, 2010)