Alternate Mirror Families and Hypergeometric Motives

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Abstract

Mirror symmetry predicts surprising geometric correspondences between distinct families of algebraic varieties. In some cases, these correspondences have arithmetic consequences. Among the arithmetic correspondences predicted by mirror symmetry are correspondences between point counts over finite fields, and more generally between factors of their Zeta functions. In particular, we will discuss our results on a common factor for Zeta functions alternate families of invertible polynomials. We will also explore closed formulas for the point counts for our alternate mirror families of K3 surfaces and their relation to their Picard–Fuchs equations. Finally, we will discuss how all of this relates to hypergeometric motives. This is joint work with: Charles Doran (University of Alberta, Canada), Tyler Kelly (University of Cambridge, UK), Steven Sperber (University of Minnesota, USA), John Voight (Dartmouth College, USA), and Ursula Whitcher (American Mathematical Society, USA).

Date : Wednesday, June 14, 2017
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