

The Universal Fractal

Take a walk in nature and become immersed in its kaleidoscopes of pattern, order, and beauty. Trees, plants, rocks, clouds, nests, blades of grass, lichen, animals, crystals, snowflakes, the sun –each a precisely forged geometric pattern gleaming with an air of coherence, and organization.

Our universe is indeed an enchanted and exquisite wonder to behold, a virtual wonderland of infinitely dazzling patterns displaying remarkable degrees of regularity, orderliness, harmony, balance, and beauty hinting at the divine and touching our very souls.

The question naturally arises: How could so much order exist throughout the universe unless all its creations shared a common underlying design? How, without a consistent set of processes, could all of nature's creations end up being so well-formed, splendid, and beautiful? It is this and universality of form, this paper hopes to shed light. More specifically –the Universal Fractal proposes a common center-oriented pattern underlay most things. Not only –but because this pattern is present at all scales of being this pattern (i.e. Centerpatterns) qualifies as the Universal Fractal.

Fractals

Fractal science identified nature's tendency to produce creations whose internal structures share the same geometric pattern as the creation's overall geometric form (Mandelbrot, Benoit. *The Fractal Geometry of Nature*. New York: W.H. Freeman and Company, 1983. Print). A fractal entity sees the biggest and smallest –as well as all scales between, sharing the same shape. Merriam-Webster defines a fractal as “a rough or fragmented geometric shape that can be sub-divided in parts, each of which is a reduced copy of the whole. Fractals are generally self-similar and independent of scale.”

Fractal relationships can be readily gleaned in the form of a tree. When you look at the largest branches of a tree, you'll see their geometric shape is similar to the shape of the next smaller sized branches. Even the smallest twigs share this shape. It's the same as a river. No matter how closely you look, all its brooks, streams, and tributaries; share the same basic shape.

In summary --fractals exhibit the following two main properties. They are, first, self-similar: The smallest components of fractal creations are similar in form to all its larger scale structures. Second, fractals are independent of scale –i.e. you can find the same self-similar pattern at all scales of magnitude.

Do center-oriented patterns qualify as the Universal Fractal? I.e. are Centerpatterns are self-similar and universal (i.e. present at all scales of existence)? Let's take a closer look.

A Self-Similar Pattern

If you traced nature's creations backwards in time to their origin, what you'd find –just before it disappeared –would be its most essential element: its center; the place from which the creation began and from which it grew outward and expanded.

Thus it's no coincidence the overall pattern of nature's creations is shaped in center-oriented patterns –they grew symmetrically outward from their point of origin. In fact, when you view any of nature's creations holistically, you will see its overall organization has a general inward flow –a natural result of all its subcomponents aligning and being connected to the single point from which it began and grew outward.

Such center-oriented forms fill nature and man's worlds. They comprise the relentless inward curves of a spiral's arms, the pleasing symmetry of concentric circles, the spoke-like form of radials, the converging lines of arterial branching systems, and the swirls of vortices and whirlwinds. Self-similar patterns united through the common, center-oriented pattern they share.

If the reader is having difficulty visualizing the center oriented-ness of these geometries, the following Merriam Webster definitions shed additional light on their center-oriented disposition:

1. Circle and spheres: "...a center is the point that is equally distant from every point on the circumference of a circle or sphere."
2. Ellipses: "...the locus of points for which the sum of the distances from each point to two fixed points (i.e. a center) is equal."
3. Concentric circles: "...circles having a common center."
4. Spirals: "...winding around a center or pole and gradually receding from or approaching it."
5. Radials: "...characterized by divergence from a center."
6. Arterial branching system: "...a natural subdivision of a plant stem; especially a secondary shoot or stem (as a bough) arising from a main or center axis."
7. Vortex: "...a mass of fluid (as a liquid) with a whirling or circular motion that tends to form a cavity or vacuum in the center of the circle and to draw toward this cavity or vacuum bodies subject to its action."

In summary, we see through their common, center-oriented shape; Centerpatterns meet the fractal Quality of being "self-similar."

Universality

The following table demonstrates the presence of Centerpatterns at all the universe's various scales of being.

Device/Creation Description/Scale	Center-Oriented Shape	Center
Super-Universe (groups of universes)	Arterial branching system (Linde, Andrei. "The Self-Reproducing Inflationary Universe." Scientific American November 1994: 48-55. Print.)	Unknown (likely a main or originating branch or a Super-Sized Big Bang)
Universe	Spherical/cluster/radials	Big Bang
Superclusters	"Filamentary" sheets (arterial branching system)	Often a large cluster
Cluster groupings	"Lacy" and "filamentary" sheets (arterial branching system)	Domineering central mass
Clusters (groupings of galactic groupings)	Spherical/cluster	Gravitational center (often huge elliptical galaxies)
Galactic groupings	Spherical/cluster	Central galaxy
Galaxies	Spiral/elliptical/clusters	Black holes
Star clusters	Spherical/cluster	Gravitational center (often huge ancient stars)
Solar system	Spherical/elliptical	Star
Star/sun	Spherical	Gravitational center
Planet/moon and ringed planets	Spherical/elliptical	Gravitational center
Planet	Spherical	Gravitational center
Within planet Jet stream Water-vapor cycle Hurricanes Thunderstorm Cloud Tornados Lightning Mountains Volcanoes Trees and plants Waves	Vortex Loose cluster Spirals Well Spherical/cluster Spirals Arterial branching system Pyramidal Pyramidal Arterial branching system Clusters and spirals	Low pressure zone Ocean Low pressure zone Low pressure zone Updraft Low pressure zone Low voltage potential Peak Central lava flow Trunk Energy packet

Device/Creation Description/Scale	Center-Oriented Shape	Center
Human division of land International Groups of nations Country/nation State County City	Cluster Cluster Cluster Cluster Cluster Cluster	UN EU and NATO type alliances Nation's capital State capital County seat Capitol Hall
Human social structure Groupings Rituals Institutions Infrastructure Products	Cluster Cluster Cluster/arterial branching system Arterial branching system Cluster	Leader Central purpose Central leader/purpose/ meaning Main hub/branch Central purpose/function
Functioning of mind	See the separate paper entitled The Center Orienting Principle of Mind for details	
Language Books Chapters Paragraphs Sentence Words Letters	Cluster/whirlwind Cluster/whirlwind Cluster/whirlwind Cluster/whirlwind Cluster/whirlwind Cluster/whirlwind	Title Chapter title Main point Subject Meaning Tone
Life forms Organism Skeleton Digestive system Veins/arteries Nervous system Mind Organs Eyes	Spherical/cluster Arterial branching system Cluster/whirlwind Arterial branching system Arterial branching system Spherical/cluster Arterial branching system Spherical	Procreate To move/locomotion Stomach Heart/lungs Mind Consciousness Main trunk Fovea
Tissue	Cluster	Common section of DNA
Cells	Cluster/spherical	Nucleus
DNA	Helix	Cluster/whirlwind
Molecules	Cluster/rings/helix	"Electrical charge concentrated quantum mechanically between atoms" (Feynman, Hellman; Feynman-Hellman Theorem of Molecular Bonding.)
Atoms	Spherical/cluster	Nucleus
Subatomic particles	Spherical/cluster	Void

From the above table we can say center-oriented forms are present at all scales of structure in the universe –Centerpatterns are universal.

The Universal Fractal

The self-similarity of Centerpatterns combined with their universality demonstrates Centerpatterns qualify as the Universal Fractal. Indeed;

- The Universal Fractal is geometrically self-similar (i.e. nature and man's creations share a similar center-oriented pattern)
- The Universal Fractal is evident at all scales of magnitude (i.e. is universal)

The proposed Universal Fractal than satisfies the requirements of its title.

The presence of a center-oriented Universal Fractal (essentially a common pattern throughout the universe) reflects and thereby supports the findings presented in the paper entitled "The Center Organizing Principle". In other words, the presence of a common center-oriented pattern throughout the universe validates the existence of a universal center-oriented process since such a process is a necessary precursor to producing such center-oriented patterns.