Nathan Kaplan

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Mathematics Colloquium

Monday, March 23, 2020
Time: 4:00 p.m.
Location: Weber 223

Title: Codes from Families of Polynomials over Finite Fields

Abstract: What is the maximum number of points in the projective plane over a finite field of size q such that no three points lie on a line? More generally, what is the maximum number of points in the n-dimensional projective space over F_q such that no n+1 points lie in a hyperplane? How many of the q^{10} homogeneous cubics in x,y,z have exactly q+2 zeros? How many of the q^{20} pairs of these polynomials have exactly k common zeros?

We will explain how these questions, and many others, can be phrased as problems about certain error-correcting codes. We will emphasize connections between coding theory, classical algebraic geometry, combinatorics, and number theory. We will start from the basics— no previous familiarity with coding theory will be assumed.

Host: Anton Betten

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