

Speaker: Evangelos “Vaki” Nikitopoulos (University of Michigan)

Title: Noncommutative stochastic calculus

Abstract: Free stochastic calculus, developed by Biane and Speicher in 1998, is often useful for describing the large- N limits of ensembles of $N \times N$ matrix stochastic processes. I shall describe a new approach, developed by David Jekel, Todd Kemp, and me, to (free or more generally) noncommutative stochastic calculus that is, like the classical theory, based primarily on the martingale property. Using this approach, we introduced a general theory of stochastic integration and quadratic (co)variation for a certain class of noncommutative processes—analogous to continuous semimartingales—that includes both the classical $N \times N$ matrix-valued Brownian motions and the q -Brownian motions. (The $q = 0$ case of the latter is the free Brownian motion.)