

# 北京师范大学 随机数学研究中心

## 学术报告

报告人: 杨叙 (北方民族大学)

题目: On the extinction-extinguishing dichotomy for a stochastic Lotka-Volterra type population dynamical system

时间: 2022 年 5 月 23 日 (周一) 下午 3:30-4:30

地点: 腾讯会议号 181 640 282

**摘要:** Applying the Foster-Lyapunov type criteria and a martingale method, we study a two-dimensional process  $(X, Y)$  arising as the unique nonnegative solution to a pair of stochastic differential equations driven by independent Brownian motions and compensated spectrally positive Lévy random measures. Both processes  $X$  and  $Y$  can be identified as continuous-state nonlinear branching processes where the evolution of  $Y$  is negatively affected by  $X$ . Assuming that process  $X$  extinguishes, i.e. it converges to 0 but never reaches 0 in finite time, and process  $Y$  converges to 0, we identify rather sharp conditions under which the process  $Y$  exhibits, respectively, one of the following behaviors: extinction with probability one, extinguishing with probability one or both extinction and extinguishing occurring with strictly positive probabilities. This talk is based on a joint work with Yan-Xia Ren, Jie Xiong and Xiaowen Zhou.