

Mahidol University International College

MUIC MATHEMATICS SEMINAR

Speaker: Watthanan Jatuviriyapornchai (Mahidol University)

Title: *Derivation of mean-field equations for stochastic particle systems*

Abstract

We study the single site dynamics in stochastic particle systems of misanthrope type with bounded rates on a complete graph. In the limit of diverging system size we establish convergence to a Markovian non-linear birth death chain, described by a mean-field equation known also from exchange-driven growth processes. Conservation of mass in the particle system leads to conservation of the first moment for the limit dynamics, and to non-uniqueness of stationary measures. The proof is based on a coupling to branching processes via the graphical construction, and establishing uniqueness of the solution for the limit dynamics. As particularly interesting examples we discuss the dynamics of two models that exhibit a condensation transition and their connection to exchange-driven growth processes.