

Meeting: 1001, Evanston, Illinois, SS 6A, Special Session on Nonlinear Partial Differential Equations and Applications

1001-35-37 **Ning Ju***, Department of Mathematics, 401 Mathematical Sciences, Oklahoma State University,
Stillwater, OK 74078. *2D Quasi-Geostrophic Equations.*

The 2D Quasi-Geostrophic equations (QGEs) and its dissipative form are simplified models of the general QGEs for the atmosphere and ocean flow with small Rossby and Ekman numbers. These models are proposed by Professors Constantin, Majda and Tabak as low dimension models for the mathematical study of (possible) singularity development in the 3D Euler and Navier-Stokes equations. This is due to the fact of remarkable mathematical resemblance of 2D QGEs with 3D Euler and Navier-Stokes, though the 2D QGEs enjoys some different properties as well. Recently, much interesting progress has been made in the mathematical study of 2D QGEs. However, still many important basic problems remain open. In this talk, we will give a brief review on the existing main results and will present some recent and new results of author's. We will focus mainly on the dissipative 2D QGEs. (Received July 07, 2004)