

# WICHITA STATE UNIVERSITY

Department of Mathematics, Statistics & Physics

*The Lecture Series in the  
Mathematical Sciences Presents Our Guest:*

**Dr. Zhiliang Xu**

University of Notre Dame

**“Central and Central Discontinuous Galerkin (DG)  
Schemes on Overlapping Cells of Unstructured Grids  
for Solving Ideal MHD Equations with Globally  
Divergence-Free Magnetic Field”**

Abstract:

In this talk, I will present new central and central DG schemes for solving ideal magnetohydrodynamic (MHD) equations while preserving globally divergence-free magnetic field on triangular grids. These schemes incorporate the constrained transport (CT) scheme of Evans and Hawley with central schemes and central DG methods on overlapping cells which have no need for solving Riemann problems across cell edges where there are discontinuities of the numerical solution. The schemes are formally second-order accurate with major development on the reconstruction of globally divergence-free magnetic field on polygonal dual mesh. Moreover, the computational cost is reduced by solving the complete set of governing equations on the primal grid while only solving the magnetic induction equation on the polygonal dual mesh.

**Friday, April 5, 2019**

**3:00 PM in 372 Jabara Hall**

*Please come join us for refreshments before the lecture at 2:30 p.m. in room 353 Jabara Hall.*