Syntropy, Cosmology and Life

Ulisse Di Corpo[1] *and Antonella Vannini*[2]

Abstract

When the dual solution of the energy/momentum/mass equation of Einstein's special relativity is interpreted a cosmological representation of the universe governed by a diverging and a converging force and vibrating between peaks of expansion and concentration is obtained. During the diverging phase time flows forward, whereas during the converging phase time flows backward. In this representation causality and retrocausality constantly interact.

Introduction

The energy/momentum/mass equation of special relativity ($E^2=m^2c^4 + p^2c^2$), formulated by Albert Einstein in 1905, is a quadratic equation with two solutions, one positive with time moving forward and one negative with time moving backward. The negative solution was rejected as impossible since it implies retrocausality. However, listing the mathematical properties of the positive and negative solutions we find that the diverging solution is governed by the law of entropy, whereas the converging solution is governed by a law symmetrical to entropy which describes energy concentration, the increase in complexity, diversification, the growth of structures, organization and order.

In 1941 the mathematician Luigi Fantappiè coined the term *syntropy* (from Greek *syn*=converging, *tropos*=tendency) in order to describe the properties of the converging solution. In the same period the American physicist Robert Lindsay coined the term *negentropy*, which acquired a certain level of popularity in 1950 thanks to the work of Claude Shannon, Schrödinger and the equation on the transmission of information that the French physicist Léon Brillouin formulated in 1956.

Syntropy and negentropy are often confused, even though negentropy is defined as the opposite of entropy:

$$\text{Negentropy} = - \text{Entropy}$$

and syntropy as the complement to entropy:

$$\text{Syntropy} = 1 - \text{Entropy}$$

[1] ulisse.dicorpo@syntropy.org
[2] antonella.vannini@syntropy.org

The complementarity between syntropy and entropy, that is to say between the diverging and the converging forces, is masterfully represented in the Chinese symbol of Taijitu.

Figure 1 – Symbol of Taijitu

The interplay of these two basic and complementary forces would cause each aspect of reality to vibrate between peaks of syntropy and peaks of entropy. At the cosmological level this principle supports the theory of the Big Bang and of the Big Crunch. The Big Bang would be the outcome of the positive solution (entropy) namely energy and matter that diverge from an initial point of origin, whereas the Big Crunch would be the manifestation of the negative solution (syntropy) namely energy and matter that converge towards an end point of infinite density and temperature.

The Big Bang

The term "Big Bang" was coined by Fred Hoyle during a BBC radio broadcast in March 1949. The first formulation of the theory of the Big Bang, by Lemaître, dates back to 1927, but was generally accepted only in 1964, when most scientists were convinced that experimental data confirmed that an event like the Big Bang took place.

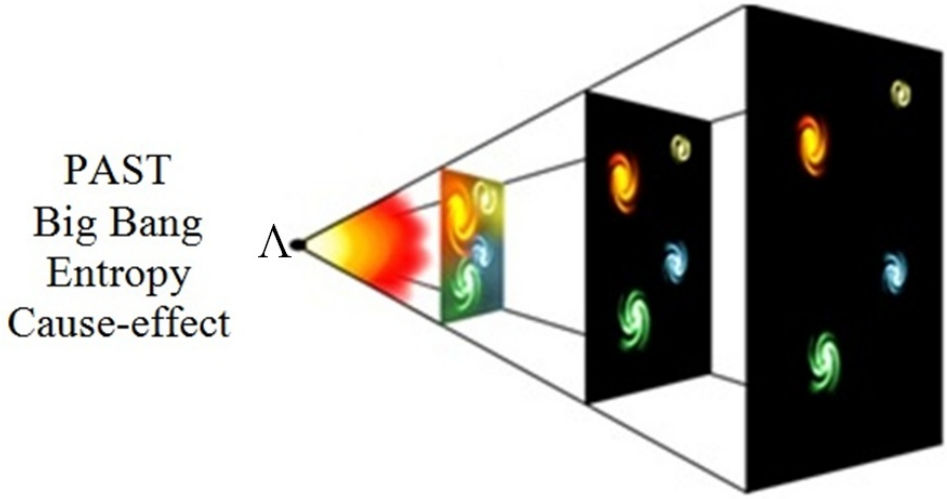

Figure 2 – The Big Bang

Georges Lemaître, a Belgian Catholic priest and physicist, developed the equations of the Big Bang and suggested that the distancing of the nebulae was due to the expansion of the cosmos. He observed a proportionality between distance and spectral shift (now known as Hubble's law). Edwin Hubble and Milton Humason showed that the distance of galaxies is proportional to their redshift, i.e. the shift towards lower frequencies of the light. This happens usually when the light source moves away from the observer or when the observer moves away from the source. More specifically, it is called "red shift" when, in observing the spectrum of light emitted from galaxies, quasars, or distant supernovae, it appears shifted to lower frequencies when compared with the spectrum of closer corresponding objects. Since the red color is the lowest frequency in visible light, the phenomenon received the name redshift, even though it is used in connection with any frequency, including radio frequency radiations. The redshift phenomenon indicates that galaxies are moving away from each other, and more generally that the Universe is in a phase of expansion. Redshift measurements show that galaxies and star clusters move away from a common point in space: the more distant they are from this point, the higher is their speed. Since the distance between galaxy clusters is increasing, it is possible to deduce, by going back in time, density and temperature increasingly higher until a point is reached where maximum values of density and temperature tend towards infinite values and the physical laws of the positive solution of the equations are no longer valid.

The Big Crunch

In cosmology, the Big Crunch is a hypothesis on the fate of the universe. This hypothesis is exactly symmetrical to the Big Bang and maintains that the universe will stop expanding and begin collapsing on itself.

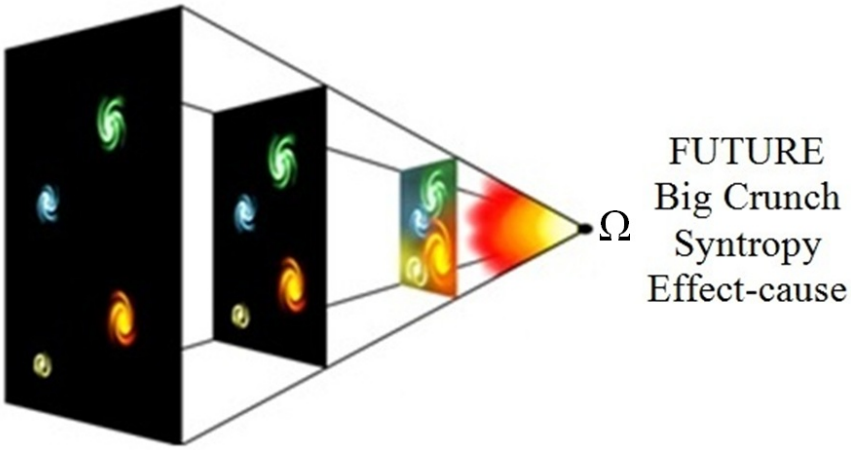

Figure 3 – The Big Crunch

According to the Big Crunch hypothesis the mutual gravitational attraction of all the matter of the universe will eventually cause the universe to contract. The strength of the gravitational force will stop the universe from expanding and the universe will collapse back on itself. The contraction would appear very different from the time reversal of the expansion. While the early universe was highly uniform, a contracting universe would become increasingly diversified and complex. Eventually all matter would collapse into black holes, which would then coalesce producing a unified black hole or Big Crunch singularity.

The theory of the Big Crunch proposes that the universe could collapse to the state where it began and then initiate another Big Bang, so in this way the universe would last forever, but would pass through phases of expansion (Big Bang) and contraction (Big Crunch).

Is the expansion of the universe accelerating or is time slowing down?

Recent evidence, namely the observation of distant supernova, has led to the speculation that the expansion of the universe is not being slowed down by gravity but rather accelerating. In 1998 the measurement of the light from distant exploding stars lead to the conclusion that the universe is expanding at an accelerating rate. The observation of the redshift-luminosity of supernovae suggests that supernovae are spreading apart faster as the universe ages. According to these observations the universe appears to be expanding at an increasing rate. These observations contradict the hypothesis of the Big Crunch.

In the attempt to explain these observations physicists have introduced the idea of dark energy, dark fluid or phantom energy. The most important property of dark energy would be that it has a negative pressure which is distributed relatively homogeneously in space, a kind of anti-gravitational force which is driving the galaxies apart. This mysterious antigravitational force is considered to be a cosmological constant or vacuum energy which will lead the universe to expand exponentially. However, to this day no one actually knows what dark energy is, or where it comes from.

On the contrary the interpretation of the energy/momentum/mass equation suggests that the observed increase in the rate of expansion of the universe would not be due to the effect of dark energy or to any mysterious antigravitational force, but to the fact that time is slowing down.

In June 2012 Professor José Senovilla, Marc Mars and Raül Vera of the University of the Basque Country, Bilbao, and the University of Salamanca, Spain, published a paper in the journal *Physical Review D* in which they dismiss dark energy as fiction. Senovilla says that the acceleration is an illusion which is caused by time itself gradually slowing down: "*We do not say that the expansion of the universe itself is an illusion*," he explains, "*what we say is that the acceleration of this expansion - that is, the possibility that the expansion is, and has been, increasing its rate – is an illusion*.[…] *we naively kept using our equations to derive the changes of the expansion with respect of 'a standard flow of time', then the simple models that we have constructed in our paper show that an effective accelerated rate of the expansion takes place*." The corollary of Senovilla's team is that "dark energy" does not exist. The team proposes that there is no such thing as dark energy at all and that we have been fooled into thinking the expansion of the universe is accelerating, when in reality, time itself is slowing down. At an everyday level, the change would not be perceptible. However, it would be obvious from cosmic scale measurements tracking the course of the universe over billions of years. The change would be infinitesimally slow from a human perspective, but in terms of cosmology, the study of light from stars that exploded billions of years ago, it could easily be measured. Currently, astronomers discern the expansion speed of the universe using the so-called "red shift" technique. This technique relies on the understanding that stars moving away appear redder in color than those moving towards us. Scientists look for supernovae of certain types that provide a sort of benchmark. However, the accuracy of these measurements depends on time remaining invariable throughout the universe. If time is slowing down it turns into a space dimension. Therefore the far-distant, ancient stars seen by cosmologists would look as though they were accelerating. "*Our calculations show that we would think that the*

expansion of the universe is accelerating," says Prof Senovilla. Though radical and in many way unprecedented, these ideas are not without support. Gary Gibbons, a cosmologist at Cambridge University, says the concept has merit. "*We believe that time emerged during the Big Bang, and if time can emerge, it can also disappear - that's just the reverse effect.*"

Cycles of Big Bang and Big Crunch

The Big Crunch hypothesis states that the cohesive and converging forces, such as the force of gravity, will stop the expansion of the universe, and then bring all matter and energy to converge into a gravitational singularity in which the laws of the negative solution are no longer valid, since the parameters tend to zero. When the singularity is reached time reverses again giving rise to a new Big Bang. The universe would thus be oscillating in an infinite sequence of cycles of Big Bang and Big Crunch moving forward and backward in time.

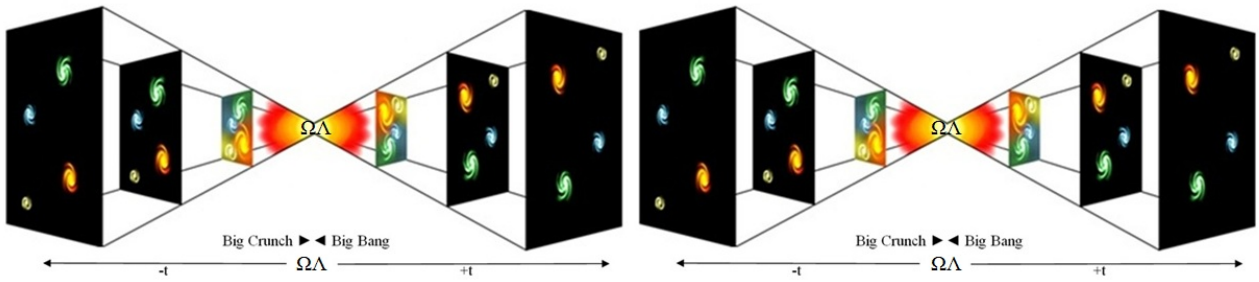

Figure 4 – Big Bang and Big Crunch cycles

In figure 4 the Big Bang is indicated with the first letter of the Greek alphabet, Λ = Alpha (the Beginning), whereas with the letter Ω = Omega (the End) the Big Crunch is symbolized.

In the diverging phase of the Big Bang time moves forward, whereas during the converging phase of the Big Crunch time moves backward and at the instant of singularity, i.e. the maximum concentration of matter and energy, time stops.

During the diverging phase the forward flow of time decelerates and halts when the expansion of the universe halts. Time then starts flowing backward at an always increasing rate when the universe converges into the Big Crunch.

Matter and antimatter

According to the fundamental equations during the Big Bang there was exactly as much matter and antimatter. The question that is often heard among cosmologists is why we live in a world predominantly made of matter. What has happened to antimatter?

When the negative solution of the energy/momentum/mass equation is properly interpreted, this question is solved, since anti-matter would move backward in time. Consequently, at the moment of the Big Bang the amount of matter and anti-matter would have been the same, but antimatter immediately started to diverge backward in time, whereas matter began to diverge forward in time, distancing instantly and preventing annihilation. Consequently, according to this interpretation, the universe is composed of an equal amount of matter and antimatter, but these two aspects of reality

move in opposite time directions. But, since the Big Bang will change into a Bing Crunch, in which the time direction is reversed, these two time symmetrical planes constantly interact in the form of a continuous interplay between diverging and converging forces, causality and retrocausality. According to this interpretation, all what is diverging is governed by the positive solution (the law of entropy), whereas all what is converging is governed by the negative solution (the law of syntropy).

Therefore the physical and material plane would interact continuously with the non physical and intangible plane of antimatter which moves backward in time. The inherent complexity of the physical Universe would be a consequence of the interaction of matter and energy with the cohesive forces of anti-matter and anti-energy.

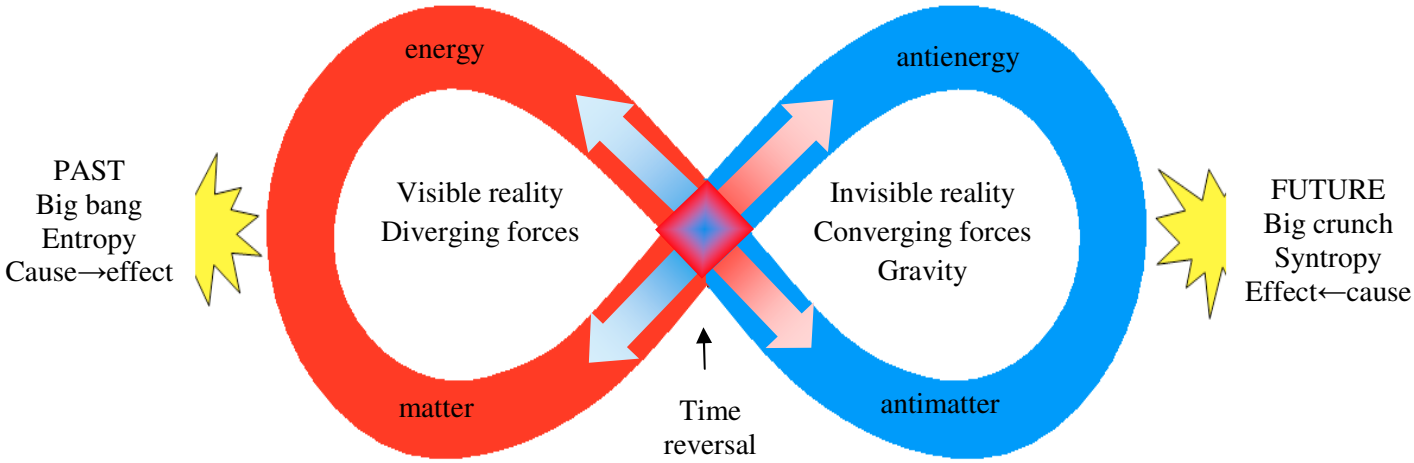

Figure 5 - Graphical representation of the cosmological interpretation of the energy/momentum/mass equation

Gravity

We continuously experience gravity, but even to the brightest minds in science it remains a mystery. Scientists don't know why there's gravity. According to the interpretation of the negative solution of the energy/momentum/mass equation gravity is a diverging force which flows backward in time. Since we move forward in time this backward diverging force is for us a forward converging force. Equations show that forward diverging forces cannot exceed the speed of light, whereas backward diverging forces can never propagate at speeds lower than that of light.

Consequently, if the syntropy model is correct, we should observe that gravity propagates at a instantaneous speed. This would contradict the standard model of particle physics that states that gravity is caused by massless particles called gravitons that emanate gravitational fields. Gravitons tug on every piece of matter in the universe and prevent gravity from propagating at speeds higher than that of light.

But, can we perform experiments in order to measure the speed of propagation of gravity in order to test which of the two models is correct?

The answer has been provided by Tom van Flander (1940-2009), an American astronomer

specialized in celestial mechanics. Van Flander noted that no aberration is observed when measuring gravity and that this puts the propagation of gravity at a speed higher than 10^{10} the speed of light.

With light the aberration is due to its limited speed. For example light from the Sun requires about 500 seconds to travel to Earth. So when it arrives, we see the Sun in the sky in the position it actually occupied 500 seconds ago rather than in its present position. This difference amounts to about 20 seconds of arc, a large and noticeable amount to astronomers. From our perspective, the Earth is standing still and the Sun is moving. So it seems natural that we see the Sun where it was 500 seconds ago, when it emitted the light now arriving. Consequently the light from the Sun strikes the Earth from a slightly displaced angle and this displacement is called aberration. Light aberration is due entirely to the finite speed of light.

If gravity would propagate with a finite speed we would expect gravity aberration. The Sun's gravity should appear to emanate from the position the Sun occupied when the gravity now arriving left the Sun. The Earth should "run into" the gravitational force, making it appear to come from a slightly displaced angle equal to the ratio of the Earth's orbital speed to the speed of gravity propagation. But observations indicate that none of this happens in the case of gravity! There is no detectable delay for the propagation of gravity from Sun to Earth. The direction of the Sun's gravitational force is toward its true, instantaneous position, not toward a retarded position, to the full accuracy of observations. Gravity has no perceptible aberration and this tells that it propagates with infinite speed.

Van Flander notes that gravity has some curious properties. One of them is that its effect on a body is apparently completely independent of the mass of the affected body. As a result, heavy and light bodies fall in a gravitational field with equal acceleration. Another is the seemingly infinite range of gravitational force. Truly infinite range is not possible when forces are conveyed forward in time. The other curious property of gravity is its instantaneous action and propagation which can be explained only if we accept that gravity is a backward in time diverging force.

Van Flander's experiments discard the hypothesis of massless particles called gravitons and support the hypothesis formulated by the syntropy model. An other explanation to gravity is now provided with the Higgs boson. However, Sheldon Glashow, winner of the 1979 Nobel Prize in Physics, once called the Higgs boson the "toilet" of the standard model since its only function is to keep the standard model functioning, at least in an intellectual way. The Higgs boson is required to try to explain gravity and the other forces involving mass, but in its mathematical formulation is highly contradictory.

In the rigorous world of high-energy physics, researchers wait to see a 5-sigma signal, which has only a 0.000028 percent probability of happening by chance, before claiming a "discovery." However, with the Higgs boson researchers accepted to lower the probability to a 4 sigma signal, claiming a "discovery" which instead could probably be the outcome of pure chance.

The syntropy model states that gravity is the outcome of the negative solution of the fundamental equations. This solution has always been rejected by physicists since it contradicts the assumption that causes must always precede effect. The syntropy model implies a change of paradigm which would replace the mechanistic paradigm with a new supercausal paradigm. Billions are spent on the standard model of particle physics in order to maintain the old mechanistic paradigm, whereas researchers studying retrocausality or supercausality are deprived from any financial support.

The three levels of time

In order to better understand the implications of syntropy it is important to note the three typologies of time which the fundamental equations predict:

- *Causal time*, is expected in diverging systems, such as our expanding universe, governed by the properties of the positive solution of the equations. In diverging systems entropy prevails, causes always precede effects and time moves forward, from the past to the future. Since entropy prevails, no advanced effects are possible, such as light waves moving backward in time or radio signals being received before they are broadcasted.
- *Retrocausal time*, is expected in converging systems, such as black-holes, and it is governed by the properties of the negative solution of the equations. In converging systems retrocausality prevails, effects always precede causes and time moves backward, from the future to the past. In these systems no forward effects are possible and this is the reason why no light is emitted by black-holes.
- *Supercausal times* would characterize systems in which diverging and converging forces are balanced. An example is offered by atoms and quantum mechanics. In these systems causality and retrocausality would coexist and time would be unitary: past, present and future would coexist.

This classification of time recalls the ancient Greek division in: *kronos*, *kairos* and *aion*.

- *Kronos* describes the sequential causal time, which is familiar to us, made of absolute moments which flow from the past to the future.
- *Kairos* describes the retrocausal time. According to Pitagora *kairos* is at the basis of intuition, the ability to feel the future and to choose the most advantageous options.
- *Aion* describes the supercausal time, in which past, present and future coexist. The time of quantum mechanics, of the sub-atomic world.

Quantum mechanics

December 14 1900 is now remembered as the date when quantum mechanics started. However, Planck himself remained skeptical of his own discovery since he was not able to answer the question "why a quantum?" This question has not received an answer yet and remains one of the fundamental mysteries of quantum mechanics.

The dual solution of the fundamental equations suggests that in atomic systems, where the converging and diverging forces are balanced, a rapid sequence of diverging and converging phases (Big Bang and Big Crunch) takes place. Since during the diverging phase time moves forward and during the converging phase time moves backward, for an observer located in the macrocosm level the quantum time would be unitary: past, present and future would coexist. However, according to this model, atoms can emit energy only during the diverging phase and absorb energy only during the converging phase, resulting in the quantization of energy emissions and energy absorption. Each diverging and converging cycle coincides with a Planck unit.

Furthermore the dual solution explains the wave/particle duality as a consequence of the duality between causality and retrocausality. Since past is already determined, causality would behave as a particle, but since the future is not yet determined retrocausality would behave as a probability wave. The distinction between determinism and probability helps to understand the difference between mathematics and statistics. Statistics is based on the study of probability, whereas mathematics is based on the study of deterministic systems. Consequently, when dealing with causality mathematics is used, but when dealing with retrocausality or supercausality statistics is required. This is why quantum mechanics requires the use of probability.

Following the classical interpretation of time, in which causality can only flow from the past to the future, the wave/particle duality of matter is explained by saying that matter propagates as a wave and when it is observed the wave collapses into a particle. When accepting the idea of retrocausality and supercausality the collapse of the wave function is not any more necessary, since the wave and particle aspects constantly coexist and interact.

Finally, the syntropy model considers atoms to be infinitely small universes and rejects the representation of the Standard Model based on 17 different types of particles. Likewise, our universe would be nothing else than an atom of an even bigger universe. Atoms in atoms, universes in universes, like Chinese boxes that progress from the infinitely small to the infinitely large.

Life and water

According to the dual solution of the fundamental equations, syntropy and entropy coexist at the quantum level of matter, i.e. the Aion level, and at this level life can originate. A question naturally arises: how do the properties of syntropy pass from the quantum level of matter to the macroscopic level of our physical reality transforming inorganic matter into organic matter? In 1925 the physicist Wolfgang Pauli (1900-1958) discovered in water molecules the hydrogen bridge (or hydrogen bonding). Hydrogen atoms in water molecules share an intermediate position between the sub-atomic level (quantum) and the molecular level (macrocosm), and provide a bridge that allows syntropy (cohesive forces) to flow from the quantum level to the macroscopic level. The hydrogen bridge makes water different from all other liquids, increasing its cohesive forces (syntropy), with attractive forces ten times more powerful than the van der Waals forces that hold together other liquids and with behaviors that are in fact symmetrical to those of other liquid molecules. For example:

- When it freezes water expands and becomes less dense. Other liquid's molecules, when they are cooled, concentrate, solidify, become more dense and heavy and sink. With water exactly the opposite is observed.
- In liquids the process of solidification starts from the bottom, since hot molecules move towards the top, whereas cold molecules move towards the bottom. The liquid in the lower part is therefore the first which reaches the solidification temperature; for this reason liquids solidify starting from the bottom. In the case of water exactly the opposite happens: water solidifies starting from the top.
- Water shows a heat capacity by far greater than other liquids. Water can absorb large quantities of heat, which is then released slowly. The quantity of heat which is necessary to change the temperature of water is by far greater than what it is needed for other liquids.
- When compressed cold water becomes more fluid; in other liquids, viscosity increases with pressure.

- Friction among surfaces of solids is usually high, whereas with ice friction is low and ice surfaces result to be slippery.
- At near to freezing temperatures the surfaces of ice adhere when they come into contact. This mechanism allows snow to compact in snow balls, whereas it is impossible to produce balls of flour, sugar or other solid materials, if no water is used.
- Compared to other liquids, in water the distance between melting and boiling temperatures is very high. Water molecules have high cohesive properties which increase the temperature which is needed to change water from liquid to gas.

Water is not the only molecule with hydrogen bridges. Also ammonia and fluoride acid form hydrogen bridges and these molecules show anomalous properties similar to water. However, water produces a higher number of hydrogen bridges and this determines the high cohesive properties of water which link molecules in wide dynamic labyrinths.

Other molecules that form hydrogen bonds do not reach the point of being able to build networks and broad structures in space. Hydrogen bonds impose structural constraints extremely unusual for a liquid. One example of these structural constraints is provided by crystals of snow. However, when water freezes the hydrogen bonds mechanism stops and also the flow of syntropy between micro and the macrocosm stops, bringing life to death.

Hydrogen bonds make water essential for life, water is ultimately the lymph of life which provides living systems with syntropy. If life were ever to start on another planet, it would certainly require water. Water is the only mean by which life draws syntropy from the quantum level of matter. Consequently, it is the indispensable element for the origin and evolution of any biological structure. The singularity of water resides, almost entirely, in its attractive properties. Other molecules that form hydrogen bonds, in fact, do not reach the point of being able to build networks and broad structures in space. Hydrogen bonds impose structural constraints which are extremely unusual for a liquid, and these in turn influence physical properties such as density, heat capacity and heat conduction, as well as the manner in which water receives within itself the molecules of solutes.

When water is supercooled to the experimental limit of -38°C, its heat capacity increases dramatically. At the theoretical limit of -45°C the heat capacity of water would be infinite; water could absorb infinite quantities of heat without increasing its temperature. At this theoretical limit even the slightest increase in pressure would make water disappear, similarly to what happens with black holes in which the reversal of the time arrow makes matter disappear.

The properties of hydrogen bonds and the unique syntropic properties of water suggest that water is constantly under the effect of retrocausal forces. This would explain why it is so difficult to predict the behavior of water molecules even in a small glass.

Based on these consideration, in February 2011 we wrote a commentary for JOC (Journal of Cosmology) on a scientific article by Dr. Richard Hoover (Hoover, 2011) of the NASA Marshall Space Flight Center. Dr. Hoover discovered evidence of microfossils, similar to cyanobacteria, in freshly fractured slices of the interior surfaces of carbonaceous meteorites and, based on Field Emission Scanning Electron Microscopy and other measures, concluded they are indigenous to these meteors, i.e. comets. The law of syntropy states that life is a general law of the universe that requires the presence of water. A feature of comets is that of being rich in ice which, close to the sun, melts and becomes water; therefore in our commentary (Vannini, 2011) we suggested that,

according to the law of syntropy, living organisms can form in extreme conditions, such as those that characterize comets, and that Dr. Hoover's discovery of microfossils in meteorites seems to confirm this law.

Supercausality

Entropy and causality are divergent, whereas syntropy and retrocausality are convergent. Conventional science considers only causality with effects which diverge towards the future. Retrocausality has its causes in the future, whereas effects diverge backward in time. Consequently, for us moving from the past to the future, causality produces effects that diverge from the past, whereas retrocausality produces effects that converge towards the future, and which become nil when they reach the attractor.

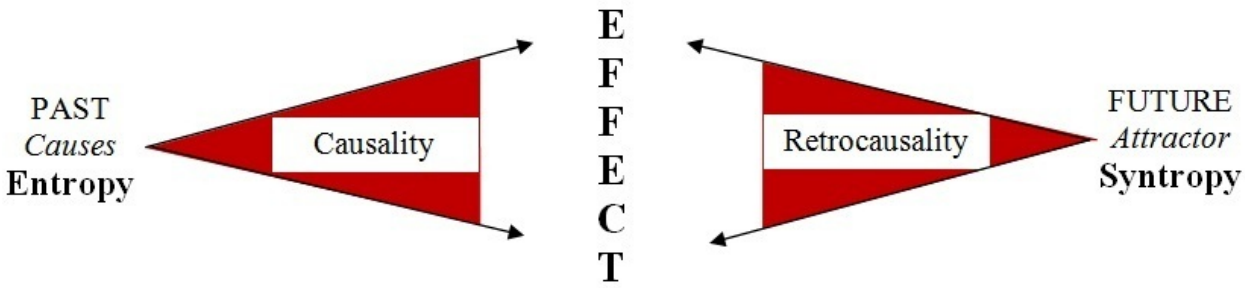

Figure 6 – Supercausality: effects are the result of the interaction between causality which is divergent and is governed by the law of entropy and retrocausality which is convergent and is governed by the law of syntropy.

In 1963 the meteorologist Edward Lorenz discovered the existence of chaotic systems which react, in each point in their evolution, to small variations. Studying, for example, a simple mathematical model of meteorological phenomena, Lorenz found that a small perturbation could generate a chaotic state which would amplify, making weather forecasting impossible. Analyzing these unforeseeable events, Lorenz found the existence of attractors, a factor which was named the "chaotic attractor of Lorenz" which causes microscopic perturbations to be amplified, and interfere with the macroscopic behavior of the system. Lorenz described this situation with the words: "*The flap of a butterfly's wings in Brazil can set off a tornado in Texas*".

When attractors interact with physical entropic systems, fractal geometry arises. A fractal is a geometric object that is repeated in its structure the same way on different scales, that has an aspect which does not change even if it is seen with a magnifying glass. This feature is often called self similarity. The term fractal was coined by Benoît Mandelbrot in 1975, and derives from the Latin word *fractus* (broken), similarly to the word fraction, since fractal images are mathematical objects of fractional dimension. Fractals are often found in complex dynamical systems and are described using simple recursive equations. For example, if we repeat the square root of a number greater than zero (but smaller than one) the result will tend to one (but it will never reach it). Number one is therefore the attractor of the square root. Similarly, if we continue to square a number greater than one, the result will tend to infinity and if we continue to square a number smaller than zero, the result will tend to zero. As shown by Mandelbrot, fractal figures are obtained when inserting in an entropic system an attractors (which tends to a limit). These complex shapes, and at the same time ordered, are obtained when an attractor is inserted in an equation.

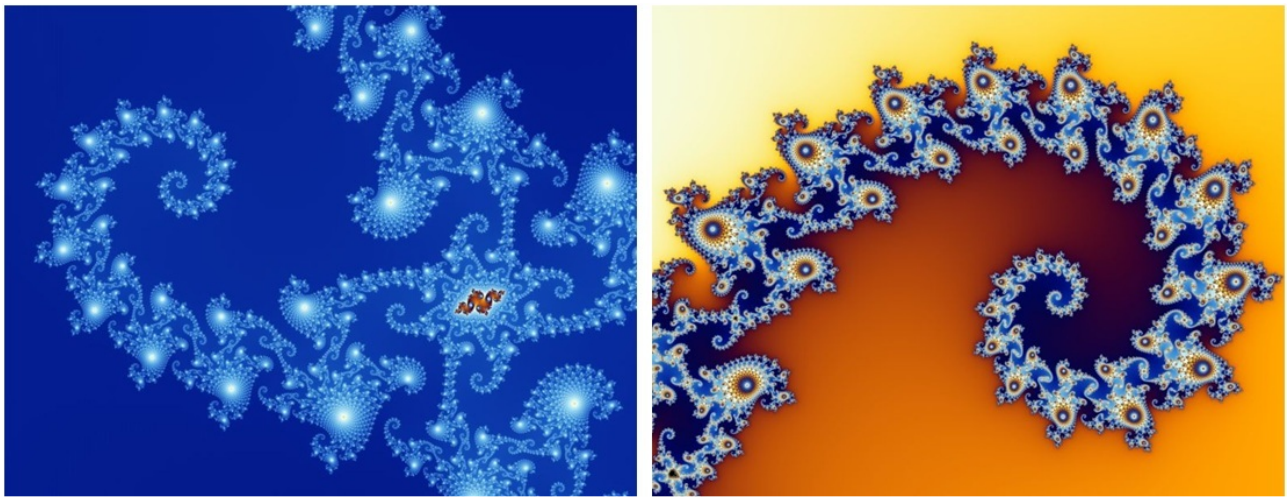

Figure 7 – Example of fractal images (source Wikipedia).

Fractal geometry reproduces some of the most important structures of living systems, and many researchers are arriving at the conclusion that life processes follow fractal geometry: the outline of a leaf, the growth of corals, the form of the brain and the nervous terminations. An incredible number of fractal structures has been discovered, for example blood arteries and coronary veins show ramifications which are fractals. Veins divide into smaller veins which divide into smaller ones. It seems that these fractal structures have an important role in the contraction and conduction of electrical stimuli: the spectral analysis of the heart frequency shows that the normal frequency resembles a chaotic structure. Neurons show fractal structures: if neurons are examined at low magnification, ramifications can be observed from which other ramifications depart, and so on. Lungs follow fractal designs which can easily be replicated with a computer. They form a tree with multiple ramifications, and with configurations which are similar at both low and high magnification. These observations have lead to the hypothesis that the organization and evolution of living systems (tissues, nervous system, etc.) is guided by attractors (causes placed in the future) in a similar way to what happens in fractal geometry.

The biologist Rupert Sheldrake, starting from the "*theory of catastrophes*" developed by the mathematician René Thom (Thom, 1980), suggested that morphogenesis, the process which shapes living organisms, is guided by attractors (Sheldrake, 1981). Thom introduced the hypothesis that the shape could be due to causes that act from the future and Sheldrake added the concept of formative causation, according to which morphogenesis is driven by attractors, final causes. The term "morphic" comes from the Greek morphe which means shape and which is used to emphasize the structural aspect.

A similar description of life was reached by the Jesuit and paleontologist Pierre Teilhard de Chardin (1881-1955) who argued that while astronomy detects an initial event from which the physical world originated (the Big Bang), paleontology identifies an end point towards which life is converging. Teilhard calls this end point the Omega Point and states that a correct reading of sacred texts shows that the origin of life is in the future and not in the past. Teilhard's claims have sparked debate within the Catholic church and a decree of the Holy Office chaired by Cardinal Ottaviani, in 1958, imposed religious congregations to withdraw the works of Teilhard from all their libraries. The decree states that the texts of the Jesuit "*offends Catholic doctrine*" and alerted the clergy to "*defend the spirits, especially of the young, from the dangers of the works of father Teilhard de Chardin and his disciples.*" However, Cardinal Ratzinger, now Pope Benedict XVI, in Principles of Catholic Theology (1987) admitted that one of the

main documents of the Vatican, *Gaudium et Spes*, was strongly influenced by the thought of this Jesuit. Benedict XVI also said that Teilhard had a "great vision" that "at the end will lead towards a true cosmic liturgy."

Teilhard's thought is similar to that found in many Eastern doctrines and even in the Islamic religion. For example, in the Koran, verbs are always used in the past tense, because God speaks to humanity from the future. Islamic doctrine describes a humanity which progressively evolves towards Allah who attracts life from the future, in a similar way to what the law of syntropy describes: life evolves towards attractors which are located in the future and which converge into a final attractor of love.

According to the law of syntropy the aim of life is to bring out the design and project which is already present in the attractor. Similarly to what Michelangelo used to say:

> "*In every block of marble I see a statue as plain as though it stood before me, shaped and perfect in attitude and action. I have only to hew away the rough walls that imprison the lovely apparition to reveal it to the other eyes as mine see it.*"

According to the law of syntropy, living species originate from the influence of attractors through the retrocausal properties of water and the chances of survival are linked to the ability of individuals to bring out the shape and the design which is already present in the attractor. The first living organisms originate in water and have primitive and essential structures and forms which evolve gradually towards the attractor that is providing them with syntropy, shape and in-formation. Every living species would have its own attractor and, therefore, the process of evolution does not imply the transition from one species to another (from less evolved species to higher species), but species evolve in parallel, towards their attractor with equal dignity.

References

Di Corpo U (2005) and Vannini A, *Syntropy the Energy of life*, Kindle Editions, ASIN: B007MZWDSS.

Di Corpo U (2011) and Vannini A, *The Law of Syntropy*, Kindle Editions, ASIN: B006QHVZPA.

Di Corpo U (2011) and Vannini A, *The Vital Needs Theory*, Kindle Editions, ASIN: B006M0L0R4.

Di Corpo U (2011) and Vannini A, *Origin of life, evolution and consciousness in the light of the law of syntropy*, Kindle Editions, ASIN B005HADKWS.

Di Corpo U (2011) and Vannini A, *Supercausality and complexity: changing the rules in the study of causality*, Kindle Editions, ASIN: B005N5KLCE.

Fantappiè L (1944), *Principi di una teoria unitaria del mondo fisico e biologico*, Humanitas Nova, Roma 1944.

Lorenz E (1963), *Deterministic Nonperiodic Flow*, Journal of the Atmospheric Sciences, 1963, 20(2): 130-140.

Mandelbrot BB (1987), *Gli oggetti frattali*, Einaudi, Torino 1987.

Teilhard de Chardin P (2004), *Verso la convergenza. L'attivazione dell'energia nell'umanità*, Gabrielli Editori, Verona, 2004.

Teilhard de Chardin P (2008), *Il fenomeno umano*, Queriniana, Brescia, 2008.

Van Flander T (1998), *The Speed of Gravity What the Experiments Say*, Physics Letters A 250:1-11.

Van Flander T (1996), *Possible New Properties of Gravity*, Astrophysics and Space Science 244:249-261.

Van Flandern T and Vigier JP (1999), *The Speed of Gravity – Repeal of the Speed Limit*, Foundations of Physics 32:1031-1068.

Vannini A (2011) and Di Corpo U, *Extraterrestrial Life, Syntropy and Water*, Journal of Cosmology, http://journalofcosmology.com/Life101.html#18