Algebra and Number Theory Seminar

Clusters and semistable models of hyperelliptic curves

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Abstract: For every hyperelliptic curve C given by an equation of the form $y^2 = f(x)$ over a discretely-valued field of mixed characteristic $(0, p)$, there exists (after possibly extending the ground field) a model of C which is *semistable* – that is, a model whose special fiber (i.e. the reduction over the residue field) consists of reduced components and has at worst very mild singularities. When p is not 2, the structure of such a special fiber is determined entirely by the distances (under the discrete valuation) between the roots of f, which we call the *cluster data* associated to f. When $p = 2$, however, the cluster data no longer tell the whole story about the components of the special fiber of a semistable model of C, and constructing a semistable model becomes much more complicated. I will give an overview of how to construct "nice" semistable models for hyperelliptic curves over residue characteristic not 2 and then describe recent results (from joint work with Leonardo Fiore) on semistable models in the residue characteristic 2 situation.

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