Exploring Fractal Geometry

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Abstract

This talk is on the history and application of fractal geometry. Topics will include discussions on fractals, where they are found, examples include: the make up of the human body, forms of music, architecture of African settlements, Islamic designs, perception of the mind, forms in art, plant structures, cosmology and even a section on their influence on pop culture. While at the University of California at Santa Cruz, the author founded Dynamic Software, producer of the graphics programs: Chaos, Fractasketch, Mandelmovie and Fractus; which will be demonstrated.

Fractal geometry is often referred to as the 'Geometry of Nature'. Until very recently natural structures seemed like they must be outside the scope of mathematics. Unlike the world of mathematics, the world of nature appeared random, haphazard, imprecise. We could recognize patterns in nature, as in the constellations of stars in the night sky, but we did not have a way of understanding why, or how, such patterns existed. We could not explain their geometry as we could the geometry of a square, or a cone. Fractal geometry represents the end of these limitations, by helping us understand the 'how' and the 'why' of natural structures. Using computer graphics we will be able to see what a fractal is in stunning detail and how it is created. Whether you're a first-time fractal adventurer or have a Ph.D. in Mathematics, we invite you to join this exploration.