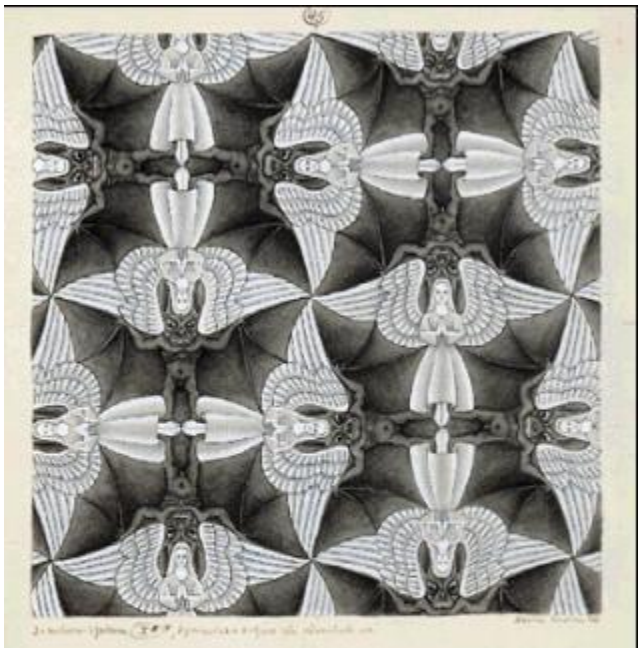
Introduction to Symmetry



My name: Evan Ortiz
Email: evortiz@ucdavis.edu
Time/Location: TBD depending on everyone's availability

Seminar Description: Symmetry is fundamental throughout the mathematical and physical worlds. In this seminar we will take a very hands on approach to understanding symmetry, and how to think about it mathematically, in particular as certain types of transformations. Most of our examples will come from geometric shapes in the xy-plane. The idea here is to be explorative, and build up our intuition for these transformation objects directly from the geometry in front of us.

We will be following the book *Groups and Symmetries* by David Farmer.

The seminar will be student led, meaning that students will take turns running the discussion. This might include a mini lecture about some interesting aspect of the book chapter we are on, some exercises to do as a group, a solution to a problem you're proud of, or any other idea you can come up with. The goal is to ask a lot of questions and get our hands a little dirty trying to answer them.

I will be available throughout the week for the presenter or anyone else to clarify any questions, help with ideas for seminar, or any other mathematical questions you may have.

There are no prerequisites. Mostly this is targeted towards first and second year students who are interested in what math looks like outside of calculus.

General Plan:

Week 1: Overview of plan for the quarter, and classroom expectations. Introduce ideas from chapter 1 about *legal moves* of lattices and grids.

Week 2: Rigid Motions of the plane

Week 3: Symmetries of shapes

Week 4: Strip patterns and wallpapers

Week 5: Wallpapers and groups

Week 6: Groups and permutations

Week 7: Cayley diagrams

Week 8-9: Flexible days depending on pace