1145-35-453   **John David Cobb*** (`jdcobb3@gmail.com`), **Alex Kasman**, **Albert Serna** and **Monique Sparkman**. *Breather Soliton Interactions for the Quaternionic KdV Equation.*

The KdV equation is fundamental in the description of a wide array of physical phenomena. It remains the prototypical example of a completely integrable nonlinear partial differential equation because of its *n-soliton* solutions, which appear to be composed of n traveling waves that collide in particle-like fashions. Despite this fame, little has been said about KdV solitons in a noncommutative setting. In this project, Darboux transformations were used to produce quaternion-valued solutions to the non-commutative KdV equation. I will describe the nonlinear superposition principle governing the interactions of the breather soliton solutions with other solutions including rational and periodic solutions. Finally, I will examine the kinetics of the general 2-soliton interaction, including a formula for the phase shift which, unlike the commutative case, is not determined by the wave numbers of the constituent 1-solitons. (Received September 06, 2018)