Chaos, Fractals, and the Arts

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Porter College 34B, UCSC Winter 2016

# Tentative Syllabus by Week

- A.Vibrations and Forms
  - AI. Models of Consciousness
  - A2. Cymatics
  - A4a. Science and Consciousness (from A3)
  - A4b. Chaotic attractors
  - A5. Symmetric chaos
  - A6. Midterm

# Meeting #5, February 2

- HW-04 report, FN website
- Discussion
- Lecture
  - B. Plane symmetries, FG images
  - C. NetLogo FG models
- Projects

# Just Plane Symmetry

- Transformation (aka automorphism)
- Isomorphism
- Examples:
  - Translation
  - Rotation (invariant point)
  - Reflection (mirror line)
- Theorem

## Symmetries of a square

- Product, identity, inverse, group
- Symmetries of a square
- Zn, Dn groups



#### • 2D lattice

- Plane tesselation (aka tiling)
- Fundamental region (aka cell, tile)

## Field and Golubitsky

5 categoriesSquare quilts



### Field and Golubitsky

• Unit cell



### Porter 34B 2016 Meeting #5 The End