MATH-IMS Joint Applied Mathematics Colloquium Series
The Chinese University of Hong Kong

This MATH-IMS Joint Colloquium Series is organized by Center for Mathematical Artificial Intelligence (CMAI), under Department of Mathematics and Institute of Mathematical Sciences (IMS) at The Chinese University of Hong Kong. The colloquium series focuses on mathematics and applications of artificial intelligence, big data and related topics.

Date: September 11, 2020 (Friday)
Time: 9am – 10am (Hong Kong Time)
Zoom Link: https://cuhk.zoom.us/j/92775210812

Quantitative convergence analysis of hypocoercive sampling dynamics
Speaker: Professor Jianfeng Lu, Duke University

Abstract: Markov chain Monte Carlo methods based on hypocoercive sampling dynamics provides promising sampling tools for high dimensional probability distributions. In this talk, we will discuss some recent advances on quantitative analysis of convergence of hypocoercive sampling dynamics, including underdamped Langevin dynamics, randomized Hamiltonian Monte Carlo, zigzag process and bouncy particle sampler. The analysis is based on a variational framework for hypocoercivity which combines a Poincare-type inequality in time-augmented state space and an energy estimate. Based on joint works with Yu Cao (NYU) and Lihan Wang (Duke).

Bio: Jianfeng Lu is a Professor of Mathematics, Physics, and Chemistry at Duke University. Before joining Duke University, he obtained his PhD in Applied Mathematics from Princeton University in 2009 and was a Courant Instructor at New York University from 2009 to 2012. He works on mathematical analysis and algorithm development for problems and challenges arising from computational physics, theoretical chemistry, materials science, high-dimensional PDEs, and machine learning. His work has been recognized by a Sloan Fellowship, a NSF Career Award, and the 2017 IMA Prize in Mathematics and its Applications.