1116-VE-468 **Elena Alicia Gonzalez Malloy*** (elena.malloy@yale.edu), 13 Yearling Chase, Mount Laurel, NJ 08054. *The Geometry of the Discriminant over Finite Fields.* Preliminary report.

In his paper, *A Remarkable Geometry of Discriminant Varieties*, Katz concludes the problem of finding the solutions to a polynomial is equivalent to the problem of finding tangent hyperplanes to the discriminant. Although tangency is difficult to visualize in the same manner over a finite field, the formal derivative allows us to preserve the behavior of a derivative without limits, thus also preserving the tangent. Because of this, the relationship that Katz concluded translates to any field—in particular the finite field F_q, where $q = p^k$, for some prime p and integer k. To depict this relationship we have experimented with ways of visualizing the natural structure of F_q. These visualizations each consider all the monic quadratics in the field to answer the question: Is it on the discriminant, does it have two unique solutions or does it have no solution? To interpret these results, we used Katz' conclusions to bridge the gap between number theory and geometry. In further studies, we analyzed the distribution of the discriminant for polynomials of degree $n = 2, 3, 4$ over finite fields. Combined, these results help us better understand the pattern of the discriminant over finite fields and its connection to the geometry of solutions. (Received September 03, 2015)