1116-35-186   **Xiaoxia Xie*** (`xxie12@iit.edu`), Department of Applied Mathematics, Illinois Institute of Technology, Chicago, IL 60616, **Wenxian Shen** (`wenxish@mail.auburn.edu`), Department of Mathematics, Auburn University, Auburn, AL 36849, **Jinqiao Duan** (`duan@iit.edu`), Department of Applied Mathematics, Illinois Institute of Technology, Chicago, IL 60616, and **Xiaofan Li** (`lix@iit.edu`), Department of Applied Mathematics, Illinois Institute of Technology, Chicago, IL 60616. *Two Types of Nonlocal Diffusions and the Convergence to the Random/Normal Diffusion.*

This talk is concerned with the study of different types of diffusions: the random/normal diffusion and two types of nonlocal diffusions. The random/normal diffusion is the classical Laplace operator, while one type of nonlocal diffusions is an integral operator with a smooth kernel, and the other one is called the anomalous diffusion generated by the fractional Laplace operation.

Regarding the nonlocal dispersal operator with a smooth kernel, we first study its principal spectral theory and asymptotic dynamics. Secondly, we consider its convergence to the random dispersal operator from three points of view.

About the anomalous diffusion, we are interested in the Fokker-Plank equation, when the noise in the system is an α-stable Lévy motion. We investigate the existence, uniqueness, and regularity of solutions to the corresponding Fokker-Plank equation in two prototypical stochastic systems. (Received August 11, 2015)