1135-93-327 **Martin G. Vieten*** (mgvieten@uwm.edu) and **Richard H. Stockbridge**. *Linear Programming Formulations for Singular Stochastic Control Problems with A Focus on Numerical Policy Evaluation.* Preliminary report.

Infinite-dimensional linear programming formulations for occupation measures of singular stochastic processes have been extensively studied by Stockbridge, Kurtz et al. Their equivalence to control problems posed by relaxed martingale problem formulations has been shown and has been instrumental in finding analytic solutions to a line of singular stochastic control problems.

Recent research focused on establishing a numerical method solving infinite-dimensional linear programs using approximation techniques borrowed from finite element theory. In particular, a certain type of discretization of the relaxed controls was proposed, and its asymptotic optimality was shown using weak convergence arguments.

This talk introduces the linear programming approach and outlines the main results for the proof of the asymptotic optimality of the proposed numerical approximation. Then, it presents how the linear programming formulations can be used to evaluate the cost criterion of an arbitrary, not necessarily optimal control. An existence and uniqueness argument is derived from approximate inversions of the infinitesimal generators and classic arguments from measure theory. The performance of the numerical approximation is illustrated with an example of stochastic logistic growth. (Received August 24, 2017)