1099-35-387 **Mickaël D. Chekroun**, Department of Atmospheric & Oceanic Sciences, University of California, Los Angeles, CA 90095, **Honghu Liu***, Department of Atmospheric & Oceanic Sciences, University of California, Los Angeles, CA 90095, and **Shouhong Wang**, Department of Mathematics, Indiana University, Bloomington, IN 47405. *Non-Markovian Reduced Equations for Stochastic PDEs.*

In this talk, a new approach to deal with the parameterization problem of the "small" scales by the "large" ones for stochastic partial differential equations will be discussed. This approach relies on stochastic parameterizing manifolds (PMs) which are random manifolds aiming to provide—in a mean square sense—approximate parameterizations of the small scales by the large ones. Backward-forward systems will be introduced to give access to such PMs as pullback limits depending—through the nonlinear terms—on the time-history of the dynamics of the low modes. It will be shown that the corresponding pullback limits can be efficiently determined in practice, leading in turn to an operational procedure for the derivation of non-Markovian reduced equations able to achieve good modeling performances. A stochastic Burgers-type equation will serve to illustrate that the memory effects conveyed by such reduced systems play a key role to capture noise-induced transitions or large excursions caused by the noise. This talk is based on a joint work with Mickaël D. Chekroun (UCLA & Univ. of Hawaii at Manoa) and Shouhong Wang (IU). (Received February 11, 2014)