



## Theoretical Statistics and Mathematics Unit

### Seminar

Date: January 25, 2017

Time: 04:15 PM

Venue: L-Infinity, Stat-Math Unit (5th Floor, A.N. Kolmogorov Bhavan)

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### Polynomial equations over finite fields

#### Abstract

We will consider the following question:

Given a system of a fixed number of linearly independent homogeneous polynomial equations of a fixed degree with coefficients in a finite field  $F$ , what is the maximum number of common zeros they can have in the corresponding projective space over  $F$ ?

The case of a single homogeneous polynomial (i.e., hypersurface) corresponds to a classical inequality proved by Serre in 1989. For the general case, an elaborate conjecture was made by Tsfasman and Boguslavsky, which was open for almost two decades. We will outline these developments and report on some recent progress.

An attempt will be made to keep the prerequisites at a minimum. If there is time and interest, connections to coding theory will also be outlined.

All are cordially invited

