Mathematics, Statistics, and Computer Science **@ UIC**

Algebraic Geometry Seminar

The Geometry of Hilbert's 13th problem

Jesse Wolfson (University of California Irvine)

Abstract: Given a polynomial x^n+a_1x^{n-1}+ . . . + a_n, what is the simplest formula for the roots in terms of the coefficients a_1, . . . a_n? Following Abel, we can no longer take "simplest" to mean in radicals, but we could ask for a solution using only 1 or 2 or d-variable functions. Hilbert conjectured that for degrees 6,7 and 8, we need 2,3 and 4 variable functions respectively. In a too little known paper, he then sketched how the 27 lines on a cubic surface should give a 4-variable solution of the general degree 9. In this talk, I'll review the geometry of solving polynomials, explain Hilbert's idea, and then extend his geometric methods to get best-to-date upper bounds on the number of variables needed to solve a general degree n polynomial.

Wednesday, August 28 at 4:00 PM in 427 SEO