



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

**Colloquium**

**Reproducing kernel collocation methods for nonlocal models:  
asymptotic compatibility and numerical stability**

**By**

**Prof. Xiaochuan Tian  
University of California, San Diego**

**Abstract**

Nonlocal continuum models are in general integro-differential equations in place of the conventional partial differential equations. While nonlocal models show their effectiveness in modeling a number of anomalous and singular processes in physics and material sciences, for example, the peridynamics model of fracture mechanics, they also come with increased difficulty in computation with nonlocality involved. Aiming at both rigorous numerical analysis and computational efficiency, we present the reproducing kernel collocation methods, a class of meshfree methods, for approximating nonlocal models characterized by a length parameter that may change with the models. A central idea is to design asymptotic compatible schemes that are robust under the change of the nonlocal length parameter.

**Date : 4 November, 2020 (Wednesday)**

**Time : 9:30-10:30 (Hong Kong Standard Time GMT +8)**

**Venue : Online Talk via Zoom(Meeting ID: 92817122938)**

**Speaker: Prof. Xiaochuan Tian, University of California, San Diego**

**Host: Dr. Zhou Zhi, The Hong Kong Polytechnic University**

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

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