

数学与系统科学研究院

计算数学所学术报告

报告人: **Prof. Chi-Wang Shu**

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报告题目:

**Optimal energy-conserving  
discontinuous Galerkin methods for  
wave equations**

邀请人: 周爱辉 研究员

报告时间: **2019 年 3 月 27 日 (周三)**

**下午 14:00-15:00**

报告地点: **数学院南楼七层**

**702 教室**

## **Abstract:**

Energy conservation is an important property for many time dependent PDEs, such as linear hyperbolic systems, linear and nonlinear dispersive wave equations including KdV equations, etc. Discontinuous Galerkin (DG) methods are often used to solve such problems, especially when adaptivity is desired. However, it is difficult to design energy conserving DG methods for such problems with optimal convergence in the  $L^2$ -norm. In this talk we will describe our recent work in designing such DG schemes, which involves the technique of possible doubling of unknowns. Optimal a priori error estimates of order  $k+1$  are obtained for the semi-discrete scheme in one dimension, and in multi-dimensions on Cartesian meshes when tensor-product polynomials of degree  $k$  are used, for linear hyperbolic and dispersive wave equations. Computational results for linear and nonlinear problems including those in aeroacoustics, Maxwell equations and KdV equations, on both structured and unstructured meshes, demonstrate the excellent performance of these energy conserving schemes. This is joint work with Guosheng Fu.

**欢迎大家参加！**