

Roland Roeder

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will speak on

**Computing arithmetic invariants for hyperbolic
reflection groups**

ABSTRACT: I will demonstrate a collection of computer scripts written in PARI/GP to compute the commensurability invariants known as the invariant trace field and invariant quaternion algebra for reflection groups determined by compact polyhedra in \mathbb{H}^3 . These scripts also allow one to determine arithmeticity of such groups and the isomorphism class of the invariant quaternion algebra by analyzing its ramification.

I present many computed examples of these invariants. This is enough to show that most of the groups that we consider are pairwise incommensurable. For pairs of groups with identical invariants, not all is lost: when both groups are arithmetic, having identical invariants guarantees commensurability. We discover some “unexpected” commensurable pairs this way. We also present a non-arithmetic pair with identical invariants for which we cannot determine commensurability.

This is joint work with Omar Antolin-Camarena and Gregory Maloney.

TUESDAY, 7 APRIL 2009

LECTURE AT 2:40 PM

ROOM 617, WACHMAN BUILDING

DEPARTMENT OF MATHEMATICS