



# Announcing

**A Mathematics Seminar  
March 27, 2009 at 2:00 pm  
Southern Hall 303**

**at The University of Southern Mississippi**

**Speaker: Huiqing Zhu**

Department of Mathematics  
Wayne State University

**Title: Local Discontinuous Galerkin Methods for Singularly Perturbed Problems**

**Abstract:**

Many interesting phenomena in many fields, such as fluid dynamics, physics, chemical kinetics and combustion, biology, etc., can be described by a singular perturbed PDE. The solution to this problem may develop layers where the solution has sharp derivatives so that its approximation at the layer will typically perform poorly.

In this presentation we consider local discontinuous Galerkin methods (LDG) for singularly perturbed convection-diffusion problems on a two-dimensional domain. Both mixed form and non-mixed form of LDG discretization on a structured adaptive mesh are introduced.

We will show that two approximations of the gradient converge at different rates. Moreover, the convergence rate of the error in non-mixed method is optimal and independent of  $\varepsilon$ . Numerical experiments are also considered to verify the theoretical results.

**Further Information**

Further details and information about this and other departmental activities is available online at [http://www.math.usm.edu/bulletin\\_board/](http://www.math.usm.edu/bulletin_board/).