THE UNIVERSITY   **OF HONG KONG**

Institute of Mathematical Research
Department of Mathematics

Numerical Analysis Seminar

Super-localized numerical homogenization

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Abstract

Numerical homogenization aims to effectively approximate solution operators of partial differential equations (PDEs) with heterogeneous coefficients by the choice of problem-adapted approximation spaces. Uniform convergence rates are theoretically achieved for arbitrarily rough PDE coefficients by applying the solution operator to some standard finite element space. However, the canonical basis associated with this construction is non-local and, therefore, numerically intractable. This is why the true challenge of numerical homogenization is the identification of a computable local basis for such an operator-dependent approximation space. This talk presents a near-optimal constructive solution to this so-called localization problem for prototypical linear deterministic and random elliptic operators. A sequence of numerical experiments illustrates the significance of the method for the simulation of physical processes beyond classical homogenization problems.

Date:	February 8, 2023 (Wednesday)
Time:	5:00 – 6:00pm
Venue:	ZOOM: https://hku.zoom.us/j/
	Meeting ID: 913 6532 3891
	Password: 310656

All are welcome