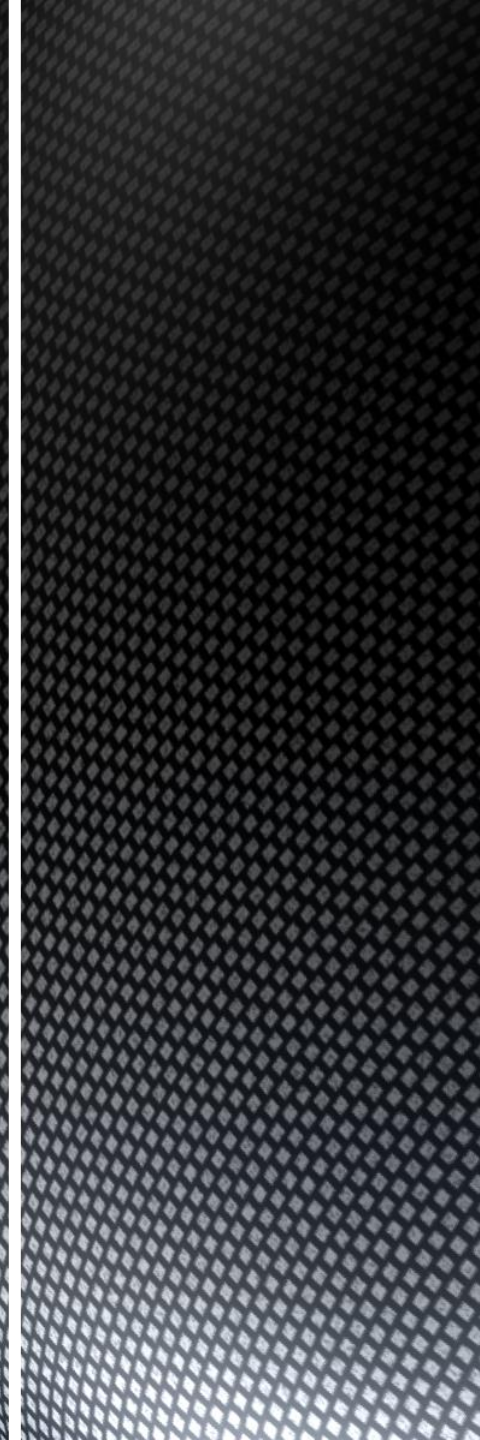


The $\{4,6|4\}$ Coxeter- Petrie Sponge

Kaison Tanabe

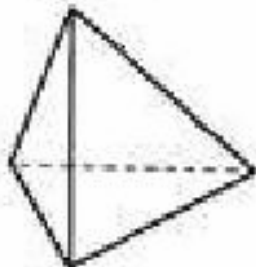


Regular polygons and polyhedra

The Basics

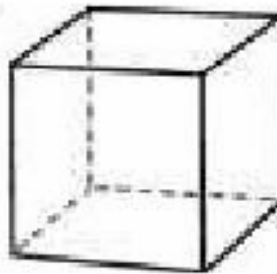
- 9 Finite
 - 5 Platonic (convex, regular)
 - 4 Star Kepler-Poinsot solids (concave, semi-regular)
- 6 Infinite
 - 3 plane-fillings
 - 3 sponges

15 Regular
Polyhedron



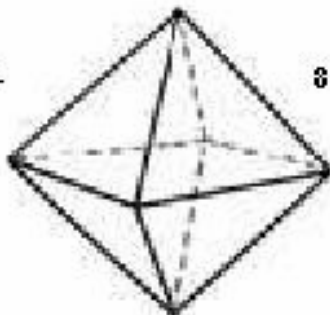
Tetrahedron

4 vertices. 6 edges. 4 faces.



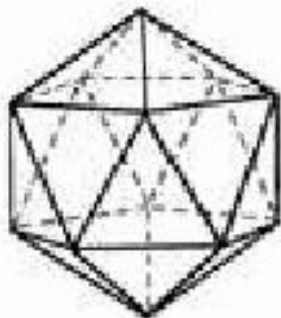
Cube

8 vertices. 12 edges. 6 faces.



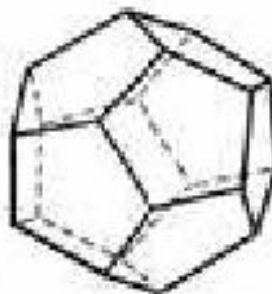
Octahedron

6 vertices. 12 edges. 8 faces.



Icosahedron

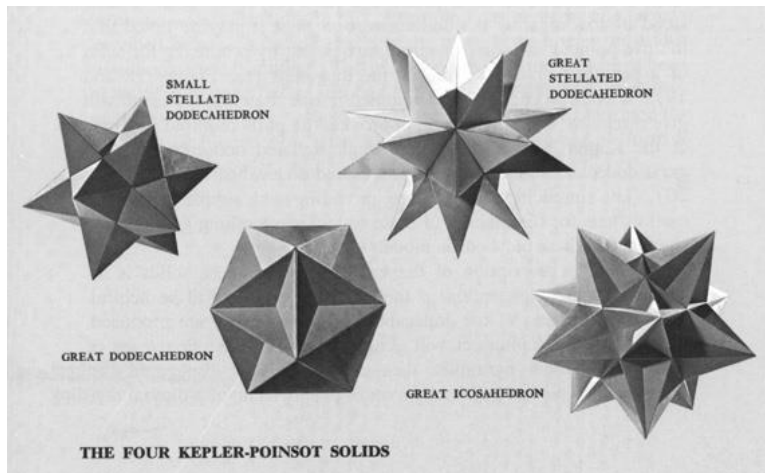
12 vertices. 30 edges. 20 faces.



Dodecahedron

20 vertices. 30 edges. 12 faces.

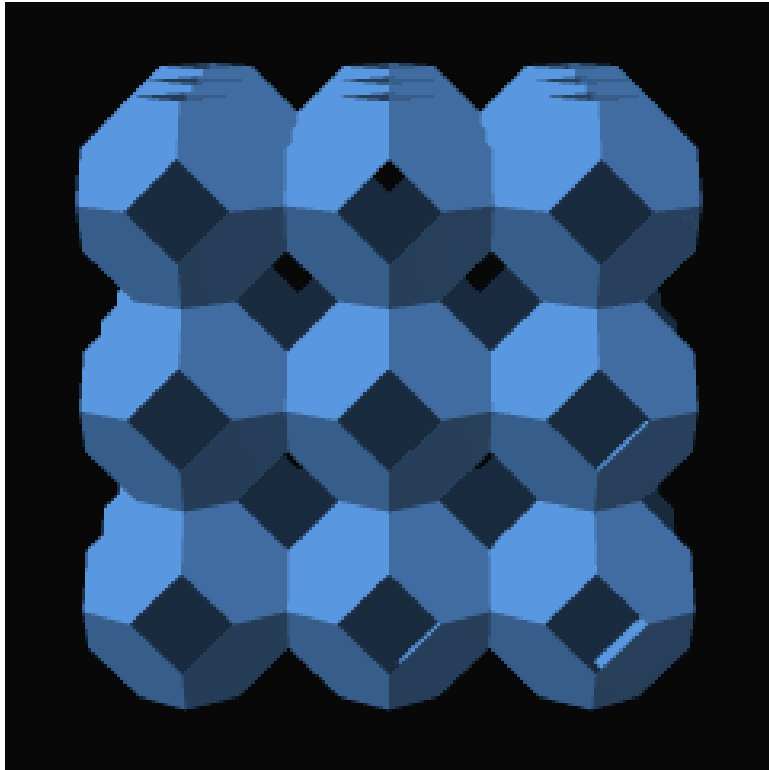
Platonic Solids



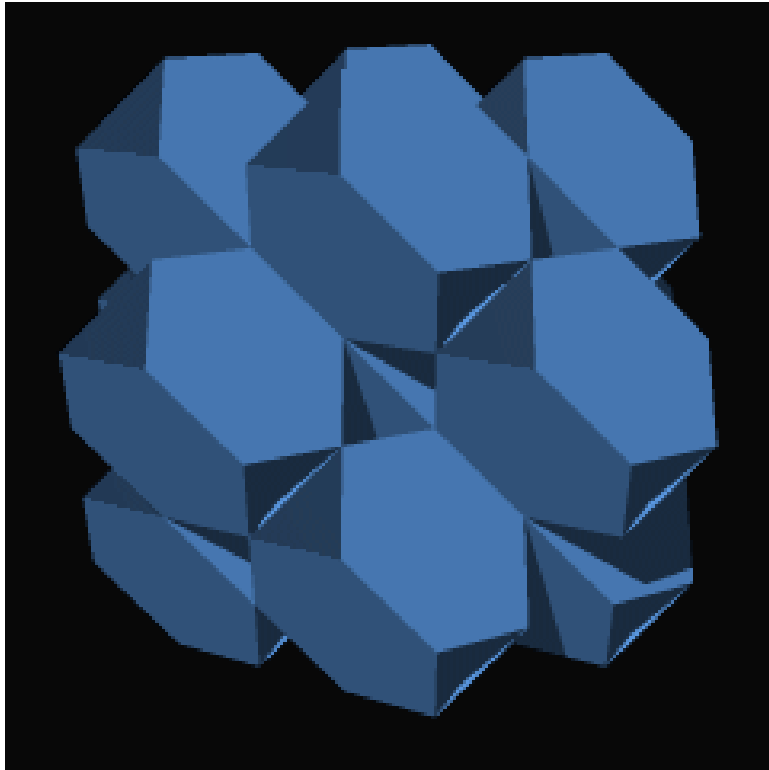
Kepler-Poinsot Polyhedra

- $\{l, m | n\}$: m regular l -gons around a vertex, with n -gonal holes.
- $2 \sin \frac{\pi}{l} \sin \frac{\pi}{m} = \cos \frac{\pi}{n}$
- $\{6, 6 | 3\}, \{4, 6 | 4\}, \{6, 4 | 4\},$
- $\{3, 6 | 6\}, \{6, 3 | 6\}, \{4, 4 | \infty\}$

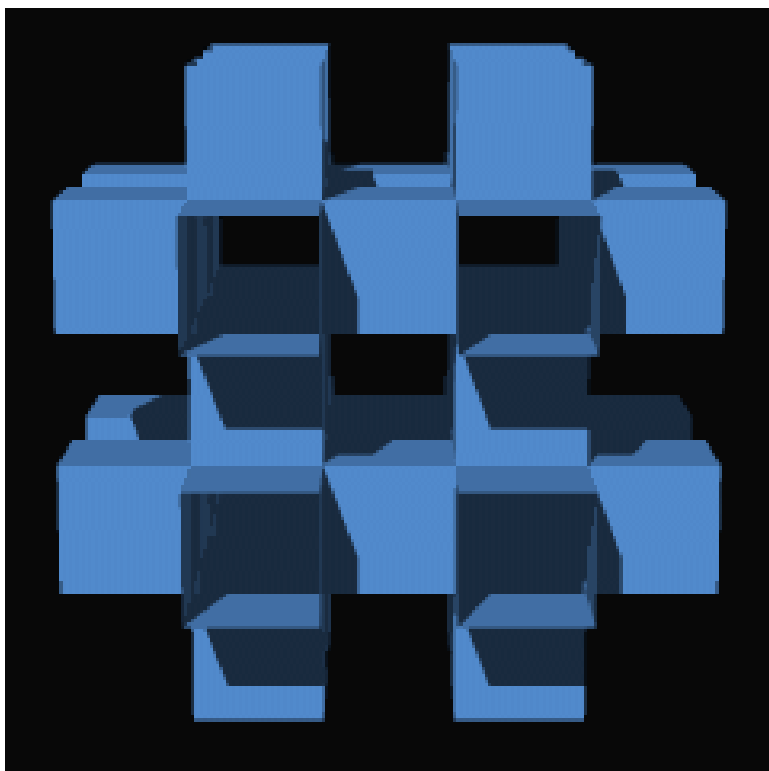
Regular Skew Polyhedron



$\{6,4|4\}$



$\{6,6|3\}$



$\{4,6|4\}$