1106-35-844 **Junping Shi*** (jxshix@wm.edu), Department of Mathematics, College of William and Mary, Williamsburg, VA 23187. *Steady state solutions of a reaction-diffusion system modeling an autocatalytic chemical reaction with decay.*

Autocatalytic chemical reactions have been identified as one of main nonlinear mechanisms in biochemical procedures. In this talk, the dynamics and steady state solutions of an autocatalytic chemical reaction model with decay in the catalyst are considered. Nonexistence, existence and multiplicity of nontrivial steady state solutions are shown by using energy estimates, upper–lower solution method, bifurcation theory and topological degree theory. The effects of decay order, decay rate and diffusion rates to the dynamical behavior are discussed. This is a joint work with Zhao Yuhua, Wang Yuwen (Harbin Normal University), Zhou Jun (Southwest University). (Received September 07, 2014)