Computational Mathematics Seminar Series

Recent Progress in Hybrid Discontinuous Galerkin Methods

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Abstract:
A new family of hybrid discontinuous Galerkin methods is studied for second-order elliptic equations. Our approach is composed of generating PDE-adapted local basis and solving a global matrix system arising from a flux continuity equation. Our method can be viewed as a hybridizable discontinuous Galerkin method using a Bauman-Oden type local solver. A priori and a posteriori error estimates are derived and applications to the Stokes equations and Convection-Diffusion equations are discussed. Numerical results are presented for various examples.

Speaker's Bio:
Eun-Jae Park is a Professor in the Department of Mathematics and Department of Computational Science & Engineering at Yonsei University in Seoul, Korea. He earned his Ph.D. in Mathematics from Purdue University in 1993 and has held visiting positions at the University of Trento, Italy (1994-1996), University of Wyoming (1996-1997), and University of Texas-Austin (2006-2007). He is currently spending his sabbatical year at Naval Postgraduate School, Monterey.

His research interests include computational methods for partial differential equations such as locally conservative methods, adaptive finite elements, domain decomposition, multiscale computation, and uncertainty quantification.

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