



## Colloquium

October 23, 3:00 p.m. (8<sup>th</sup> Period)  
(in the Atrium)

**Speaker:** Darren Schmidt

**Title:** Ekedahl-Oort Types in  $\mathbb{Z}_p$  Towers of Curves

### Abstract

Let  $k$  be a finite field of characteristic  $p > 0$  and let  $K = k(x)$ , the field of rational functions in  $x$  over  $k$ . Artin-Schreier-Witt Theory gives us a way to create a sequence of Galois extensions starting at  $K$ , each of degree  $p$ . Each function field in this tower corresponds to a curve over  $k$ , and we call the collection of these curves a basic  $\mathbb{Z}_p$  tower. Associated to each curve is a geometric object called the Jacobian, which extends the idea of the class group from algebraic number theory. The Jacobian is a complicated object, so we focus on examining the Ekedahl-Oort type, a combinatorial invariant derived from the Jacobian. Previous work leads us to believe that the Ekedahl-Oort type should exhibit some form of regularity up a  $\mathbb{Z}_p$  tower of curves. In this talk, we go over the background of why we expect this regularity, and we discuss computational evidence that demonstrates regularity in the Ekedahl-Oort type, and therefore in the Jacobian, up a  $\mathbb{Z}_p$  tower of curves.