



*The rising STAR of Texas*

## Differential Equations and Applied Math Seminar

Dr. Ray Treinen, Texas State University

11am-12pm April 6th, 2018

326 Derrick Hall

**Title:** Free discontinuity problems with applications to fracture mechanics, part 1

**Abstract:** We continue with the mathematical background needed to treat fracture models and image reconstruction models in the framework of minimizing an energy functional. We will begin with a discussion of the complexities of adding boundary data into the minimization process directly. Then we will continue by discussing the space of piecewise-Sobolev functions, and their applications. Then we will present a theorem on the coerciveness and lower semicontinuity of energies on  $P-W^{1,p}(a, b)$  of the form

$$F(u) = \int_{(a,b)} f(u')dt + \sum_{S(u)} \vartheta(u^+ - u^-),$$

where  $S(u)$  is the set of discontinuities, or fractures, of  $u$ . We are mostly following the book by Andrea Braides.

Interested faculty and graduate students are encouraged to attend.