The Hong Kong Polytechnic University
Department of Applied Mathematics

Colloquium

Computational Multiscale Methods and Applications

By

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Abstract

Many practical problems, especially those arising from geosciences, have multiscale features due to medium heterogeneities, nonlinearity and coupling of multiple models. The goal of multiscale methods or numerical upscaling techniques is to compute the solutions of these complicated problems efficiently by constructing coarse scale equations for some dominant components of the solutions. In this talk, we will present the latest development of a class of multiscale methods, which make use of solutions of local problems to obtain coarse scale equations and have rigorous convergence theories. For nonlinear problems, the macroscopic parameters in the coarse scale equations can be computed efficiently by the use of deep learning techniques. We will discuss the general concepts and present some applications.

Biography

Prof. Eric Chung is a Professor in the Department of Mathematics in the Chinese University of Hong Kong. He obtained his PhD in 2005 from UCLA, and joined CUHK in 2008. Prof. Chung's research interests are multiscale methods, numerical upscaling, discontinuous Galerkin methods, numerical analysis and scientific computing. He was invited plenary speakers of international conferences including the SIAM Geosciences Conference and the Domain Decomposition Conference. He was awarded the ICCM Silver Medal and the HKMS Young Scholar Award.

Date: 5 October 2023 (Thursday)
Time: 16:00-17:00 (Hong Kong Standard Time GMT +8)
Venue: N002
Speaker: Prof. Tsz Shun Eric Chung, The Chinese University of Hong Kong
Host: Prof. Zhonghua Qiao, The Hong Kong Polytechnic University

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