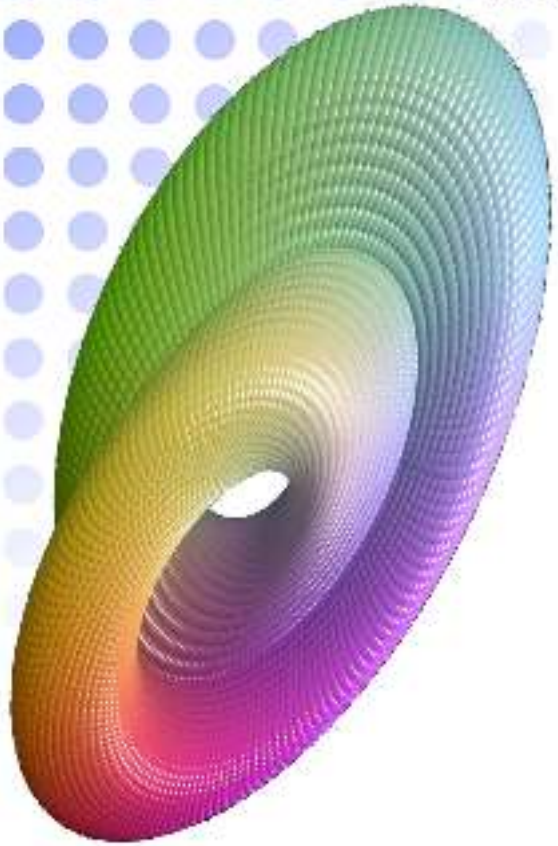
Michigan Math Club

Thursday at 4pm in the Nesbitt Room

Free Pizza and Pop



The BKK Root Count on $\mathbb{C}^N$

Robert Walker

26 January 2017

The simplest objects of study in algebraic geometry – algebraic loci – generalize the notion of kernel for linear transformations between vector spaces; the usual $Ax=b$ matrix expression from linear algebra can be rewritten as a system of linear polynomials set equal to zero. The main problem of this talk will be: given a system of N nonconstant polynomials in N complex variables, whose algebraic locus V in $\mathbb{C}^N$ is a finite set of size D, how often can we compute D? Very often, actually, per a theorem from the 1970's – along with a slight tweak from 1996. The backdrop is a confluence of algebraic- and convex geometry, where in low dimensions, one can draw pictures, compute areas and volumes of convex polytopes, and substitute these values into an alternating sum to compute D by hand. This talk will feature several pictures, a few example computations using a tweaked version of the BKK Theorem, and possibly a cameo of Stirling partition numbers.