1077-35-1765   **Jiahong Wu*** (`jiahong@math.okstate.edu`), Department of Mathematics, 401 Mathematical Sciences, Oklahoma State University, Stillwater, OK 74078. *The surface quasi-geostrophic and related equations.*

Fundamental issues such as the global regularity problem concerning the surface quasi-geostrophic (SQG) and related equations have attracted a lot of attention recently. Signicant progress has been made in the last few years. This talk summarizes some current results on the critical and supercritical SQG equations and presents very recent work on the generalized SQG equations. These generalized equations are active scalar equations with the velocity fields determined by the scalars through general Fourier multiplier operators. The SQG equation is a special case of these general models and it corresponds to the Riesz transform. We obtain global regularity for equations with velocity fields logarithmically singular than the 2D Euler and local regularity for equations with velocity fields more singular than those corresponding to the Riesz transform. The results are from recent papers in collaboration with D. Chae and P. Constantin, and with D. Chae, P. Constantin, D. Cordoba and F. Gancedo. (Received September 20, 2011)