Analysis and Applied Mathematics Seminar

Explosion in stochastic cascades and well-posedness for the 3D Navier-Stokes equations

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Abstract: The idea of re-casting existence and uniqueness for a mild formulation of the Navier-Stokes equations in terms of multiplicative stochastic processes (cascades) goes back to Le Jan and Sznitman work in the 1990's. In this talk I will address these cascades in the scaling-invariant setting, showing that the process develops infinitely many branches in finite time — a phenomenon called explosion. In previous work, explosion presented an obstacle in establishing uniqueness of the solutions. Nevertheless, we can show that both existence and uniqueness hold for small initial data. I will conclude by discussing possible implications of explosion to the problem of uniqueness of the solutions with large initial data.

Monday, September 25 at 4:00 PM in SEO 636