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Yu Gu* (yg@math.stanford.edu) and **Jean-Christophe Mourrat**. *Scaling limits of fluctuations in stochastic homogenization.*

Equations with small scales abound in physics and applied science. When the coefficients vary on microscopic scales, sometimes we expect local fluctuations to average out and the coefficients have some equivalent homogeneity on large scales. The goal of homogenization is to find an equivalent homogeneous media to replace the heterogeneous one with small effects on the solutions. In this talk, I will try to explain some probabilistic approaches we use to obtain the first order fluctuations in stochastic homogenization. The main ingredients include the invariance principle of a diffusion in random environment, the Helffer-Sjöstrand covariance representation and the Stein's method. (Received January 03, 2016)