1108-92-546 **Weishi Liu*** (wsliu@ku.edu), University of Kansas, 1460 Jayhawk Blvd., Snow 405, Lawrence, KS 66045. *A geometric framework for analyzing Poisson-Nernst-Planck systems and applications to ion channel problems.* Preliminary report.

In this talk, we will briefly review a dynamical system framework for analyzing Poisson-Nernst-Planck (PNP) type systems, mainly in the content of ionic flow through membrane channels. The framework relies on a combination of a *general theory* of geometric singular perturbations and of *specific structures* of PNP type systems. An unusual advantage of this framework is that it often provides detailed and robust information on solutions, and in turn, it allows one to obtain concrete characteristics of solutions that have direct implications to ionic flow properties. As applications of this framework, a number of meaningful results obtained with my collaborators will be discussed. (Received January 20, 2015)