

# **Undergraduate Mathematics Colloquium**

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**“Hamilton's quaternions and how to  
algebraically roll a ball”**

**Friday September 30**

Talk at 4:00 in Herman Brown 227

Tea at 3:30 in Herman Brown 438

**ABSTRACT:** For fifteen years, William Rowan Hamilton attempted to devise a way to multiply points in three-dimensional space, much like one multiplies points in two-dimensional space by viewing them as complex numbers. His eureka moment occurred when he realized that his difficulties would vanish if he instead multiplied points in four-dimensional space. We will introduce the resulting abstract algebraic structure called the quaternions and see how they have a surprising connection to the geometry of rotations.

No background beyond 200 level classes should be necessary. In particular, no knowledge of abstract algebra will be assumed.

**Rice University Department of Mathematics**