1145-35-61   **John Cobb** and **Alex Kasman*** (`kasmana@cofc.edu`), Department of Mathematics, 66 George Street, Charleston, SC 29424, and **Albert Serna** and **Monique Sparkman**. *Quaternion-valued Solutions to the Korteweg-deVries Equation.* Preliminary report.

Soliton equations are nonlinear PDEs whose solutions have surprising particle-like behavior and which can be solved exactly using algebro-geometric methods. Because there has been recent interest in *non-commutative* generalizations, we have undertaken a study of quaternion-valued solutions to the KdV equation as a student research project. The solutions produced by our methods include rational solutions, periodic solutions and breather soliton solutions. Among the theorems we prove about them is one in which the surprising effect of non-commutativity on the phase shift (essentially, the "bounce" when two solitons collide) is made apparent. The talk will end with a list of open questions that we hope the experts at this session will be able to help us to answer. (Received July 15, 2018)