Title: Enumerative Geometry and Arithmetic

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Abstract: Traditional enumerative geometry asks certain questions to which the expected answer is a number. An early example by Euclid demonstrated that the number of lines which connect two points in the plane is 1. More recently it was computed that the number of twisted cubic curves on a quintic threefold is $317,206,375$. A deeper investigation into these numerics often reveals interesting geometric, topological, and representation-theoretic structures. This summer program will be devoted to investigating the hidden structures behind certain enumerative invariants in symplectic geometry by way of modern methods from number theory. No familiarity with symplectic geometry will be assumed, though coursework in number theory, Galois theory, topology, manifolds, and real analysis will be helpful.