The 7th East Asia Number Theory Conference

New points on algebraic curves (Joint work with Dino Lorenzini)

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Let K be a field and let L/K be a finite extension. Let X be an algebraic variety over K. A point of $X(L)$ is called a *new point* if it does not belong to any of $X(F)$, when F runs over all proper subextensions of L.

Fix now a separable extension L/K of degree d. We investigate whether there exists a smooth proper geometrically connected curve of genus $g > 0$ with a new point in $X(L)$. We show that if K is infinite with char(K) different from 2 and if $g > [d/4]$, then there exist infinitely many hyperelliptic curves X of genus g, pairwise non-isomorphic, and with a new point in $X(L)$. When $1 < d < 11$, we show that there exist infinitely many elliptic curves X with pairwise distinct j-invariants and with a new point in $X(L)$.