



DEPARTMENT OF APPLIED MATHEMATICS

應 用 數 學 系

**The Hong Kong Polytechnic University
Department of Applied Mathematics**

Colloquium

Simulation of nonlinear SPDEs: Convergence Analysis and Adaptivity

by

Professor Andreas Prohl

Universität Tübingen, Germany

Abstract

The stochastic Navier-Stokes equation, or the stochastic version of the harmonic map flow to the 2D sphere are examples for nonlinear SPDEs which only possess weak martingale solutions. In the first talk of my talk, I identify requirements for a discretization of a 'quite general' nonlinear SPDE to construct a weak martingale solution for vanishing discretization parameters.

In the second part, I discuss adaptive concepts to automatically refine space-time meshes via the distance of empirical laws of related iterates: these concepts are applied to e.g. resolve steep gradients inside interfaces in convection dominated SPDEs, or to resolve blow-up dynamics in the case of the stochastic version of the harmonic map flow to the 2D sphere.

These results base upon joint works with M. Ondrejat (Prague), N. Walkington (Pittsburgh), and C. Schellnegger (Tübingen).

Date : 23 November, 2018 (Friday)

Time : 4:00p.m. – 05:00p.m.

Venue : TU801, The Hong Kong Polytechnic University

***** ALL ARE WELCOME *****