

The SUMO Speaker Series for Undergraduates

(food from Pizza Chicago)

Wednesday, March 11th

5:15-6:15, room 380C

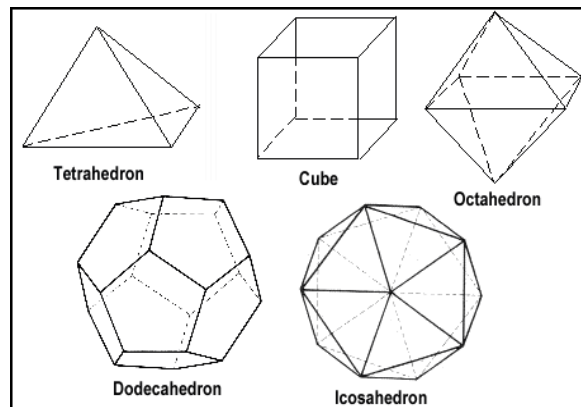
The 32 symmetries of crystal lattices

Zack Geballe (Berkeley)

ABSTRACT:

A solid forms when atoms arrange themselves periodically in 3 dimensions. A diamond, for example, is a periodic arrangement of carbon atoms. But diamonds are special because they have more organization than simple translational symmetry: the position of its atoms give a “faithful representation” of the tetragonal “point group”, one of the 32 symmetries that a crystal lattice can have.

After showing that there are exactly 32 crystallographic point groups, I will explain what an “irreducible representation” is, and then show how a crystal’s symmetry can help determine its material properties. In particular, I will give an example from geophysics that shows how math can be “useful” in predicting a 1% density increase 2000 kilometers below the earth’s surface!



sumo.stanford.edu/speakers