**Title:** S3 and Quaternions – Group Theory and Efficiently Encoding 3-D Rotations

**Abstract:** My talk will briefly cover S3 and go into detail about the group theory and an application of quaternions. The 3-dimensional sphere, S3, is the set of points one unit away from the origin in R4. Quaternions, an extension of complex numbers into 4 dimensions, have interesting applications in the encoding of rotations in 3-D space.