

**Speaker: Chen Chen (IEOR)**

**Title: An Axiomatic Approach to Systemic Risk**  
(joint with Garud Iyengar and Ciamac C. Moallemi)

**Abstract:**

Systemic risk is an issue of great concern in modern financial markets as well as, more broadly, in the management of complex systems. We propose an axiomatic framework for systemic risk. Our framework allows for an independent specification of (1) a functional of the cross-sectional profile of outcomes across agents in the system in a single scenario of nature, and (2) a functional of the profile of aggregated outcomes across scenarios of nature. This general class of systemic risk measures captures many specific measures of systemic risk that have recently been proposed as special cases, and highlights their implicit assumptions. Moreover, the systemic risk measures that satisfy our conditions yield decentralized decompositions, i.e., the systemic risk can be decomposed into risk due to individual agents. Furthermore, one can associate a shadow price for risk to each agent that correctly accounts for the externalities of the agent's individual decision-making on the entire economy.