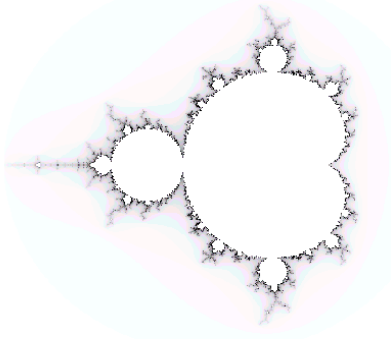


Naturaleza Fractal

José Luis Ramón Pérez
IES “Bajo Cinca” (Fraga)

Geometría Fractal

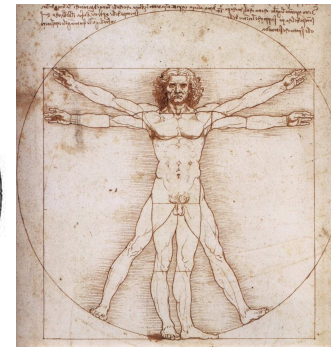
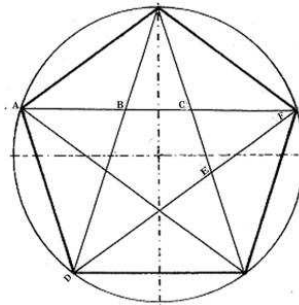


Mandelbrot 1975

Youtube: The hidden dimensión (la dimensión oculta)

- Dimensión Fractal (Fractalyse.exe)
- Autosimilaritud (LSE.exe IFS.exe)

Geometría Clásica

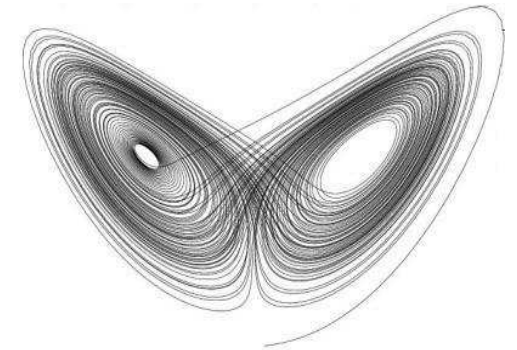


Euclides (300 aC)

Youtube : La razón áurea

- Regla y Compás
- Proporción

Geometría del Caos

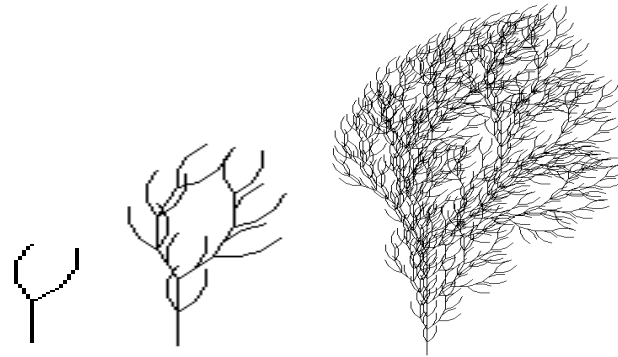


Lorentz 1963

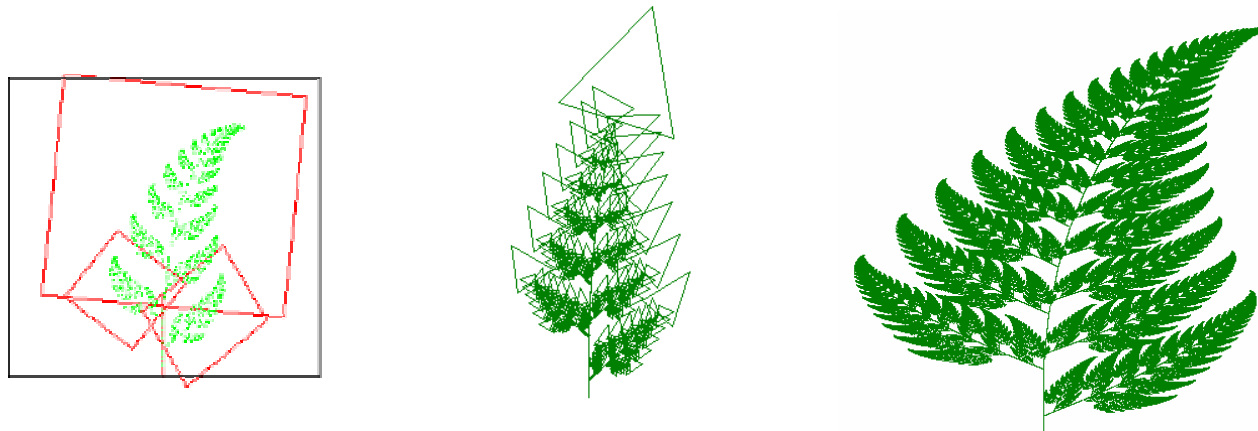
Youtube: Teoría del Caos

- Efecto Mariposa (pequeñas variaciones pueden producir efectos imprevisibles)
- Atractores Extraños (fractales) (Apophysis.exe)

L-Systems (Gramática Fractal) (LSE)

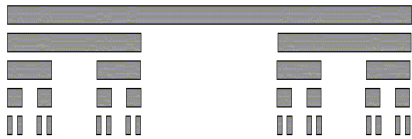


Sistemas de funciones Iteradas (IFS)

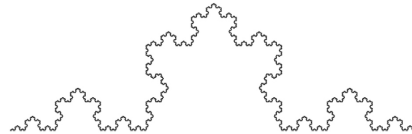


Fractales Clásicos

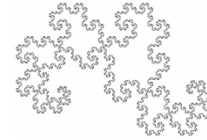
d=dimensión fractal



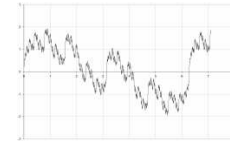
Conjunto de Cantor $d=0,6309$



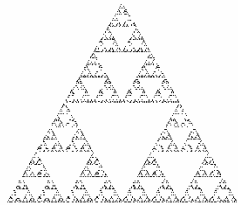
Curva de Koch $d=1,2619$



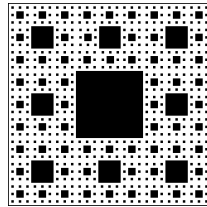
Curva de Dragón $d=1,5236$



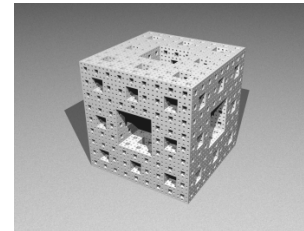
Función de Weierstrass $d=1.5$



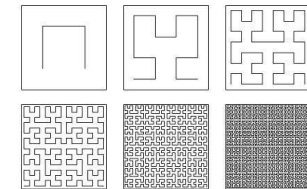
Triángulo de Sierpinski $d=1,5850$



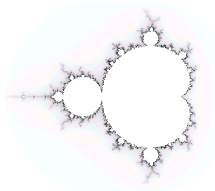
Alfombra de Menger $d= 1,8928$



Esponja de Menger $d=2,7268$



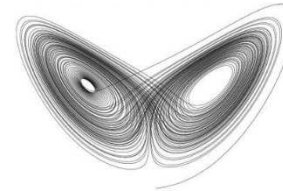
Curva de Peano $d =2$



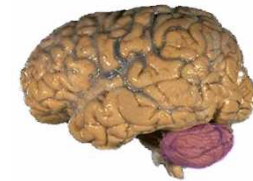
Conjunto de Mandelbrot $d=2$



Conjunto de Julia (Dendrita) $d= 1.2$



Atractor de Lorenz $d=2.06$



Superficie del cerebro $d=2.79$

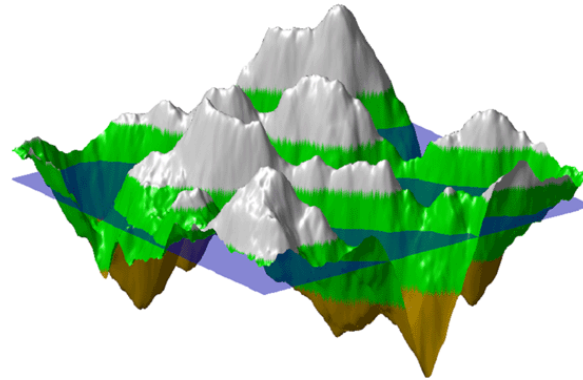
Taller Fractal



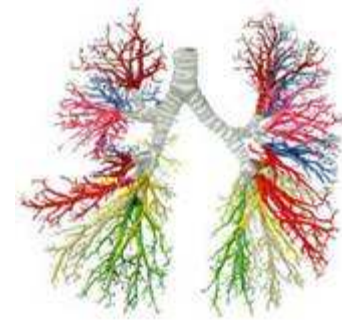
Realidad Fractal



Ciudad Fractal



Paisaje Fractal



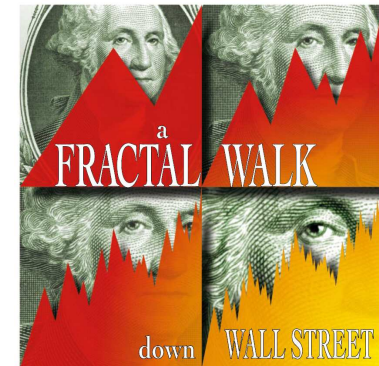
Pulmón Fractal



Rascacielos Fractales



Árbol Fractal



Economía Fractal