

M E M O R A N D U M

DATE: 03/03/2024

TO: Faculty and Students

FROM: Professor(s) Julien Paupert
Chair/Co-Chairs of Philip Doi
Defense for the PhD in Mathematics
Committee Members
Brett Kotschwar
Matthias Kawski
Nancy Childress
Susanna Fishel

DEFENSE ANNOUNCEMENT

Candidate: Philip Doi

Defense Date: Tuesday, April 09, 2024

Defense Time: 2:00 PM

Virtual Meeting Link:

<https://asu.zoom.us/j/6249384606?pwd=Z25VdVRiREtLNjBGQ1UvOFdrVW13UT09>

Location: Wexler Hall (Tempe) WXMLR A206

Title: Hyperbolic Coxeter groups with Multiple Infinity Edges

Please share this information with colleagues and other students, especially those studying in similar fields. Faculty and students are encouraged to attend. The defending candidate will give a 40-minute talk, after which the committee members will ask questions. There may be time for questions from those in attendance. But, guests are primarily invited to attend as observers and will be excused when the committee begins its deliberations or if the committee wishes to question the candidate privately.

ABSTRACT
-See next page-

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An ongoing problem for the study of Coxeter polyhedra is the classification and construction of such polyhedra in a hyperbolic setting be they finite volume, compact, or otherwise. Within this setting, we find Coxeter groups that may be represented as isometry groups acting on n -dimensional Lobachevsky space. This understanding differs significantly from the purely algebraic study of hyperbolicity for a Coxeter group, where the more varied conditions for parallel hyperplanes are suppressed in the group's presentation. Yet, in many cases, multiple polyhedra can be realized as the fundamental domain for a single Coxeter group up to isometry. We specifically investigate the formation of Coxeter polytopes with multiple parallel facets, relating the polytope's hyperbolicity to the eigen-structures and index of the polytope's gram matrix. We will show how this relation may be computed.