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Cubic Function Fields in Characteristic 3

Much of our knowledge and insight into function field (from a computational perspective) comes from extending what has been learned in the number field case to this new setting. While this can work in positive characteristic, things tend to go awry when the characteristic of the field divides the degree of the extension. The simplest example of this is elliptic and hyperelliptic function fields in characteristic two. In this situation, while many things become more complicated, they are still manageable enough because they are relatively well behaved. By doing something as innocuous as looking at cubic function fields in characteristic three, even calculating the most mundane invariant becomes problematic.

In this talk, we highlight some of the challenges in this area and some successes. We also highlight a class of curves that could be (in some sense) considered an analogue of hyperelliptic curves in characteristic two.

This is joint work with Jonathan Webster.