

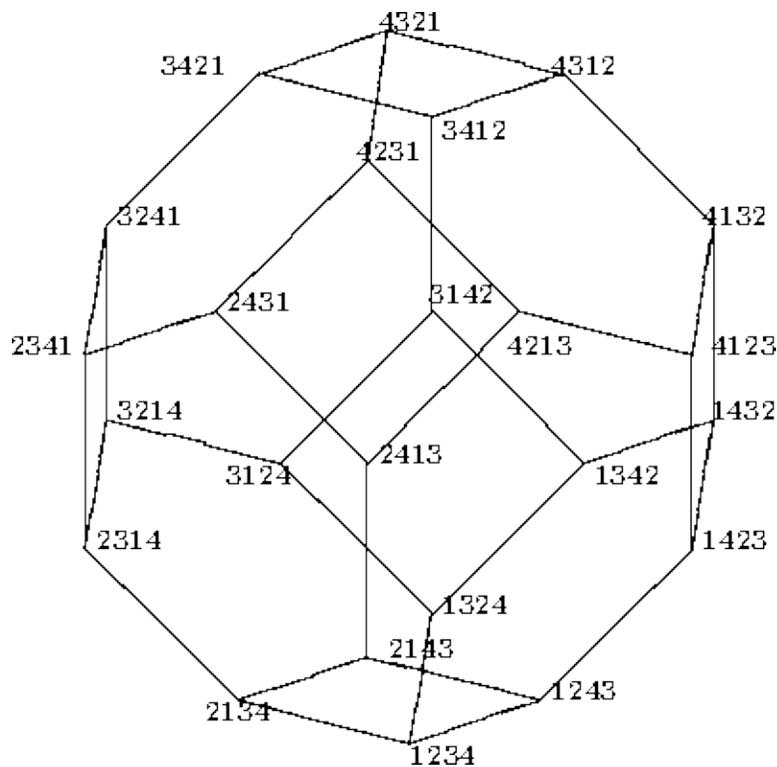
# Finite Groups of Matrices Over Infinite Fields

*(Pizza Provided)*

Wednesday, December 7<sup>th</sup>

**4:15-5:05, room 380C**

Professor Brian Conrad



## ABSTRACT:

The collection of all rigid motions of space preserving the origin (e.g., rotation around a line, reflection through a plane) is an example of a "matrix group": a (non-empty) collection of matrices stable under composition and inversion. The matrices that arise as rigid motions can be described by a simple explicit system of equations in the matrix entries, and they form an infinite group.

But this infinite group contains interesting **finite** subgroups! The determination of such finite groups is closely related to the classification of Platonic solids. After discussing some of that story, we discuss how to use number theory to give an upper bound on the size of a **finite** subgroup of a group of matrices with rational entries, and the optimality of such bounds.

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