

1116-35-816

**Alexander Kiselev** and **Xiaoqian Xu\*** ([xxu@math.wisc.edu](mailto:xxu@math.wisc.edu)). *Mixing versus chemotaxis.*

In this talk, we will consider parabolic-elliptic Keller-Segel equation in two and three dimensions with additional advection term modeling ambient fluid flow. Keller-Segel equation is one of the most studied PDE models of processes involving chemical attraction, for instance, the movement of bacteria. However, solution of Keller-Segel equation can exhibit dramatic collapsing behavior, where the population density of bacteria concentrates positive mass in a measure zero region. In other words, when the fluid flow is absent, there exist initial data leading to finite time blow up. Here we will prove that for any initial data, there exist incompressible fluid flows such that the solution to the equation stays globally regular. Thus presence of fluid can prevent the singularity formation. We will discuss two classes of flows that have the explosion arresting property. Both classes are known as very efficient mixers. (Received September 13, 2015)