The Dr. W.F. James Chair of Studies in the Pure and Applied Sciences Public Lecture

Presented by:

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An Introduction to Evolutionary Games and to Game Experiments on Cooperation through Reward and Punishment

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7:00 pm – 8:30 pm
Schwartz School of Business, Room 205

Abstract: Classical game theory predicts human behavior in conflict situations such as competition among firms as well as interactions among nations or among individuals. After a brief discussion of the classical approach, we concentrate on evolutionary games which began some forty years ago when John Maynard Smith introduced the concept of an evolutionarily stable strategy (ESS) to predict the behavior of individuals in a biological population. The first half of the talk gives an overview of this development from its initial use by biologists in the 1970s/80s to some of its current applications to extensive form games (e.g. the Chain Store Game) and games with continuous strategy spaces (e.g. the War of Attrition). Conditions for stability of the evolutionary outcome under game dynamics such as the replicator equation are shown to be closely related to the ESS and other static solution concepts.

The second half of the talk reports on game experiments investigating the evolution of cooperation. That players cooperate even when it is in their own best interest not to has long been a puzzle to game theorists. Our empirical data from experiments based on the two-player Prisoner's Dilemma (PD) game and the four-player Public Goods Game (PGG) show that cooperation levels are influenced by cultural norms and by a combination of conforming and reactive behaviors. In particular, institutional reward/punishment incentives in PGG can be used to model mechanisms to promote cooperation among stakeholders on environmental issues.