Philadelphia Area Number Theory Seminar

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Locally recoverable codes with arbitrarily many recovery sets from maximal curves

Abstract: A locally recoverable code is an error correcting code in which each position (coe cient) of a given codeword can be recovered with access to only r other positions. These were developed to meet needs in distributed data storage, where information may be stored on large banks of servers. It is desirable that any given codeword be distributed over many servers so that the information can be recovered if a single server fails. However, if many servers fail, it might be necessary to have multiple recovery sets for each position in order to recover it. In this talk, I present a construction of locally recoverable codes for which each coordinate has several disjoint recovery sets. The construction is based on curves over nite elds, and is a generalization of work by Barg, Tamo, and Vladut. New examples are built on the Suzuki curves, the generalized GK family, and a family of maximal curves from Van der Geer and Van der Vlugt. The problem also raises combinatorial problems that may be accessible to undergraduate students. This is joint work with Kathryn Haymaker and Gretchen Matthews.

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