1053-76-230 **Peter Constantin** and **Gautam Iyer*** (gautam@math.cmu.edu), Dept. of Math. Sci, Room 6113, Wean Hall, Carnegie Mellon University, Pittsburgh, PA 15213, and **Jonathan 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. Time permitting I will discuss the analogue in bounded domains. (Received September 05, 2009)