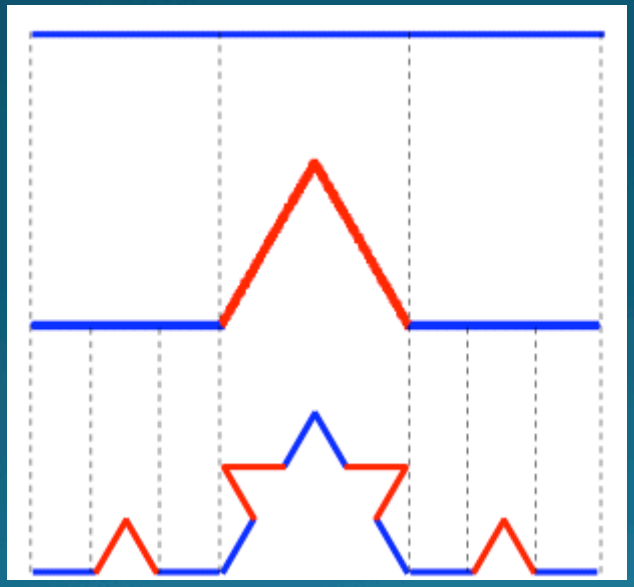
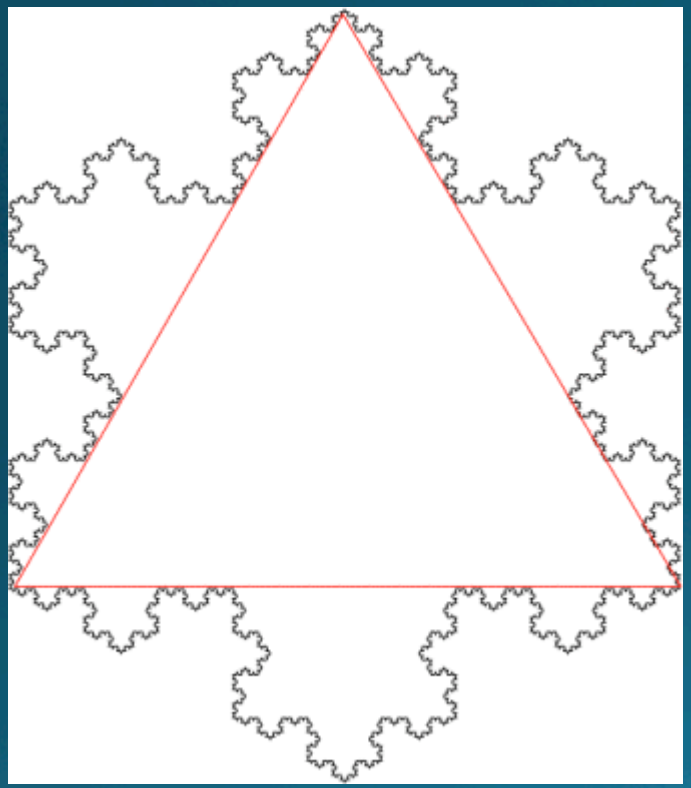

Koch Surf

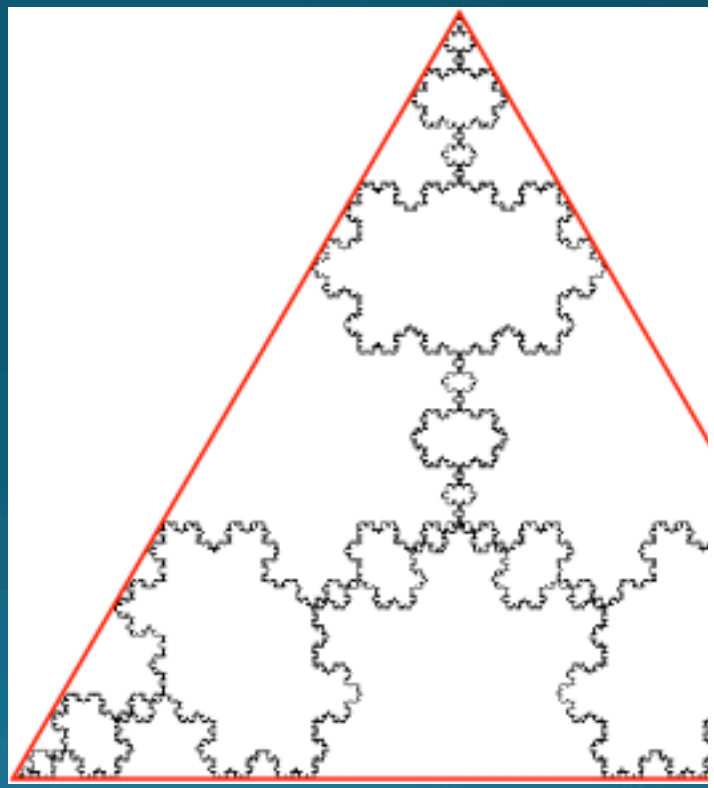
Koch Curves

Each line segment replaced with multiple, connected li



Koch Snowflake and Anti-Sno

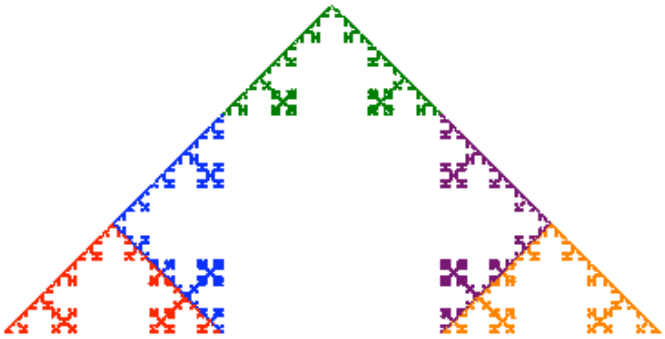




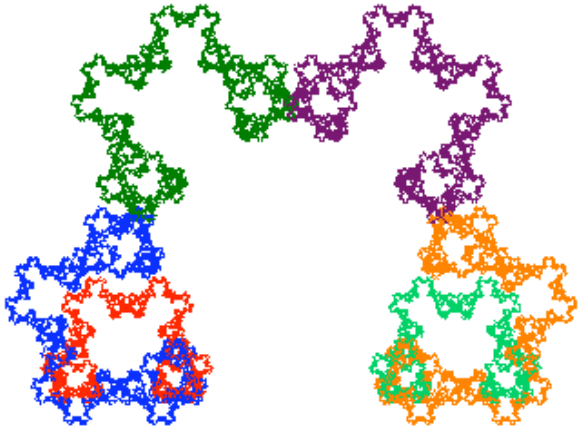
Customizability of Koch Cu

- (n,c)-Koch curve
- Start with a closed line segment of length *L* and a posi
  number *c* less than 1.
- Replace the middle *cL* portion of the segment with the
  regular *n*-gon whose own sides are length *cL*.

Some (n,c)-Koch curves



(4, 1/3)-Koch curve



(5, 0.4)-Koch curve

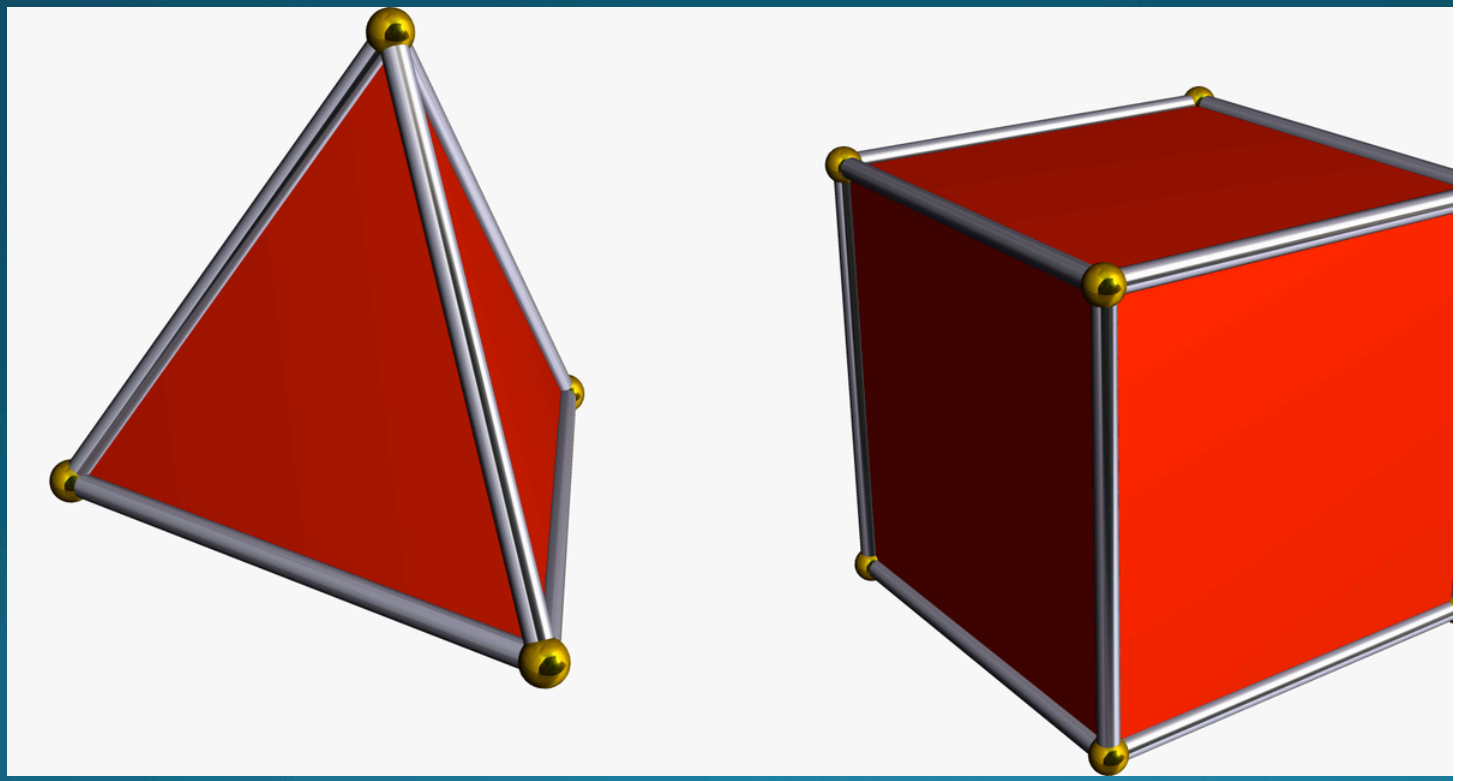
(6, 0.14)-Koch curve

Generalizing to 3D

- Instead of beginning with a polygon, we begin with a p
- In stead of replacing line segments, we replace polygo faces with more polygons
- http://tchaumeny.github.io/KochGL/

Customization of Koch Surf

- We start with one of the two most basic regular, con
  the tetrahedron and cube



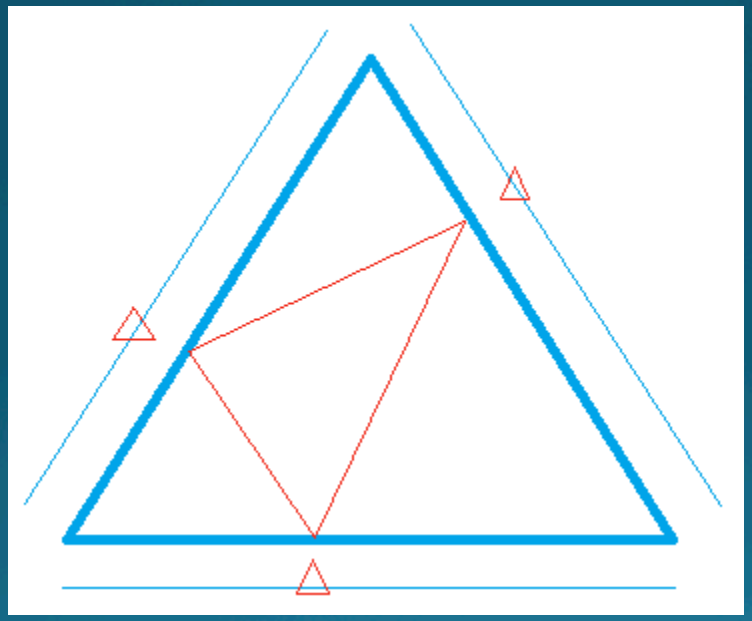
http://en.wi

From (n,c) to 3D

- We take the general idea behind (n,c)-Koch curves and it to three dimensions (in general terms)
- 'n' defines the overall shape of the recursively added p this will be limited
  - Tetrahedra (not necessarily regular) on triangles
  - Rectangular prisms on rectangles
  - Height is a user-defined constant times the height that wou average of the areas of the new faces equal to the removed
- 'c' defines the size of the replaced portion
  - Both size *and* position may be chosen when creating my Ko

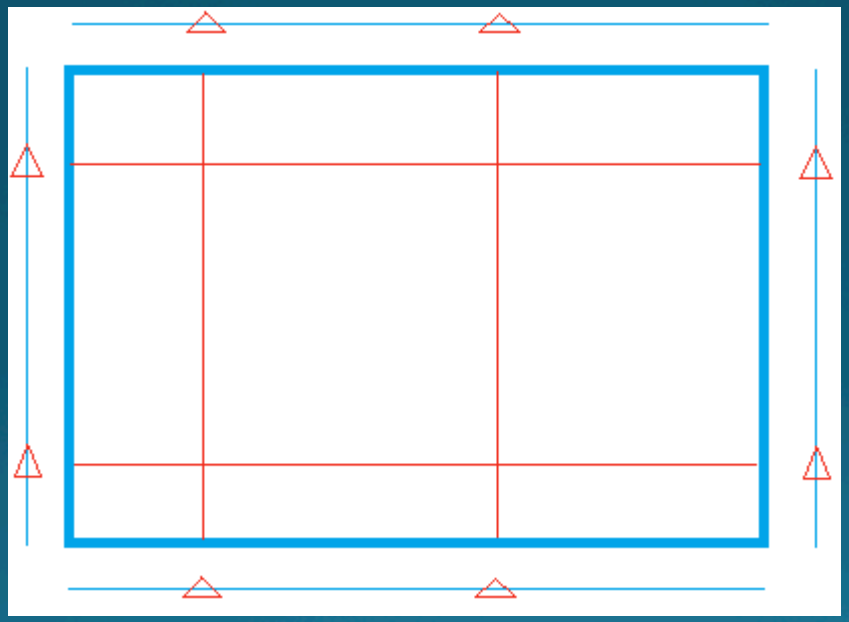
Customizing Triangular Fa

Applicable to the tetrahedron base shape



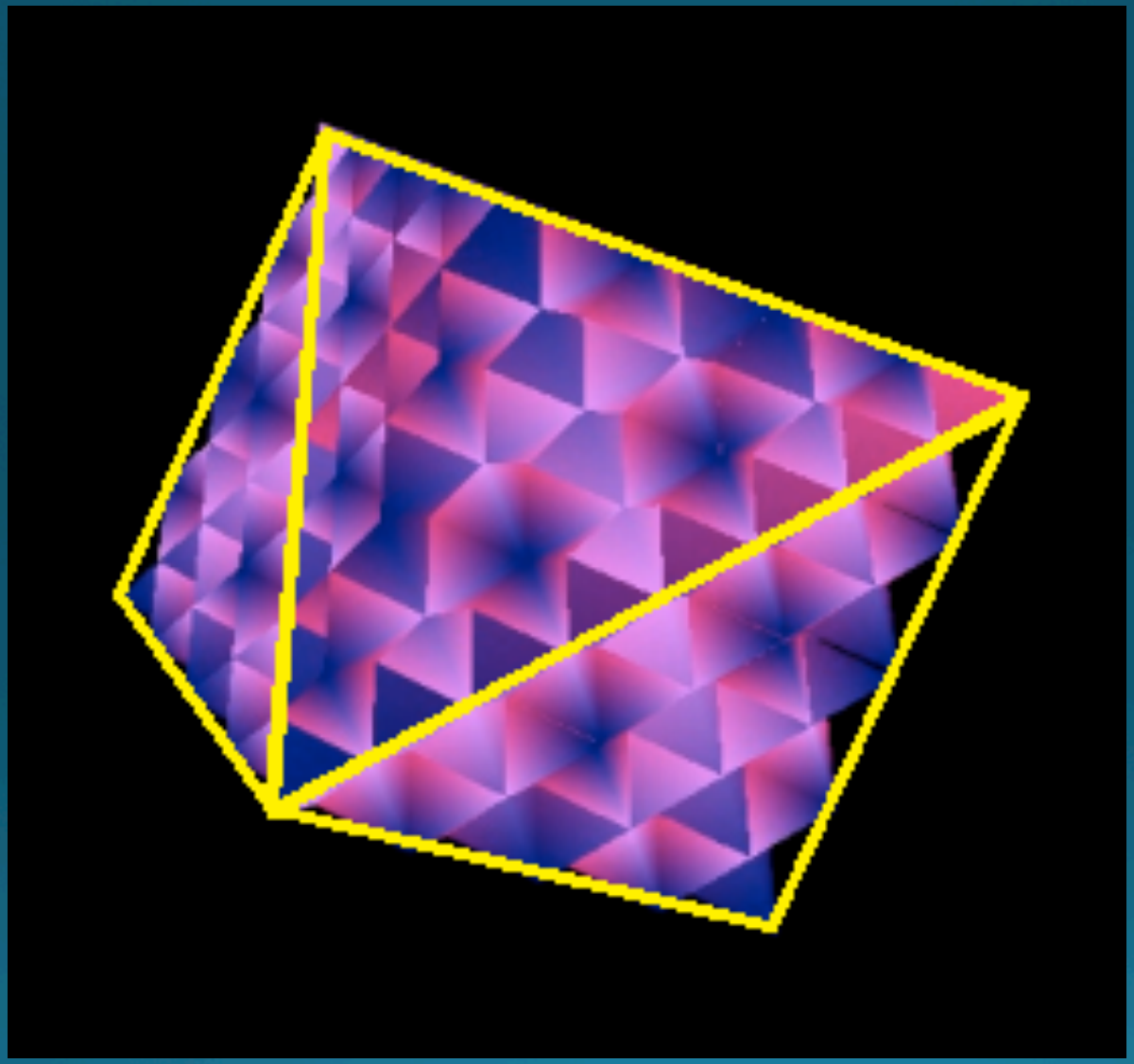
Customizing Rectangular F

Applicable to cubic base shape



Convergence

- Convergence of these fractals in 3D is not widely publi
- Yuliya noticed that a tetrahedron with regular tetrahe
  pattern visibly converges to an octahedron
- I will put a numerical score on this convergence by co
  fractal deep in its recursive construction to various reg
  polyhedra of the "same" size
  - I will choose the size of this regular polyhedron so that it ma
    convergence score



http://new.math.uiuc.edu/math198/MA198-2013/semibra