



THE HONG KONG UNIVERSITY OF SCIENCE & TECHNOLOGY

DEPARTMENT OF MATHEMATICS

***MATHEMATICS COLLOQUIUM***

# **Approximation Techniques for Uncertainty Quantification**

By

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## Abstract

Computational model representing real-world systems are always affected by uncertainties; these are related either to assumptions and simplification in the physical models or to variability in the operating scenarios. Uncertainty Quantification (UQ) is, therefore, an important element of model validation, providing formal assessment of the sensitivity of the predictions. In this talk I will discuss two different UQ methodologies. The first approach is based on the interpolative decomposition technique which relies on matrix compression to construct a bi-fidelity sampling strategy. In spite of the promising results of this technique, difficulties are observed in the presence of strongly non-linear or discontinuous system responses. A second approach is devised using a Pade-Legendre functional expansion. The challenges of combining the two approaches in the presence of a large number of parameters are discussed as ongoing work.

**Date : 3 February 2023 (Fri)**

**Time : 3:00pm**

**Venue : Lecture Theater F (Lifts 25/26)**

*All Are Welcome!*