Conferencia

On constructions of towers over finite fields

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Resumen:

The subject of this talk goes around the question: How many rational points (points with coordinates in a finite field) can a nonsingular projective curve have? The answer to this question is the famous Hasse-Weil theorem. Ihara noticed the weakness of this theorem for high genus curves.

We are going to use the language of function fields. A function field F over a finite field k is a finite and separable extension of the rational function field k(x), with k being algebraically closed in F. Let g(F) denote the genus and N(F) denote the number of places of degree one (rational places). We are interested in the behaviour of the ratios N(F)/g(F), when the genus is very large with respect to the cardinality of the finite field k. A tower over k is an infinite sequence of function field extensions F_(n+1) / F_n with g(F_n) growing to infinity with n. We are going to present some ideas on constructions of good towers; i.e., towers with large limits for the ratios of rational places by the genus. The towers will be recursive; i.e., they will be obtained from a single polynomial in two variables with coefficients in the finite field k.