



University of
Central Arkansas™

DEPARTMENT OF MATHEMATICS MASTER THESIS DEFENSE

- Speaker:** Eric Jones, Graduate Student
Department of Mathematics
- Title:** Symmetry and Compatibility of a Reaction-Diffusion Equation
- Date:** Friday, April 17, 2015
- Time:** 2:00—3:00 p.m.
- Place:** MCS 212

Abstract: Symmetry and Compatibility of a Reaction-Diffusion Equation

Lie's classical method, established in the late nineteenth century to solve partial differential equations (PDEs), was used to study the one-dimensional reaction-diffusion equation, $u_t = (D(u)u_x)_x + Q(u)$, in the 1980s by Dorodnitsyn and again in the 1990s by Arrigo *et al.* using an extension of the classical method known as the nonclassical method established by Bluman. Arrigo further streamlined the nonclassical method in 2003 by finding compatibility between a PDE and its invariant surface condition. The scope of this thesis is to take the compatibility method established by Arrigo and generalize the invariant surface condition in order to find more solutions to the reaction-diffusion equation.