Department of Mathematical Sciences
Sabbatical Presentation

"Game Theory as a Tool for Market Design: The Case of the Digital and Green Economies"
Dr. Zhixin Yang

Thursday, October 16
1:00-1:50 p.m.
RB 450

Abstract:

This talk explores how game theory serves as a practical tool for market design, particularly for the novel challenges presented by the digital and green economies. By modeling the strategic behavior of rational agents, we can develop frameworks that lead to efficient and stable markets with endogenously determined equilibrium prices. We first apply a three-stage Stackelberg game to the data factor market, demonstrating that a Perfectly Competitive Pricing Approach (PCPA) yields lower prices and greater social welfare. We then employ a Mean-Field Game (MFG) to analyze the carbon emission allowance (CEA) spot market, a system with a large number of interacting firms. This model characterizes optimal firm strategies and proves the solution is an ϵ-Nash equilibrium for the finite-player game.