

1176-11-128

Evan M. O’Dorney* (eodorney@nd.edu). *Reflection theorems for counting quadratic and cubic polynomials.*

Scholz’s celebrated 1932 reflection principle, relating the 3-torsion in the class groups of $\mathbb{Q}(\sqrt{D})$ and $\mathbb{Q}(\sqrt{-3D})$, can be viewed as an equality among the numbers of cubic fields of different discriminants. In 1997, Y. Ohno discovered (quite by accident) a beautiful reflection identity relating the number of binary cubic forms, equivalently cubic rings, of discriminants D and $-27D$, where D is not necessarily squarefree. This was proved in 1998 by Nakagawa, establishing an “extra functional equation” for the Shintani zeta functions counting binary cubic forms. In my talk, I will present a new and more illuminating method for proving identities of this type, based on Poisson summation on adelic cohomology (in the style of Tate’s thesis). Also, I will present a corresponding reflection theorem for quadratic polynomials of a quite unexpected shape. The corresponding Shintani zeta function is in two variables, counting by both discriminant and leading coefficient, and finding its analytic properties is a work in progress. (Received January 18, 2022)