

数学与系统科学研究院

计算数学所学术报告

报告人: **Prof. Zhijun Wu**

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报告题目:

**Optimality, Stability, and
Complexity of
Symmetric Evolutionary Games**

邀请人: 袁亚湘 院士

报告时间: **2014 年 6 月 17 日 (周二)**

下午 15:30-16:30

报告地点: **科技综合楼三层 311**

计算数学所报告厅

Abstract:

Evolutionary game theory has been applied successfully to modeling evolution of various biological or social systems, ranging from virus infection to bacteria development, from plant succession to animal breeding, and from trace of evolutionary history to study of biodiversity and ecology. In this theory, species are considered as if they are players in a game, competing for resources, for survival, and for reproduction. A mathematical (game) model can then be established for study of any given population of competing species, for analysis of population changes, and for prediction of equilibrium states and their stabilities.

In this talk, I will focus on a special class of evolutionary games called symmetric evolutionary games and discuss the optimality and stability conditions of their solutions. Such games have important applications in population genetics where they can be used to model the inheritance of genotypes when their corresponding phenotypes are under selection pressures. I will show that their solutions can be obtained by solving a related class of optimization problems called generalized knapsack problems. A set of first- and second-order optimality and stability conditions can thus be derived. Applications to a special class of genetic selection games including a game for genetic mutations for malaria resistance will also be demonstrated.

欢迎大家参加!