1001-76-423   **Jonathan C Mattingly*** (jonm@math.duke.edu), Department of Mathematics, Duke University, Durham, NC 27708, and **Etienne Pardoux** and **Martin Hairer**. *Ergodicity of the degenerately forced Stochastic Navier–Stokes Equations.*

I will discuss some recent results showing that the stochastically forced two–dimensional Navier–Stokes equation is ergodic when only a few degrees of freedom are forced. The required condition is essentially sharp and reflects the structure of an algebra of commutators associated with the nonlinearity. The result rests on an infinite dimensional generalization of Hörmander's "sum of squares" theorem. The proof uses a generalization of the strong Feller property and explicit calculations using Malliavin calculus in a infinite dimensional setting. I will also discuss the existence of strictly positive smooth densities for the finite dimensional marginals of the transition probabilities. (Received September 01, 2004)