1090-60-8 **Amarjit Budhiraja**, **Jiang Chen*** (jiangc@live.unc.edu) and **Paul Dupuis**. *Large Deviations for Stochastic Partial Differential Equations Driven by a Poisson Random Measure.*

Stochastic partial differential equations driven by Poisson random measures (PRM) have been proposed as models for many different physical systems. A systematic framework for the study of probabilities of deviations of the stochastic PDE from the deterministic PDE is through the theory of large deviations. The goal of this work is to develop the large deviation theory for small Poisson noise perturbations of a general class of deterministic infinite dimensional models. Although the analogous questions for finite dimensional systems have been well studied, there are currently no general results in the infinite dimensional setting. This is in part due to the fact that in this setting solutions may have little spatial regularity, and thus classical approximation methods for large deviation analysis become intractable. The approach taken here, which is based on a variational representation for nonnegative functionals of general PRM, reduces the proof of the large deviation principle to establishing basic qualitative properties for controlled analogues of the underlying stochastic system. As an illustration of the general theory, we consider a particular system that models the spread of a pollutant in a waterway. (Received March 02, 2013)