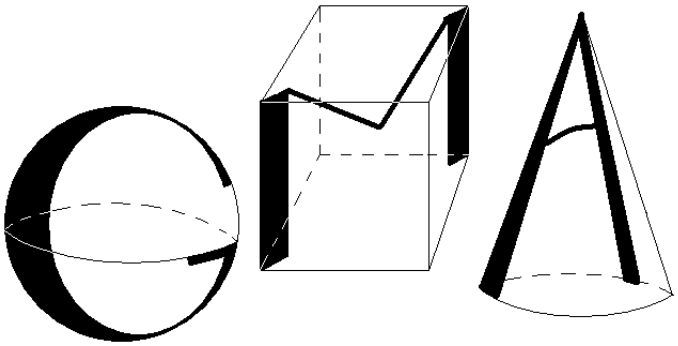

Colloquium

Wednesday March 4, 3:00 p.m. (8^{th} Period)

In the Atrium
Refreshments provided.

Speaker: Iris Shi

Title: Artin-Schreier curves and the Cartier-Manin Matrix

Abstract

An Artin-Schreier curve is a finite morphism of smooth, projective, connected curves over the projective line with Galois group $\mathbb{Z}/p\mathbb{Z}$. The Cartier operator is dual to the Frobenius on $H^1(X, O_X)$ via Serre duality, making it a key tool in the algorithmic study of curves over finite fields and has a representative matrix called the Cartier-Manin matrix. In 2018, Booher and Cais showed that the a-number of an Artin-Schreier curve must be greater than a lower bound determined by the ramification of the cover. In this talk, we provide evidence that the lower bound is optimal by finding examples of Artin-Schreier curves that have a-number equal to its lower bound by analyzing certain properties of the Cartier-Manin matrix.