

# WICHITA STATE UNIVERSITY

Department of Mathematics and Statistics

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

## Prof. Chi-Wang Shu

Brown University

*"High Order Numerical Methods for  
Hyperbolic Problems"*

Abstract:

Hyperbolic problems appear very often in applications. Noticeable examples are compressible gas dynamics, useful for aircraft design, and hydrodynamic models for semiconductor physics, useful for electronic device simulations. Numerical simulations of such problems are difficult because the solution typically contains both strong discontinuities (shocks) and rich smooth structures (e.g. turbulence). High order methods are very efficient for solving such problems, however they are difficult to design because they typically generate spurious numerical oscillations near the discontinuities of the solution.

In this talk we will first describe the general properties of hyperbolic problems and basic concepts of numerical methods for such problems. We will then describe our recent work in developing high order finite difference, finite volume and finite element methods for such problems. Numerical results will be shown.

Friday, March 18, 2005  
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.*