Department of Mathematics
University of Notre Dame

ALGEBRAIC GEOMETRY AND COMMUTATIVE ALGEBRA SEMINAR

Speaker: Juan Migliore
University of Notre Dame

Date: Wednesday, January 29, 2020
Time: 3:00 PM
Location: 258 Hurley Hall

Lecture Title:
The singular locus of a hyperplane arrangement in P^3, and liaison

Abstract
This talk will describe joint with with Uwe Nagel and Hal Schenck. Let A be a hyperplane arrangement in P^3. (Much of the work actually holds in P^n.) Let J be the Jacobian ideal of A. This ideal is usually not unmixed, or even saturated. We consider two associated ideals, J^{top} and \sqrt{J}, both of which ARE unmixed and define equidimensional curves X^{top} and X^{red} in P^3. These curves both have a claim to being called the (unmixed) singular locus of A. If a certain fairly mild combinatorial property (*) of the incidence lattice of A is satisfied, both X^{top} and X^{red} are arithmetically Cohen-Macaulay (ACM). If (*) does not hold, either or both of these curves may fail to be ACM. In fact, they can be made to fail to be ACM by as much as you like (as measured by the dimension of the Hartshorne-Rao module). The proofs use tricks from liaison, which in turn prompt liaison-related questions. We will briefly review facts from liaison along the way.

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