

ALGEBRA AND NUMBER THEORY COLLOQUIUM

An introduction to counting curves arithmetically

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Abstract: A long-standing program in algebraic geometry focuses on counting the number of curves in special configuration such as the lines on a cubic surface (27) or the number of conic curves tangent to 5 given conics (3264). While many important counting results have been proven purely in the language of algebraic geometry, a major modern discovery is that curve counts can often be interpreted in terms of algebraic topology and this topological perspective reveals unexpected properties.

One problem in modern curve counting is that classical algebraic topology is only available when working over the real or complex numbers. A successful solution to this problem should produce curve counts over fields like the rational numbers in such a way as to record interesting arithmetic information. My talk will explain how to derive such counts using ideas from A1-homotopy theory. The talk will focus on joint work with Marc Levine, Jake Solomon, and Kirsten Wickelgren including a new result about lines on the cubic surface.

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