Berkeley-Stanford
Algebraic Geometry Seminar

Tuesday, October 21, at Stanford (Rm. 200–107, 3:15–4:15 and 4:45–5:45)

ALLEN KNUTSON (Berkeley): Simplicial complexes and B-B decompositions

Abstract: For M a compact manifold with a Morse function (or better, M a projective variety with an algebraic circle action with isolated fixed points), we get a decomposition of M into Morse strata. When we're lucky, this is a stratification, partially ordering the strata; a famous example is M a flag manifold with the Bruhat stratification, and the order complex of this partial order turns out to be homeomorphic to a ball.

I'll explain the right definition to replace the order complex when (as is more usual) this decomposition is not a stratification, and how it's motivated by "Samuel-Rees filtrations" and their associated degenerations. The end result is a "path model" for the coordinate ring of M, specializing to the celebrated Littelmann path model in the flag manifold case, but independent of any representation theory.

SÁNDOR KOVÁCS (Washington): Recent advances in the Minimal Model Program, after Shokurov

Abstract: One of the major discoveries of the last two decades in algebraic geometry is the realization that the theory of minimal models of surfaces can be generalized to higher dimensional varieties. The major initial architects of the resulting theory in the 1980s were Y. Kawamata, J. Kollár, S. Mori, M. Reid, and V. V. Shokurov. They have built a theory of minimal models that works in all dimensions except for one crucial step: the existence and termination of flips.

Flips are birational operations that only appear in higher dimensions and their definition does not assure their existence. Nevertheless they are essential to obtaining mimimal models. It has proved extremely difficult to show the existence of flips. Mori proved their existence in dimension three, which earned him the Fields Medal in 1990, but there has been very little advance in dimensions four and higher for a long time.

Recently Shokurov introduced revolutionary new ideas that immediately gave a more theoretical proof of the three-dimensional case and may lead to a complete solution to the problem.

In this talk, the Minimal Model Program will be introduced, including key definitions, theorems, and procedures. Flips will be defined and their importance discussed.

Time permitting, Shokurov's new ideas will be discussed and put into perspective with regard to the previous ideas of the theory.

There will be a dinner afterward.

This seminar alternates between Stanford and Berkeley. To organize transportation from Berkeley to Stanford, please contact Tom Graber

`http://math.stanford.edu/~vakil/seminar0304/`