



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

# Colloquium

## Divergence-free (hybrid) discontinuous Galerkin methods for incompressible flow problems

By

### Prof. Guosheng FU University of Notre Dame

#### Abstract

We present a divergence-free (hybrid) discontinuous Galerkin scheme for incompressible flow problems, including incompressible Euler and Naver-Stokes equations, incompressible MHD, and the phase-field model of incompressible two phase flow. Main features of the scheme includes globally divergence-free velocity approximation/exact mass conservation, inherent (minimal amount) numerical dissipation (via DG upwinding) for convection terms which makes the scheme stable in the convection-dominated regime without using extra residual-based stabilizations, efficient linear system solvers via hybridization.

### Bibliography

Prof. Guosheng Fu obtained his Bachelor degree from Nankai University, and obtained his Master and PhD degrees from University of Minnesota in 2016. He was a Prager Assistant Professor at Brown University, and then came to University of Notre Dame as the Tenure Track Robert and Sara Lumpkins Assistant Professor in 2019. Prof. Fu has worked on DG and HDG methods for convection dominated diffusion problems, linear elasticity problems, hyperbolic conservation laws, incompressible flows, and so on. He is also an expert in the arbitrary Lagrangian-Eulerian methods for fluid-structure interaction and moving interface problems.

Date: 25 February 2022 (Friday) Time: 10:00-11:00 (Hong Kong Standard Time GMT +8) Venue: Online Talk via Zoom (Meeting ID: 929 3651 9522) Speaker: Prof. Guosheng Fu, University of Notre Dame Host: Dr. Buyang Li, The Hong Kong Polytechnic University Click to join:



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