
MATT HEDDEN, Michigan State University

Obstructing the existence of algebraic curves in $\mathbb{C}P^2$ with prescribed singularities

A non-singular algebraic curve in the complex projective plane of degree d has topological genus $(d-1)(d-2)/2$. If the curve has singularities, yet topologically is still an embedded surface, then the genus will be lower. Heuristically, some of the topology gets pushed into the singularities. This talk will examine the question of which configurations of singularities can arise in algebraic curves of degree d that have some fixed topological genus. I will discuss new obstructions, which come from Floer homology, that imply the non-existence of algebraic curves with certain configurations of singularities. Refining our obstructions with algebro-geometric techniques leads to a classification of genus one curves with a single simple singularity. Perhaps surprisingly, the degrees and singularity types which arise are given by even terms in the Fibonacci sequence. This is joint work with Maciej Borodzik and Charles Livingston