Abstract:
During the past decade, dynamic random networks have become increasingly important in communication and information technology. Vast, self-engineered networks, like the Internet, the World Wide Web, and online social networks, have facilitated the flow of information, and served as media for social and economic interaction. I will discuss both the mathematical challenges and opportunities that exist in describing these networks: How do we model these networks – taking into account both observed features and incentives? What processes occur on these networks, again motivated by strategic interactions and incentives, and how can we influence or control these processes? What algorithms can we construct on these networks to make them more valuable to the participants? In this talk, I will review the general classes of mathematical problems which arise on these networks, and present a few results which take into account mathematical, computer science and economic considerations. I will also present a general theory of limits of sequences of networks, and discuss what this theory may tell us about dynamically growing networks.