

**Title: Numerical Computations of Generalized Korteweg-de Vries (KdV) equations**

**Presenters: Andrew Madsen and Scott Sims**

**Faculty Advisor: Dr. Ramjee Sharma**

**Abstract:**

We consider the following generalized Korteweg-deVries (KdV) equation

$$u_t + au_x + 2buu_x + cu_{xxx} - du_{xx} = 0.$$

The above equation is the generalized version of the KDV equation

$$u_t + u_x + 2uu_x + \delta u_{xxx} = 0.$$

Here  $u = u(x, t)$  is a scalar function of  $x \in R$  and  $t \geq 0$ , while  $\delta > 0$  is a parameter. This equation is used to model the unidirectional propagation of water waves. The scalar  $u$  represents the amplitude of the wave.

In this presentation we investigate the various limits of the solutions of the generalized equation as one or more of the parameters as  $a, b, c$  and  $d$  tend to zero. This is carried out through numerical computations using the pseudo-spectral method.