1085-60-65 **Bjorn Birnir*** (birnir@math.ucsb.edu), Dept. of Math, Univ. of California, Santa Barbara, Santa Barbara, CA 93117. *The Kolmogorov-Obukhov Statistical Theory of Turbulence.*

In 1941 Kolmogorov and Obukhov proposed that there exists a statistical theory of turbulence that should allow the computation of all the statistical quantities that can be computed and measured in turbulent systems. These are quantities such as the moments, the structure functions and the probability density functions (PDFs) of the turbulent velocity field. In this talk we will outline how to construct this statistical theory from the stochastic Navier-Stokes equation. The additive noise in the stochastic Navier-Stokes equation is generic noise given by the central limit theorem and the large deviation principle. The multiplicative noise consists of jumps multiplying the velocity, modeling jumps in the velocity gradient. We first estimate the structure functions of turbulence and establish the Kolmogorov-Obukhov '62 scaling hypothesis with the She-Leveque intermittency corrections. Then we compute the invariant measure of turbulence writing the stochastic Navier-Stokes equation as an infinite-dimensional Ito process and solving the linear Kolmogorov-Hopf functional differential equation for the invariant measure. Finally we project the invariant measure onto the PDFs. (Received August 29, 2012)