REVISED

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: Sep 17, 2021 (Friday)
Time: ~~16:00-17:00~~ (Hong Kong Time) **3:00pm - 4:00pm**
Zoom Link: https://cuhk.zoom.us/j/92775210812

Stochastic analysis of non-linear PDEs: From probability theory to numerical simulations

Speaker: Professor Denis Talay
INRIA and Ecole Polytechnique, France

Abstract: In this survey talk we will show how the stochastic analysis of non-linear partial differential equations allows one to obtain new analytical properties of the solutions and develop innovating numerical methods. In particular, we will discuss McKean-Vlasov equations and related stochastic particle systems, with an emphasis on the fascinating Keller-Segel model. We will also discuss the application of stochastic control PDEs to modeling issues. The presentation will widely be intuitive and aimed to present intriguing open problems.

Bio: Prof. Denis Talay is Directeur de Recherche at INRIA. He also has a part time position at Ecole Polytechnique, France. Up to 2004, he intensively developed a new field: the mathematical analysis of numerical simulation methods of stochastic processes. He founded new analysis methodologies and obtained optimal convergence rates estimates in various contexts by combining stochastic analysis (e.g., Malliavin calculus, nonlinear martingale problems) and PDE analysis techniques. From 2010, he has been concentrating on singular stochastic models. Prof. Talay was an invited speaker to the 2014 International Congress of Mathematicians and President of the French Applied Mathematics Society from 2006-2009. Among his editorial duties, he currently is Area Editor of Stochastic Processes and their Applications, Editor of J. European Mathematical Society, Journal of Scientific Computing. Among his commissions of trust, he is serving as Vice-President of the Natixis Foundation which promotes academic research on financial risks and a member of the scientific committee of the French Agency AMIES which promotes interactions between Mathematics and Industry.