

Mathematics: A Visual Feast

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JMU

April 13, 2011

Euclid's Elements

$$xy + \left(\frac{x-y}{2}\right)^2 = \left(\frac{x+y}{2}\right)^2$$



Figure: 300 B.C.E.

Euclid's Elements

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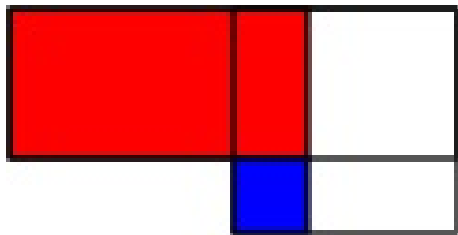


Figure:

<http://www.math.ubc.ca/~cass/euclid/papyrus/papyrus.html>

Euclid's Elements

$$xy + \left(\frac{x-y}{2}\right)^2 = \left(\frac{x+y}{2}\right)^2$$

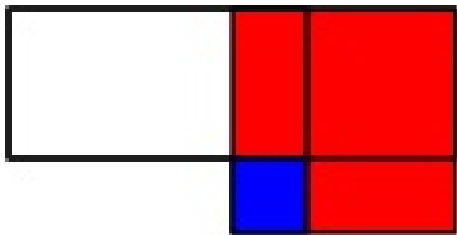


Figure:

<http://www.math.ubc.ca/~cass/euclid/papyrus/papyrus.html>

Uomo Vitruviano

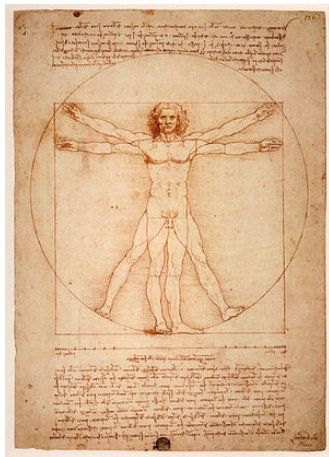


Figure: Leonardo da Vinci - circa 1487

School of Athens



Figure: Raffaello Sanzio - circa 1510

... and Hogarth

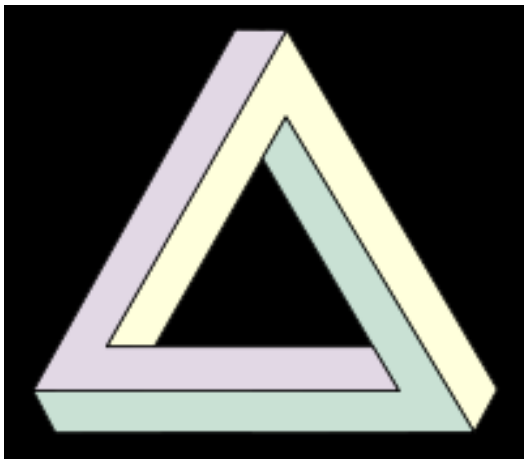
“Whoever makes a DESIGN without the Knowledge of PERSPECTIVE will be liable to such Absurdities as are shewn in this Frontitpiece” - John Kirby's *Linear Perspective* (1754)

... and Hogarth

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Penrose Triangle



M.C. Escher

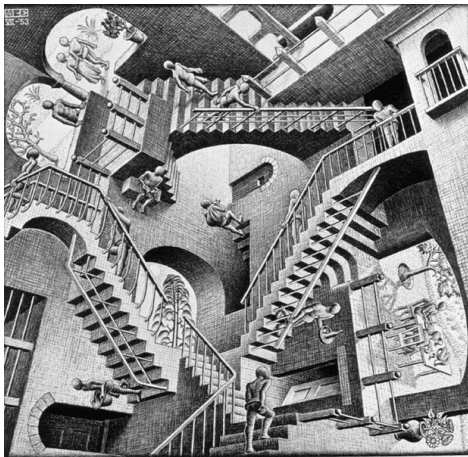


Figure: Relativity (1953)

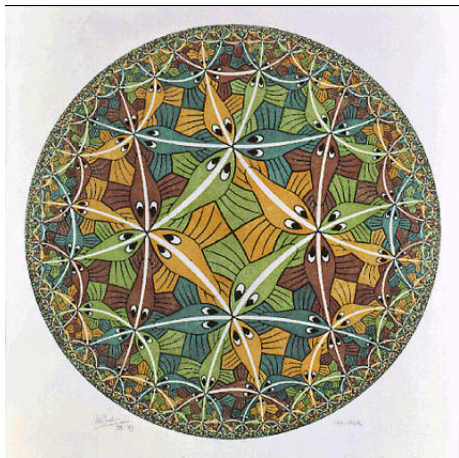


Figure: Circle Limit III (1959)

Hyperbolic Immersion



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Figure: Zack Treisman (2005)

Jenn3d

<http://www.math.cmu.edu/~fho/jenn/>

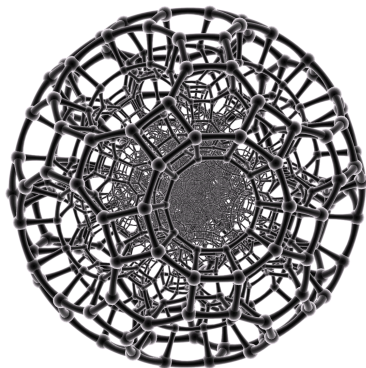


Figure: Fritz Obermeyer's Jenn3d Finite Coxeter Group

Bubbles



Bubbles

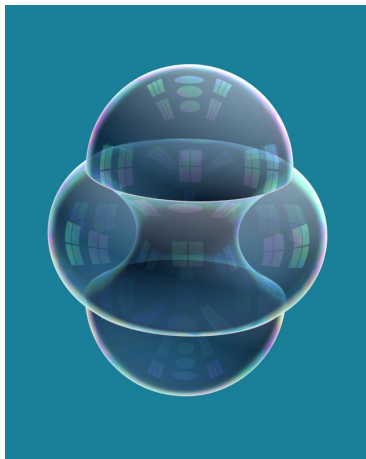


Figure: minimal surfaces

Bubbles

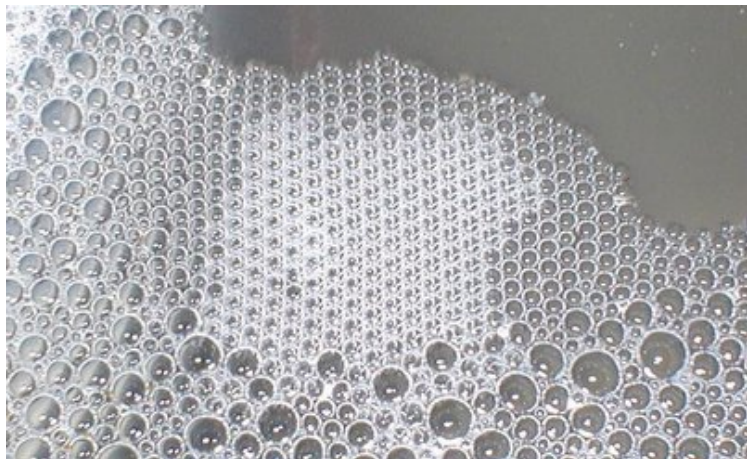


Figure: foam



Figure: Wave Field (1995) <http://www.plantext.bf.umich.edu/planner/sculpture/north/wave.htm>

Other Images

- ▶ Ripple Tank: <http://www.falstad.com/ripple/>
- ▶ Cornstarch:
<http://www.youtube.com/watch?v=3zoTKXXNQUIUa>
- ▶ Ferrofluid:
<http://www.youtube.com/watch?v=0E2pB1pyZNO>
- ▶ *E8* and Garrett Lisi's *Theory of Everything*
http://www.youtube.com/watch?v=y-Gk_Ddhr0M
- ▶ Impossible Objects:
<http://www.youtube.com/watch?v=hAXm0dIuyug>
- ▶ Air rings:
<http://www.youtube.com/watch?v=wNUgBsuIMwc>
- ▶ Smale's Paradox - sphere eversion:
<http://www.youtube.com/watch?v=I6cgca4Mmcc>

Thanks!

Möbius Transformation:

<http://www.youtube.com/v/JX3VmDgiFnY>