



Differential Equations and Applied Math Seminar

Dr. Ray Treinen, Texas State University

11am-12pm October 25th, 2019

336 Derrick Hall

Title: Spectral Methods VI

Abstract: We will look at Spectral and Pseudospectral Methods for numerically computing solutions of certain problems.

We continue this series of lectures with stability considerations for approximating solutions of partial differential equations. We will discuss the concept of the pseudospectra of an operator as an improved measure for creating stable numerical methods using the method of lines. The operators that necessitate this consideration beyond the more traditional spectra are nonnormal operators. The particular nonnormal operators we will discuss are based on the Chebyshev differentiation matrices, though we will present the general theory.

Our primary source material is Trefethen's *Spectral Methods in Matlab*, supplemented by Trefethen & Embree *Spectra and Pseudospectra* and Lambert's *Numerical Methods for Ordinary Differential Systems*.

Interested faculty and graduate students are encouraged to attend.