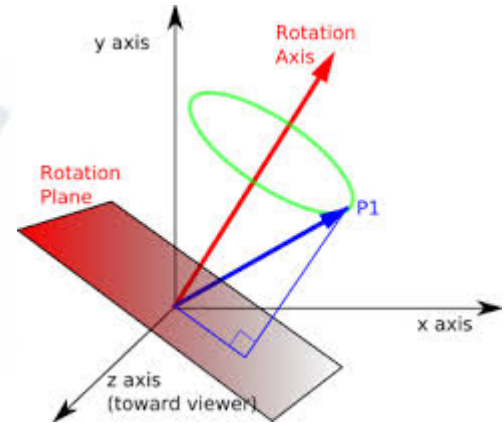
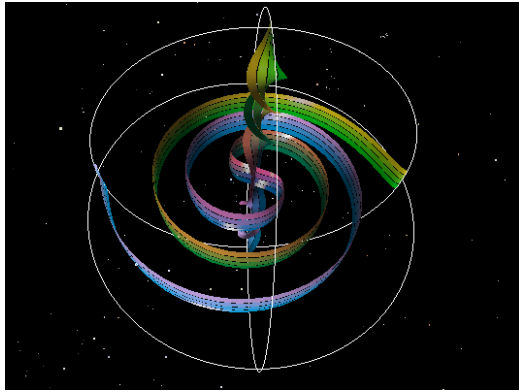


# Department of Mathematics

## Spring 2015 Colloquium Series



## “Dirac’s Belt Trick, the iPad® and the Quaternions

Richard Koch, Professor of Mathematics  
University of Oregon

Thursday, February 19, 2015

Behavioral and Social Sciences Building Room 166, 4 p.m.

*In 2010, Apple announced the addition of a gyroscope to the components in the iPad. The key step was to ask the operating system for the orientation of the iPad. The software responded with three descriptions of this orientation: 1) roll, pitch, and yaw; 2) a rotation matrix; 3) a quaternion I'll explain the disadvantages of 1) and 2), and then develop the quaternions from scratch and explain how they can be used to describe rotations in 3-space and 4-space.*

*For a complete abstract, go to <http://www.humboldt.edu/math/news-and-events/math-colloquium>*

*We invite you to the Pre-colloquium Tea on the third floor of the BSS  
building at 3:30 on Thursday.*