# OSU/UIC/UM Algebraic Geometry Workshop Abstracts

## Sabin Cautis

Title: Equivalences via geometric sl(2) actions

Abstract: I will explain how sl(2) actions can be used to construct equivalences between derived categories of coherent sheaves. The example we consider are the derived categogries of coherent sheaves on cotangent bundles to Grassmannians. Our construction generalizes Seidel-Thomas twists.

In the pre-talk we will review the basic representation theory of sl(2). Then we will review the derived category of coherent sheaves on a variety and motivate its study.

## David Smyth

Title: Modular compactifications of  $M_{q,n}$ 

Abstract: A modular compactification of  $M_{g,n}$  is (roughly) a deformation-open class of singular curves with the property that every one-parameter family of smooth curves has a unique limit contained in that class. A modular compactification is stable if all the curves parametrized have the property that every rational component has three distinguished points. We will present a general classification of modular compactifications of  $M_{g,n}$  in terms of simple combinatorial data, which will include Schubert's moduli space of pseudostable curves and Hassett's spaces of weighted pointed stable curves as special cases.

# Hsian-Hua Tseng

### Title: Gromov-Witten theory for root stacks

Abstract: Let r be a positive integer. Given a line bundle L over a space X there is a stack  $\sqrt[r]{L/X}$  over X which classifies r-th roots of L. This stack of r-th roots of L, which is a gerbe over X banded by the cyclic group of order r, appears naturally in various places such as the structure result of toric Deligne-Mumford stacks. The goal of this talk is to discuss recent progresses towards understanding Gromov-Witten theory of such stacks of roots (joint work with E. Andreini and Y. Jiang).

#### Michael Zieve

#### Title: Automorphism groups of curves

Abstract: Hurwitz proved that a complex algebraic curve of genus g > 1 has at most 84(g-1) automorphisms. In case equality holds, the automorphism group has a quite special structure. However, in a qualitative sense, all finite groups G behave the same way: the least g > 1 for which G acts on a genus-g curve is on the order of  $(\#G) \cdot d(G)$ , where d(G) is the minimal number of generators of G. I will present joint work with Bob Guralnick on the analogous question in positive characteristic. In this situation, certain special families of groups behave fundamentally differently from others. If we restrict to G-actions on curves with ordinary Jacobians, we obtain a precise description of the exceptional groups and curves.