1049-76-45 **Peter Constantin** and **Gautam Iyer*** (gi1242@stanford.edu), Mathematics Bldg. 380, 450 Serra Mall, Stanford, CA 94305, and **Jonathan C. Mattingly** and **Alexei Novikov**. *Stochastic Lagrangian Particle systems for the Navier-Stokes and Burgers equations.*

I will introduce an exact stochastic representation for certain non-linear transport equations (e.g. 3D-Navier-Stokes, Burgers) based on noisy Lagrangian paths, and use this to construct a (stochastic) particle system for the Navier-Stokes equations. On any fixed time interval, this particle system converges to the Navier-Stokes equations as the number of particles goes to infinity.

Curiously, a similar system for the (viscous) Burgers equations shocks in finite time, and solutions can not be continued past these shocks using classical methods. I will describe a resetting procedure by which these shocks can (surprisingly!) be avoided, and thus obtain convergence to the viscous Burgers equations on long time intervals. (Received February 13, 2009)