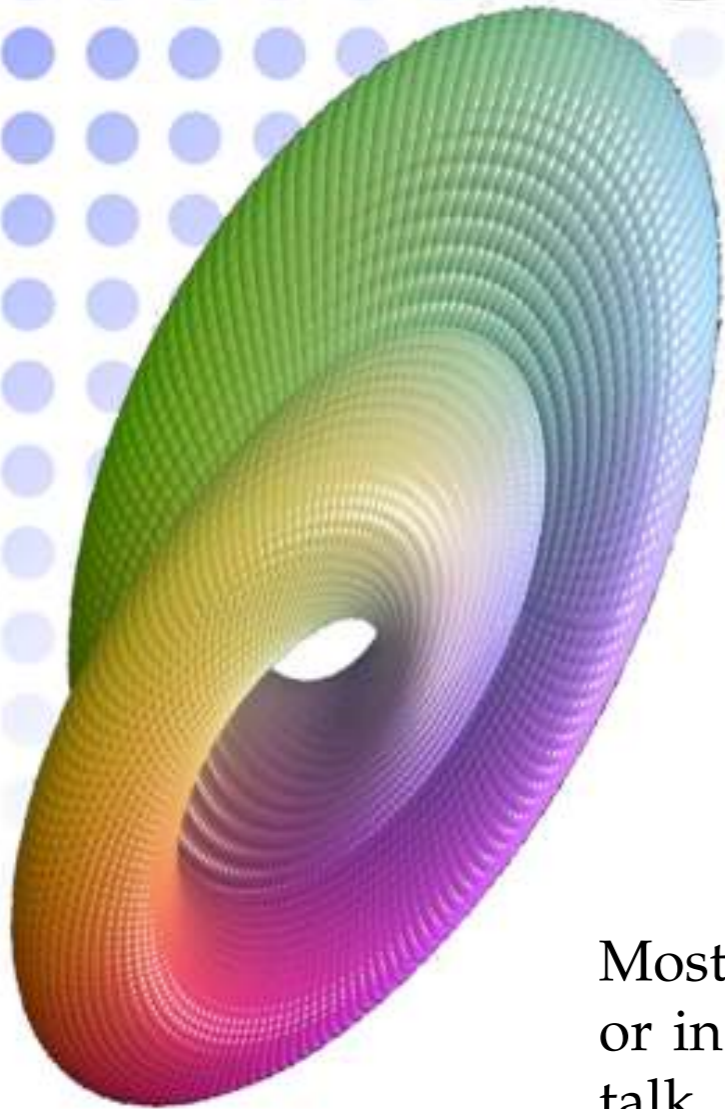
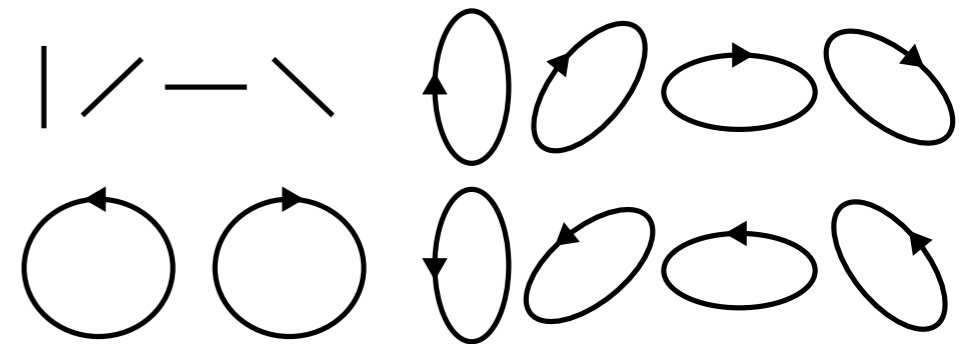


# Michigan Math Club

Thursday at 4pm in the Nesbitt Room  
Free Pizza and Pop



## Polarized light and the Hopf fibration



Igor Kriz • 26 September 2019

Most people know that light can be polarized in a plane, horizontal, vertical, or in between. But there are also left and right circular polarizations. In this talk, we will discuss the basic concept of quantum mechanics, where a state of a particle is represented by an element of a complex vector space. On the example of a single photon, we will explore how linear combinations of two basic polarization states with complex coefficients account for all the observed polarization states of light. We will also discuss how this physical observation is related to a basic but surprising fact of algebraic topology, namely the existence of homotopically non-trivial maps from the 3-sphere to the 2-sphere.

