



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

# Colloquium

# The weak Galerkin finite element method for elliptic eigenvalue problems

## By

## **Prof. Ran ZHANG Jilin Universitv**

### Abstract

This talk is devoted to studying eigenvalue problem by the weak Galerkin (WG) finite element method with an emphasis on obtaining lower bounds. The WG method uses discontinuous polynomials on polygonal or polyhedral finite element partitions. As such it is more robust and flexible in solving eigenvalue problems since it finds eigenvalue as a min-max of Rayleigh quotient in a larger finite element space. We demonstrate that the WG methods can achieve arbitrary high order convergence. This is in contrast with classical nonconforming finite element methods which can only provide the lower bound approximation by linear elements with only the second order convergence. We also presented the guaranteed lower bound for k=1 order polynomials and some acceleration techniques are applied to WG method.

Date: 4 May 2022 (Wednesday) Time: 10:00-11:00 (Hong Kong Standard Time GMT +8) Venue: Online Talk via Zoom (Meeting ID: 915 5043 1868) Speaker: Prof. Ran Zhang, Jilin University Host: Prof. Zhonghua Qiao, The Hong Kong Polytechnic University Click to join: https://polyu.zoom.us/j/91550431868?pwd=bXBxUWRybG5XOEE3dnJNWEVrcDk5Zz09



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