TIMELESSNESS
IN TIME

A Journey through a Designed Cosmos

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INTRODUCTION

Being born as a human being on the planet Earth we face the wonder of the starry sphere looming over our head. The sun, the moon, the planets and the stars have evoked many thoughts and philosophical speculations throughout ages. In all civilizations man has imagined the realm of God to rest beyond the dome of the sky, where the stars wander as mysterious candle lights of Heaven.

How everything has come into being? Who has created the sun, the moon, the planets and the stars? Where does this starry sphere end? Is there anything beyond the realm of the stars? Why are we all here on Earth? Is there any God controlling the destiny of all living and non-living beings? These are some of the questions we often ask. The desire to get answers to these fundamental questions has led us to religious speculations.

Until science had started discovering the laws, which drove the stars, the planets, the sun and the moon in their paths, God had played the central role as the creator. Now we know that the sun is only an ordinary star wandering among billions and billions of such objects in the sky. All those point-like lights that decorate the night sky are nothing but stars. Some are more luminous than the sun. The planets are orbs moving around the sun under the pull of gravity generated by the star. Similarly, there exist planets around many other stars. The motions of these planets are destined by the laws of gravity. The cosmic objects repeat mechanically their motions without the help of God.

During the last three hundred years our understanding of the universe has progressed in a rapid pace, and changed the view of the cosmos dramatically. During the last century the science has revealed what lies outside the starry sky and how the stars and planets may have been created from gas clouds by following the laws of physics.

We live on the surface of a sphere made mostly of silicon, aluminum and iron chemically combined with oxygen. The biological life, consisting of millions of species, exists inside a thin skin covering this planet. It is known as biosphere. Compared to the size of the Earth, even the largest animals will appear as small as the bacteria living on an apple skin. The humans, who make only one of the millions of biological species on Earth, are about 6 billion in number. The cattle, goats and pigs are equally numerous. The birds could be thousands of time more in number than all the mammals. The insects are million and millions of times larger in number than all animals and birds. The bacteria in turn are many trillion times more numerous than the insects. The planet Earth orbiting around the sun, while carrying this awful number of biological species in a thin layer on its surface, is, in fact, nothing but a tiny solid marble of 1mm in size compared to the mother ball, the sun, of burning gas of 1m in dimension.

This burning gaseous ball is only one among the hundreds of billions of such stars which form an island universe called the Milky Way galaxy. The stars we observe in the night sky belong to this island which is a whirlpool of stars and gases. The island is so vast that light moving in a speed of 300 000 km per second will take hundred thousand years to cross from one end to the other. The solar system, with all its planets exist as a small pebble scattered in the outskirt of this whirling island. What we once thought to be a starry sphere is, in fact, a flat disc shaped island of stars. The starry world ends beyond the boundaries of this disc. But the universe does not end here. As one moves beyond the distance where the spiral arms of the Milky Way galaxy have come to an end, there exist other island universes, similar to our own galaxy. They too contain billions to trillions of stars in their arms. The light may take a million or more years to reach from one island to the next. There are millions and millions of such galaxies in the universe. Light will take billions of years to cover the cosmic arena.

One may wonder where does this universe filled with galaxies end? Is there any end? Or does it continue in larger and larger scales beyond the sphere strewn with galaxies? Just try to imagine: Compared to a galaxy the entire Earth with its billions and billions of biological animals is much smaller than a bacteria living in an island several hundred kilometers in length. It seems absurd to think that so infinitesimally small creatures, like human beings, inhabiting the surface of the Earth, is pursuing to know the nature of this immense universe. They want to know who has created them? Who has created this universe?

The human beings have found out how the stars may have formed from burning of hydrogen gases after they collapsed under the force of gravity. The majority of the galaxies appear as disc shaped spiral whirlpools, known as spiral galaxies, like our own Milky Way. They also appear in several other shapes. The shapes vary from spirals with widely open arms, called barred spirals to rounder ones without any spiral arms wrapped around them. This last group of galaxies is known as elliptical galaxies.

The most interesting fact about them is that all galaxies are flying away from the place from where we humans are watching the universe. Some are moving faster than the others. The slow moving galaxies mostly appear in spiral shapes. The fastest moving galaxies, in turn, mostly belong to the elliptical group. There are also many small blue galaxies of irregular shapes that are generally found to be moving in a faster speed. Why it is so? Why all are moving away from us? Why so many different varieties of galaxies?

Spiral galaxies carry dense hydrogen gases in their arms. The stars form when these gases get compressed and start burning. Gravitational force holds the burning clumps in starry shapes. Wherever one finds dense clouds of gases, one observes the creation of new stars. The spiral galaxies, which possess large amount of gases in their arms, are therefore the main sites for creating young stars. The elliptical galaxies do not harbor young stars because there is not much gas left in those galaxies in the form of spiral arms. These galaxies mostly contain older stars, which have burnt most of their fuels and are in the process of dying. The small blue irregular galaxies on the other hand are sites of intense star formation. They are extremely hot. Why new stars are being born profusely in galaxies moving faster as well as in slow moving spirals? Why the fast moving elliptical mostly contain older stars? Is it possible to understand the mystery of creation of these galaxies from this information?

Although much remains to be understood, the thing which has become clear to the human beings is that we do not live in a tranquil universe. Everything in this universe is moving; everywhere stars are being born, evolving and getting old before dying and disappearing in space, just like all biological life on Earth. Not only the stars, the galaxies are being born, then evolving and getting older, before decaying into space.

What is causing the motions, the birth and death of everything in this restless universe? Is there any plan? Any God? Any creator who is controlling the dance of life and death in order to enact a purpose and a meaning? Or is it all moving under mechanical forces bound by strict laws in a blind path without any reason and purpose of existence?

Based on the assumption that the force of gravity has caused the formation of structures in the universe, theoretical models about the creation of the universe have been proposed. The model which enjoys overwhelming support among the scientists these days is known as the big-bang model. This model is based on the theory of gravity proposed by Albert Einstein in 1916.

Making the assumption that the matter in the universe is distributed in a homogeneous and isotropic manner, a solution of Einstein's equations of gravity was found about eighty years ago. This assumption means that wherever one may scoop material from the universe, the sample material would look very

similar everywhere. The solution indicated that the universe was concentrated inside a size of 10^{-33}cm i.e. billions of trillions of trillions times smaller than one centimeter (atom is only hundred millionth of 1 cm). All mass belonging to the billions of galaxies once existed inside this unimaginably small point, called the Planck-length. Time started when the universe emerged from this point. Before that moment there existed no physical law. The laws and the forces of nature came into being with the birth of the universe. In the beginning universe existed as energy carried by radiation emitted by an immensely hot ball of light. As this light-ball expanded and grew larger, the ball cooled. With this cooling particles, which later formed the composition of matter, appeared. More the universe expanded, more it cooled. After about a few hundred thousand years of its birth, the particles combined to form atoms and hydrogen gases.

According to the big-bang scenario the initial explosion created ripples, which grew with time and caused the hydrogen gas clouds to break apart into pieces. The stars formed first. Then galaxies, clusters of galaxies, super-cluster of clusters of galaxies have come into existence by clustering generated by the gravitational pull.

By using this model the scientists decide the distances of the galaxies: The faster the galaxies move they are believed to be more distant from us. The slow moving spiral galaxies constitute the nearby universe, while the elliptical galaxies lie at a very large distance from where light takes billions of years to reach the Earth-bound observers. It is argued that the fast moving objects tell the story of formation of galaxies in the early age of the universe. The blue irregular galaxies are believed to be primordial structures. Through merging of these structures larger galaxies may have taken shape. The formations of the elliptical galaxies are explained as results of collision and merging of spiral galaxies existing in the early time.

The idea to explain the formation of the inhomogeneous nature of the universe from an initially homogeneously expanding fireball through fragmentation, then collision and merging of galaxies, faces tremendous difficulties.

In this book I shall give an alternative view about the creation of structures in the universe. According to this new view the universe has not begun at a particular moment of time, and not expanding since an explosion has taken place at the beginning of time. Instead the universe is eternally existing without any beginning, or end in time.

The book deals with fundamentally different concepts than what had been accepted for the last eighty years since the big-bang model took its root as the dominant theory in explaining the mystery of creation.

The basic idea behind this alternative scenario of creation revolves around the view that there exists an eternally unchanging design which appears in the similar way in different scales. This design lies at the foundation of formation of cosmic structures ranging from the smallest to the largest cosmic objects we may observe. It is a fractal, which means that the design is made of smaller replicas of itself, which in turn are made of even smaller images of the same design, and so on... hierarchically embedded in smaller and smaller scales. What we may see in the formation of planets and stars, repeats in a larger scale of galaxies, which in turn reappears again in the formation of even larger structures and so on...finally encompassing the largest structure that we know as our universe.

In this universe matter flows outward and streams inward at the same time in all scales. Everywhere, in all structures, there is an expulsion of hotter matter from inside to outside, and falling of colder matter from outside to inside. In all structures this out-flowing and in-falling streams proceed in opposite directions, as if, the cosmic bodies try to refuel the burning process, occurring in the formation of the structures, by withdrawing matter towards the center, which are being expulsed, after they have cooled down during

their outward journey. The streams of outflow and the inflow knit a fractal pattern in every scale one may study the universe. In the highest scale the universe expels structures from the center, and set the super-super-cluster structures in a journey outwards in the limits of the space. At the same time structures move from the far distant regions towards the center, where larger structures are crushed into smaller units, and returned in the streams making an outward journey. Thus universe self-creates itself by reusing the material produced by death and decay of structures that once formed its content.

Everywhere, in all scales, the universe sends things in their journey from birth to death while dictating a universal path of evolution. Nowhere things ever remain unchanged. Even the fractal design itself, which lies at the root of creation of all structures, undergoes an evolutionary change. Instead of being a static one, it undergoes a dynamic transformation from being a loosely knitted design to a tightly knitted one. After reaching a critical stage of tightening, in the end the design tears apart giving birth to a new cycle of formation of the same design. In the galactic scale this evolution of the cosmic design, passing from loose to tight pattern, results in the creation of the elliptical galaxies from the young barred spirals and spiral ones.

One may imagine the universe to be an ornament studded with jewels where the individual gems vary in intensities. Every jewel becomes intensely burning at birth and then gradually turns dimmer with age. While some jewels become brighter, the others turn weaker. The life of one becomes the death of the other and vice versa. All the gems are woven together as a whole. In this ornament, as the jewels pulsate, it creates a fluctuating world. However, though things fluctuate everywhere, the entire pattern holding the ornament together as a whole does not change. Thus, while a timeless design holds all occurrences in place, the fluctuating world brings the consciousness of time in the mind of the observer.

In this book I shall try to describe this scenario of the creation of the universe where time exists in a background pattern which is timeless. I shall endeavor to explain the concept of the hidden order behind the fluctuating world apparently entangled in a chaos. The design, which acts behind the creation of the universe, bears a profound order embedded in scales after scales...penetrating smaller and smaller dimensions. The way the universe has ordered everything to act in unison as an inseparable whole, where the largest structure images itself in its smallest parts, overwhelms all human imagination. The dynamics, by which everything remains critically balanced between order and chaos, will make one wonder what should one call it, if not the work of God!

By writing this book I intend to share my excitement of coming across a universe, which has profoundly altered my understanding of the meaning of existence, and evoked feelings of encountering a supreme intelligence hiding behind the natural order of things. The design, the impeccable order, the extreme tuning occurring in scales differing by billions and trillions of times, and the central role played by a spiral triskele i.e. a three-armed spiral in the creation process speak of a profoundly designed unfathomable universe. It is so unbelievable and unthinkable, but still so beautifully manifest as the world to be observed by conscious mind! It evokes religious feelings. God can be described as one with the universe.

The book will make the reader acquainted with a universe, finely tuned between equilibrium and non-equilibrium swinging between order and chaos, where no accident can exist without being absorbed in a purposeful scheme of creation. Nothing is inseparable; no accident can ever derail the course of its path of fulfilling the eternal design that upholds the existence of all as ONE.

The ideas, which I shall lay out in this book, have empirical foundation. They are not products of contemplative thoughts, or concoction of an imaginative mind. The ideas have emerged while studying empirical data in different wavelengths taken by NASA, ESA and other observatories of the world

ranging from super-clusters of galaxies to comets and meteors.

Though several questions are not answered, for example, how structures “freeze” into equilibrium state as solid bodies seen in the planetary spheres, the content of the book will take the readers in a journey through a universe which is radically different from the big-bang cosmology. On the way it will explain, what may have gone wrong with the big-bang model? One will be able to appreciate how such a model has embraced erroneous view by clinging to theoretical ideas: For example, the fast moving objects, like quasars, are not associated with very distant objects in the universe, or the activities taking place at the centers of galaxies are not powered by super-massive black-holes. Quasars are objects ejected from larger slow moving galaxies as they evolve towards elliptical shape, and instead of a black-hole a spiral triskele controls the dynamics of ejections and accretions at the centers of galaxies. I have also given alternative explanations of the observations of the recession of galaxies and the existence of the cosmic microwave background radiation, which constitute the main pillars in supporting the big-bang model.

I am aware that such a radical departure from the accepted cosmological view may make this book very provocating to those scientists whose activities are pivoted on the ideas of the big-bang. However, if human knowledge should make a progress, one needs to study this book before rejecting the ideas of the designed universe. One should remember that humanity has made such mistakes before, and by repeating it once again one may only retard the progress of civilization which hinges on the understanding of the greatest mystery that has puzzled mankind through ages.

Dhaka, 19. 12. 2010

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UNIVERSE BEYOND THE STARRY SPHERE

History

Though the starry sky disappears from our view when the sun rises in the sky all those stars are still there above our head when the sun shines. The rays blind our eyes and we cannot see the weak spots of light. They become visible only in the darkness. Therefore a moonless clear night is the best time to watch the beauty of the starry sky with naked eyes.

The stars do not remain in one place all the time. They move like jewels fixed on a celestial dome. The dome moves as a whole around us, and with it the stars move. Inside this dome, planets like Jupiter, Saturn, Venus, Mars, and Mercury etc. cross paths moving through different constellations of stars. Since the dawn of human civilization the sun, the moon, the planets and the rotating starry dome have constituted the realm of Heaven lying above Earth.

There have been many speculations about who may have created this Heaven and Earth. Two ideas have received preponderance: splitting and dismemberment. The idea like the splitting of an egg is quite common in different cultures. One needed the ideas of the existence of the gods to split heaven and earth into two different realms and then keep those realms in their respective places. In some cultures creation was seen as caused by the dismemberment of a cosmic dragon (Babylonian mythology), or giant (Nørren mythology) or cosmic man (Hindu mythology). In the dismemberment story one also needed the ideas of the existence of the gods who killed the dragon or the giant in order to create everything. Only in Hindu mythology the world was created by the self-willed sacrifice of the cosmic man.

More sophisticated ideas of the creation were developed by the Greeks. Pythagoras and Plato took to the ideas of the geometry and the existence of the transcendental world existing as ideas. The world was fashioned following the principles of harmony manifest in the geometrical relations of the Platonic solids. In Platonic cosmogony one still needed a creator, called Demiurge, who fashioned the world following the ideas existing in his "mind". The ideas were pure and eternal. Once Demiurge brought forth his creation the world was a representation of this transcendental world appearing in material forms.

It was followed by a more descriptive explanation of the universe by Aristotle. In this Aristotelian universe the Earth was at the center. The stars in the sky were eternal and unchanging. The sun, the moon, the planets and the stars were attached to rigid crystalline spheres which revolved around Earth in different speeds. The outermost sphere was the sphere of the first cause. Its motion imparted movements to the other concentric spheres lying inside it, and thus drove the planets, the sun and the moon in their paths. The Aristotelian model was revised by Ptolemy to fit the motions of the planets more accurately by introducing the idea of cyclic motions attached to fixed spheres. The motions of the cosmic bodies were described by circles which represented the perfection of a Divine Heaven.

The sphere of the "first cause" became the realm of God and this model was adopted by the Christian Church as a scientific foundation of their theology. Dante in his "Divine Comedy" described the pilgrim`s path to Heaven through these spheres before reaching the realm of Christ and God.

The Ptolemaic view of the geocentric world lasted until it was replaced by the Copernican view that the planets including our Earth were going around the sun. Kepler went back to idea of the transcendental geometry and tried to explain the orbits of the planets by using the relationships among the Platonic spheres. Soon modern cosmology took its birth. Newton proposed a mathematical model which could explain the motions of the planets. According to this model the cosmic bodies were moving following the laws of gravity. The gravitational forces, imparted on the planets by the sun, were causing these bodies to go around in the observed paths. The idea of the gravitational interactions among bodies causing the

celestial motions turned the universe from being the realm of God to the realm of scientific enquiry.

Milky Way galaxy and beyond

By then Galileo`s observations through telescopes had paved the path of discovery of a universe far outside the spheres of the sun, the moon, and the planets. Galileo had discovered many stars in the diffused path seen in the sky, which was known as the Milky Way. With the increasing power of the telescope by the end of 18th century it already became clear that the dome of the fixed stars was not a sphere. The stars were distributed in a flat structure. However, until the beginning of the 20th century it was not known that the sun was, in fact, lying at the outskirt of this disk made of billions and billions of stars like our sun. Thus the ideas of the crystal spheres and the divine harmony of the Platonic solids had to be abandoned. The island universe that made the Milky Way galaxy, had a spiraling disk structure, made of gas, dust and stars, and was not spherical and perfect as the Platonists and Neo-Platonists, and the Christian Church had assumed.

The stars were not eternal and unchanging. They too were ephemeral. They formed from gas clouds, evolved through different ages and decayed like the objects in the ephemeral world made of fire, water, air and earth. The objects on Earth and Heaven had very little difference in that sense.

With increasing power of the telescope human enquiry into the details of Heaven continued. Already by the end of 18th century philosophical speculation started if there could exist more island universes outside our Milky Way. However, only in the beginning of the 20th century it was ascertained that some of the nebulous objects seen through the telescopes were, in fact, island universes, like the Milky Way. They existed far beyond the realm of the stars, which constituted our island where the sun belonged. These island universes are now known as galaxies. There are billions and billions of these galaxies in the sky.

Island universe of many shapes and colors

The galaxies are observed in different shapes and colors. Majority of them are spiral shaped disk galaxies like our own Milky Way galaxy. These spiral galaxies possess impressive looking gaseous arms, where stars form. Among the larger galaxies the next abundant group is the elliptical galaxies, which may vary from ellipsoidal to spherical shapes. They possess little or no gaseous arms. Between the spirals and the ellipticals there exist a variety of shapes with decreasing arms and increasing size of the central core. This indicates an evolution of galaxies from spiral to elliptical form.

The spiral galaxies contain blue younger stars, and burgeon with newly formed stars in the galactic arms. The ellipticals are made of mostly older stars. There is very little, or no star formation in the ellipticals because the gases, from which the stars are formed, are already used up in the process of the evolution of a spiral into an elliptical. The presence of newborn hot stars gives the spiral galaxies a bluish color. As the stars burn, gases deplete and the burning process becomes less intense. The stars, after passing through their young age, become old and red in color.

Apart from the large galaxies there is a group of smaller dwarf galaxies possessing a very large rate of star formation. Large number of them are blue in colors and possess irregular shapes. They are often interpreted as the precursors of the larger galaxies.

These galaxies all seem to be moving away from the Earth-bound observer in different directions in different speeds. The large blue spiral galaxies are generally found to be moving slower than the red elliptical ones. Many star-looking spherical galaxies are observed to be moving very fast. Many dwarf blue galaxies are similarly found to move faster.

Clustering

Apart from the recession of the galaxies, these island universes cluster to form clusters of galaxies. Often one finds a massive elliptical galaxy in the center of such a galaxy cluster. Not only the galaxies cluster together, the clusters of galaxies in turn cluster to form cluster of galaxy clusters called super-clusters. Similar to the clustering at larger scales, the stars too form star clusters at much smaller scale. Even the objects of planetary sizes like the brown dwarfs form their own clusters too. While the clustering size of the brown dwarfs can be of tens of light years, the star clusters of hundreds, or thousands of light years are quite common in galaxies. The galaxies, which are normally of the sizes of hundreds of thousands of light years form clusters of the sizes ranging from tens to hundreds of millions of light years. The super-clusters are cosmic objects spanning up to billions of light years. This hierarchically ascending nature of clustering is the most fundamental nature behind the formation of structures in the cosmos.

Thus, instead of the universe being homogeneous and smooth, it is clumpy in all scales. It is in stark contrast with the idea of spherical perfection of the world as thought by the ancient philosophers.

Universal destiny of life and death

In complete opposition to the idea of the never changing stars, which once built the backbone of the understanding of the cosmos animited by the hands of a creator, the stars take birth, evolve and die. Like the stars, the galaxies, the clusters of galaxies, the superclusters... everything in the universe undergoes changes and evolutions similar to things which we observe in the earthly environment. The process of birth, evolution and death follows in all scales, however large or small the cosmic object may be. They take birth, evolve and die in similar ways – as if a universal destiny operates in all in the same manner. The galaxies take birth as a turbulent irregular shape, then grow to take spiral forms possessing a central core which is not yet evolved. Then with this process the outspread spiral arms wrap around the core more and more tightly, while increasing the size of the core. In a more evolved stage the arms nearly dispappear and the entire galaxy becomes one with the massive buldge at the centre, like in the example of the spherical galaxies. After that, the decay of the structure follows through disintegration into dwarf structures like globular clusters and ejections of jets. In some cases the galaxies may also explode. The same happens with the tiny stars. The stars seed in a turbulent cloud, form disk like spiral structures first, before turning into spherical shapes. The new born stars shine as hot blue objects. After the fuel depletes they grow old and turn as redgiants or redsupergiants. Some may explode; some may shredd off the outer shells and shrink as dwarf objects.

The star clusters, the galaxy clusters, the superclusters may also follow the similar destiny. Thus no object in the cosmos is eternal and never changing. All are caught in the tumoil churned by life, death and regeneration.

Why is this universe so ordained? Is there any creator who has set the rules according to which all must grow, evolve and die? If so, why the creator has chosen to do so? What purpose and meaning should these rules serve? Like Demiurge of Plato has he fashioned the world accroding to ideas, which transcend the nature of the physical world and exist as a separate “reality”of the Divine mind? Or, all what we observe in the universe are nothing but a manifestation of a meaningless chaos - a result of random accidents which have caused the world to appear from nothing in the form we see it manifest as our physical reality? Or, could there exist a design - a hidden order, through which the universe manifests without the prersence of an external creator – its first cause? In other words, it means: can universe exist without someone acting to bring it into being at a particular moment of time? Or is universe something like the Great Melody of the Celts, the Oran Mor, which never ceases, never ceased, or will ever stop? Can this melody be synonymous with creation itself, which never rose in the past and will never stop in the future? It continues eternally its song filling all of creations with a cosmic harmony. In the next chapters I shall try to answer these question. Go to list of contents

BIG-BANG AND AN ALTERNATIVE VIEW

At the time when scientists were still debating if there existed other island universes outside our own Milky Way, Einstein proposed a new theory of gravity known as the General Theory of Relativity. He explained gravity in terms of geometry. Before Einstein we were mostly used to three dimensional geomtery which included length, breadth and height that constituted the three dimensions of space every material body occupied. The distance between two end points in space determines the length of an object. Einstein came with the idea that this distance is not absolute. It is relative. The length depends on the observers` state of motion. If one is standing still and measuring the distance it will be different from the length measured by one who is in motion. Similar with measurement of time. If a group of people sitting in different parts of a room find time to be the same at every place, people in motion with respect to this group will find time to be different in different places. So time and space are connected with each other. He introduced a four dimensional world where time was the extra dimension.

Though Newton explained the planetary motions with his theory of gravitational force he could not explain how one body attracted another through empty space. What was being transmitted? What was happening in the intervening media separating the two bodies? He believed in some kind of Divine hands. Einstein came with a very sophisticated explanation of gravity. He said that every object possessing mass will curve the space-time around it like a stretched rubber sheet undergoing a dent around the region where a heavy object is placed on it. He equated the curvature of space-time with the mass-energy of the gravitaing body. It turned out to be very difficult mathematical equation to solve.

During the time when new island universes were being discovered a solution of this equation could be found if the universe was assumed to be homgeous and isotropic. The solution led to the birth of the modern cosmology known as the big-bang. The observations that the galaxies were all moving away from us brought the first reason to believe that big-bang model could be right. The idea of an explosion fitted well with the observation. Since then this model has dominated our understanding of the comos. On the way some problems rose. However, they were explained away by a newer version of the model called Inflationary theory.

According to this big-bang theory all matter and energy in the universe, from which all those billions and billions of galaxies have risen, were once concentrated at a point trillions of trillions of trillions times smaller than the size of an atom. The universe took its birth from this point. From then on time came into existence. Starting as an extremely hot ball of radiation the universe expanded while creating the particles from where all matter and antimatter were born. After a microsencond of its birth quarks clumped to form protons and neutrons. It took about 300 thousand years for the atoms to form and give birth to hydrogen clouds. From regions where the clouds became overly dense they collapsed under the gravitational force, and formed the conditions for the buring of gases. These burning clumps of gases became the sites of stars. According to this model, as the universe grew older and older the new born stars were pulled by gravity to form protogalaxies, which in turn merged together to form galaxies. It took many billions of years before the galaxies clustered together to form galaxy clusters. This scenario is known as the hierachical clustering model based on the merging of smaller structures into bigger and bigger scales. These days it is the most popular theory of the cosmic structure formation.

Before we enter into the discussion of the problems of such a theory, one may wonder who has ignited the fuse to create the big-bang in the first place? Was there any God who has caused this to happen? What was there before the explosion?

According to Professor Stephen Hawking, who has popularized the theory, there was no hand of God in causing the explosion. Everything had risen from nothing by following the laws of gravity by an accidental occurrence. Unless it had occurred we would not have existed to ponder about the question of universe. Since we exist it proves that it had occurred. There was no fundamental reason behind this event. It was just a blind chance that the universe had come into existence.

The universe has risen accidentally without any creator is the dominating view among the scientists these days. Such a universe is filled with mostly dark energy and dark matter. The dark energy constitutes 73% of the total energy of the universe, and the dark matter makes 23% of it. According to the speculation of Stephen Hawking black-holes could possibly constitute the content of the dark matter part. Thus 96% of the constituents of the universer remains dark and unknown. Only 0.4% is believed to illumine the heaven as visible as stars and galaxies.

One may wonder how the scientists have come to such conclusions? What has led them to believe in these numbers? In the first step, there is a consensus about the truthfulness of the theory of gravity as proposed by Einstein. As said before, this theory leads to an expanding universe. The big-bang model leads to the method of measuring distances of cosmic objects, like galaxies. Around 1930s Hubble proposed a law by which one could decide the distances of the galaxies. This law states that the distance of the cosmic object is proportional to the speed by which the galaxy is receeding from us. So faster the motion, more distant the object should be. The speeds of galaxies can be measured by measuring the shift of the spectral lines towards the red, known as redshift. Higher redshift means greater speed of the object. Later, in the end of the last century, a newer method of measuring distance has been proposed, which is not depnedent on the big-bang model. It is based on the measurements of energy reaching us from exploding stars. It is believed that a type of stellar explosion creates similar output wherever they may occur. Depending on the distances of these events taking place in other galaxies, and measuring the amonut of energy reaching the Earth-bound observer it should be possible to find out the distance of the place without depending on any model.

This new method of measuring distances of galaxies led to a new story. Until these measurements it was believed that the universe had undergone an exponential inflation immediately after the big bang and then slowed down and gradually expanding since then. Now with the new measurements the observations could not be explained unless the universe was accelearting once again. What could have caused this acceleration? Some force must be pushing the universe into this accelerating path. What could be this force? It is still unknown and termed as the dark energy.

But, why dark matter? What is dark matter?The idea of the dark matter comes from our way to understand the observed universe. It builds on the consensus that the theory of gravity is unfalliable. The planets around the sun are moving under gravity with utmost certainty. So must all cosmic objects follow this graviational law. However, the gases and stars moving around the center of the galaxies do not seem to follow this law. If they followed the pattern seen in the solar system, then the rotational velocities of the gases and stars further away from the center should fall off with the increasing distance. Instead they are found to increase and flatten out. Either the gravtional theory does not work, or something bizarre must be happening. If we do not want to give up our conviction about the sancity of the theory of gravity we must be able to explain this bizarre phenomenon. The idea of the dark matter came to rescue us from this scientific puzzle. If we believe that there exists a hallo of dark matter surrounding the galaxies, then

the gravitational pull of this dark matter may explain the observed phenomena. The motions of the galaxies in galaxy clusters, similarly need the idea of the existence of dark matter.

The nature of the dark matter is a matter of speculation. Some say it is ordinary matter, which has escaped detection. Some speculate that they could be matter of exotic nature. Some theorists think that they could be even tiny black-holes. In summary, the whole thing is wrapped in ignorance.

With this much of understanding scientists make models and do computer simulations to explain how the cosmic structures, like galaxies, clusters of galaxies, super-clusters of clusters etc have formed. If universe started as a homogeneous ball of light, how such a clumpy universe has risen from such a homogeneous "sphere"? What caused a univerrse, which was equally smooth everywhere, fall into chunks and generate a hierarchically clustered world?

To resolve this delimma it was proposed that when the universe came into being the big-bang had caused small ripples. These ripples grew bigger with the expanding fireball and caused the homogeneous clouds to break apart into chunks. From these chucks the stars formed, the stars pulled each other to form protogalaxies, protogalaxies coalesced under the force of gravity to form galaxies, the galaxies similary drew each other to form clusters of galaxies and so on.

Observations of the existence of the fluctuations of the microwave radiation, that comes from all corners of the universe, provided the proof of such an assertion. These fluctuations were interpreted as the signatures of the ripples created at the time of the big-bang. Before we go ahead to discuss the problems of structure formation with this model, let me explain a little more about these fluctuations first.

Apart from the observations of the galaxies flying from us, the measurement of the presence of microwave radiation, in which the universe seems to be immersed, gave the greatest impetus to the rise of the big-bang theory. In the early 1960s, by accident, a radiation was detected from all directions of the sky. This radiation was measured in microwaves. It was found to be a very cold radiation with a temperature of 2.73^{o} Kelvin. The big-bang theory gave an explanation of this radiation. According to the model, the radiation was the remnant of the fireball, that gave birth to the universe. After expanding for so many billions of years, the initially extremely hot ball of radiation has cooled down to the temperature we measure now.

Since then microwave background radiation has become the cornerstone in support of the big-bang theory. Once the temperature fluctuations were detected in the 1990s it gave the life to theories about how the cosmic structures may have risen as results of instabilites generated by the density fluctuations in the clouds. Since then many theoretical groups have made models and done computer simulations in order to explain the creation of structures while assuming different natures of the dark energy, dark matter and input of initial fluctuation spectrum among others.

However, the effort to explain the formation of cosmic structurers remains in a doldrum, without any substantial success. Many observational facts can not be explained. I shall only mention a few of them here.

First problem is to explain how those high redshift galaxies which are mostly ellipticals may have formed? According to the popular model the galaxies have formed around one billion years after the big-bang. They have taken shape by merging of smaller protogalaxies. In following this idea one faces many problems: Why all those high speed galaxies, which should be closer to the origin of the universe, are made of older stars and have stopped evolving, while the slower spiral galaxies, which appeared many billions of years, are younger? To understand it one needs to believe that there must exist two different

kinds of a glactic species: one which evolved very fast, immediately after their formation, and turned into old ellipticals, while the other did not evolve and remained in their early stage. Such a possibility sounds quite abtruse. Not only that, but also there exists large galaxy clusters at the time when galaxies should be just taking shape. It is like the mother being born before the child.

Several such unresoluble problems exist also in the present universe. First, comes the question of the voids. In the nearby universe, there exist large voids. According to the model large cluster structures should be more abundant than the void as of the universe expands. Another unexplained question: Why many large galaxies in the present universe are roaming alone? If they have formed from the merging of smaller structures, why are their immediate surroundings so empty of smaller structures? There seems to exist no trace of the environment in which they may have once formed.

In the next few chapters I shall explain the formation of the structures in the universe in a totally different way. In this view the universe exists eternally and the sturctures take birth, evolve and decay in a universal way by the mediation of a cosmic design. This design is a fractal knot i.e. a knot made of smaller similar knots, which in turn is made of even smaller knots and so on. The evolution of structures is driven by the tightening of the knots. The decay of the cosmic bodies follow the breakdown of the knots after reaching a critical stage. What decays and disappears “here” supplies the material for the regeneration of new structures “there”. The universe self-creates itself from what it destroys. It has no beginning or end in time. The so-called time exists in a timeless arena. The universe is an extremely complex entangled loop, that has no beginning and end. However, this complex universe, where the micro and macro worlds are inseparably entangled together to form one whole, is built in a simple way. It involves fractal clustering, knot dynamics and a spiral triskelion, which controls the outflow and inflow of material from the centers of the cosmic bodies. The universe unfolds and enfolds at the same time by dynamics controlled by the triple spirals sitting at the centers of structures.

Finally, new explanations behind the observation of the redshift of galaxies and the presence of the cosmic microwave background radiation will be given which do not involve the expanding universe model.

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AN ALTERNATIVE CREATION SCENARIO - COMPLEX DESIGNED UNIVERSE BUILT IN A SIMPLE WAY

Fractal clustering

As I have mentioned in the introduction, in the western tradition of thinking, since the time of Pythagoras and Plato there has been an emphasis on the geometrical relations and transcendental mathematical purity in creating models of the universe. Following the same spirit Einstein has formulated his theory of gravity and from there a homogeneous and isotropic universe has followed.

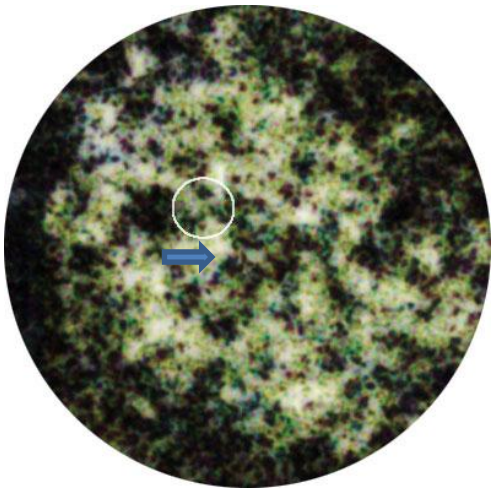
I shall talk about a universe which is neither homogeneous or "spherical". Instead, the universe bears the natural characteristics of the world that we observe around us everyday in water, air, fire and rocks, including the living world. There exist signs of imperfections everywhere things bear the imprints of an appartent chaos whereever we may look. Universe is no exception in that sense. What we see in the smallest structures around us bears the signatures of the world that is as vast as our universe. It images itself in the structures around us moving as clouds, leaping as burning fire, whilring as eddies of water and air, or as wonderful designs seen in mountains and snow, bearing cracks and faults which, in turn, also resemble the patterns observed in the living sphere.

Since early 1980s we have been drawn to study geometrical patterns which bear order amidst chaos. This has given birth to an active field known as chaos theory. Geologists first made use of this discipline, which later was applied in understanding patterns seen in the biological world down to the molecular level. In the middle of 1980s Mandelbrot popularized the subject known as Fractal Geometry, and speculated that universe itself could be a fractal.

In 1990s Sylos Labini (University of Geneva) and Petrorino (Univesity of Rome)began claiming that the universe was not homogeneous. Instead, it was fractally clumped. This led me to devleop the alternative view of the universe, which I am going to present here.

As this book is meant for the general public, I shall not go into details of the methods by which I have come to the conclusion that the universe is a fractal. I shall present the basic ideas and the results which may be appreciated by an intelligent reader, who is not any expert in the field.

Instead of being a homogeneous and spherically perfect universe, it is a chaotic system bound in order. It resembles a whirlpool and is more flat than round.



The superclusters of galaxies form a whirlpool looking structure of several billions of light years in size, centered around the largest supercluster named Coma supercluster. The arrow indicates the position of the Virgo supercluster to which the Local Group of galaxies belong. The Milky Way galaxy is a member of this Local Group. We find ourselves very close to the center of this whirlpool.

To study mathematically a wirlpool is one of the greatest challenges. To understand how a whirlpool may work has been an extremely diffficult problem beyond the capacity of most scientists and mathematicians. However, there has risen a consensus about how a whirlpool may be described in a more practical way. The successful description is built on the model of a fractal (multifractal). The fractality of a whirlpool has been experimentally verified.

Drawing of Leonardo da Vinci

One of the earliest ideas of the whirlpool, made of similar whirlpools of smaller sizes, can be found in a drawing made by Leonardo da Vinci. In modern time the most successful description of whirloopls is based on the ideas of whorls inside whorls inside whorls and so on...in descending scales...down to the microscopic level.

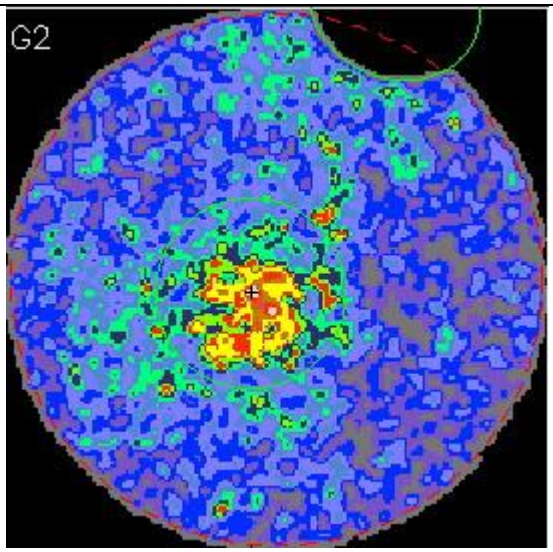
Such a system has geometric similarity with a cauliflower. By breaking a cauliflower into smaller flowers we discover the image of the large flower in the smaller parts. By breaking the smaller flowers into even smaller flowers do not change this pattern. One observes the similar structure again and again in smaller and smaller scales down to the microscopic size.

Cauliflower made of self-similar flowers

The universe is built in the similar way. The large structure images in a similar way in the smaller structures which cluster to form the whole. The smaller structures in turn are made of clusters of even smaller similar structures and so on....It continues in scales differing by billions of times and more.

The whirlpool, similar to the one seen in the scale of several billions of light years, is made of superclusters of galaxies of the sizes of hundreds of millions of light years, which in turn are made of clusters of tens of millions of light years. The image of the cluster of galaxy, known as Abel 3556, illustrates how the large structure, known as our nearby universe, is formed by the clustering of similar whirlpool structures. Such galaxy clusters are in turn formed by the clustering of galaxies. Many of these galaxies have spiral forms (in the chapter where I shall discuss the evolutions of the cosmic structures I shall discuss the question why some of the galaxies also appear to be elliptical. At this moment it is suffice to mention that ellpitical galaxies represent evolved stages of the spiral structures). These galaxes are about hundred thousand light years in size. Our own Milky Way galaxy is a spiral whirlpool. Similar clustering continues in the scale of thousands of light years, like the large star clusters, as well as in the scale of tens of light years, as in the example of the clustering of brown dwarfs in Pleiades. These brown dwarfs are objects of large planetary size, where gases have failed to ignite and turn into stars.

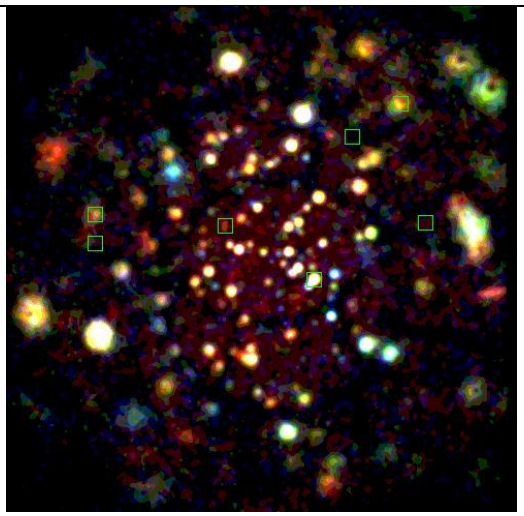
THUS SMALLER CLUSTERS FORM SIMILAR BIGGER CLUSTERS, WHICH IN TURN FORM EVEN BIGGER CLUSTERS, WHICH IN TURN BUILD EVEN EVEN BIGGER CLUSTERS AND SO ON...



Galaxy cluster Abel 3556

Galaxy

Star cluster



Cluster of brown dwarfs

Examples of fractal clustering of cosmic structures differing by billions of times in sizes

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Entangled knot

However, the universe is a more complex fractal than the example of the cauliflower. In the case of the "cosmic cauliflower" each cluster of flowers is a pattern formed by weaving of knots. In whatever scale one may choose to study – be it superclusters, clusters of galaxies, galaxies, star clusters and so on, a universal knot pattern remains hidden behind every structure. It is more correct to think of the structures in the universe as eddies. Each eddy is a complexly entangled fractal knot, which I shall explain later. Similar to eddies, which is made of smaller eddies, which in turn are made of even smaller eddies in descending scales, the cosmic knot is made of smaller knots, which in turn are made of even smaller knots and so on.

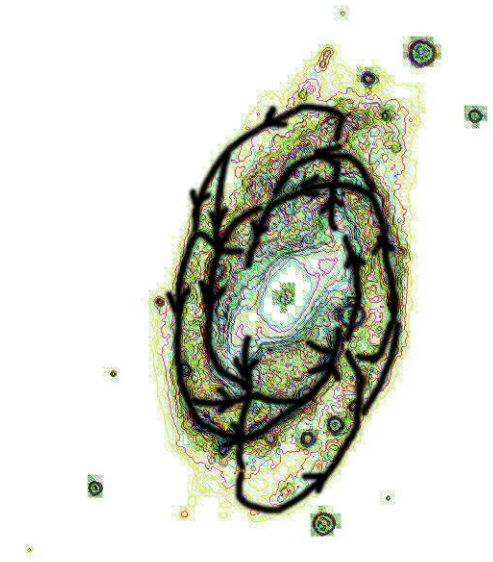
This knot forms the basis of the designed universe. The design is created by the embedment of self-similar knots in scales within scales going down to sizes differing by billions of times and more. This embeddment creates an unfathomable complex pattern, where the micro-structures are inseperably entangled with macro-structures existing in higher scales.

Though it may appear enormously complex, the universe uses a simple method to build the complexity. First, it involves two ways of arranging the fractal - in one way it uses the principle of the cauliflower. By this method it builds larger and larger clusters from smaller unit. In the other way it applies the construction mechanism of the "Russian Doll". Every knot which represents a cosmic structure is a kind of a "Russian Doll". At any scale it carries in its womb a daughter knot, which is similar to the mother knot. The daughter knot carries in its womb its own daughter, which carries its own daughter and so on.

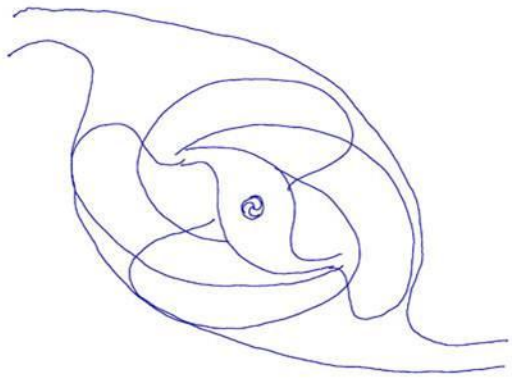
Though the simile of cauliflower and Russian doll may be relevant in describing the nature of the fractal involved in the designed universe, there exists a big difference. While the smaller flowers inside the bigger flower, or the daughter structure enwombed inside the mother are separable from each other, in the cosmic arena they are all intimately entangled with each other. Everything is woven in an inseperable way. In trying to tear and separate any structure from the unity, which binds all cosmic bodies as a whole, one needs to disturb the system globally. Likewise, a change in the global system will bring irreversible changes in the local arena. Local and global happenings are intimately tied together.

Let us now look at the spiral structure that forms the units of clustering in the galaxy cluster which I have illustrated earlier. Such spiral hides the cosmic knot inside it.

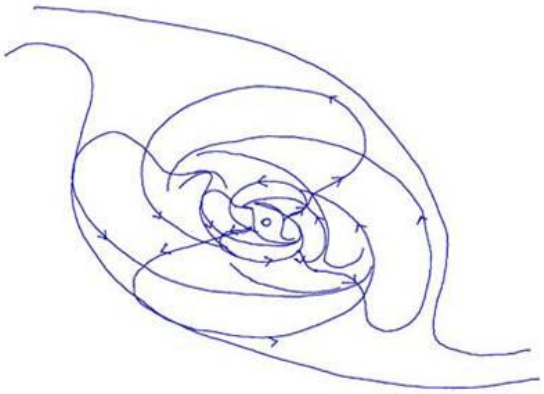
Galaxy M109



The knot hidden in M109



A simpler representation of the cosmic knot



Knot inside knot like Russian Doll

KNOT FORMS BY THE WEAVING OF THE HOTTER OUTGOING FLOWS FROM THE CENTER AND THE COLDER INCOMING FLOWS STREAMING TOWARDS THE CENTER. MOTHER CARRIES A DAUGHTER IN ITS WOMB, WHILE THE DAUGHTER CARRIES ITS OWN DAUGHTER, WHICH IN TURN CARRIES ITS DAUGHTER AND SO ON. INFLOWS AND OUTFLOWS FROM ALL MOTHER AND DAUGHTER STRUCTURES WEAVE THE COSMIC DESIGN WHICH IS THE FOUNDATION OF STRUCTURE FORMATION IN THE COSMOS. THE ENCOUNTER OF THE HOT AND COLD STREAMS FORM SEEDS OF SMALLER STRUCTURES, LIKE STAR CLUSTERS IN GALACTIC ARMS.

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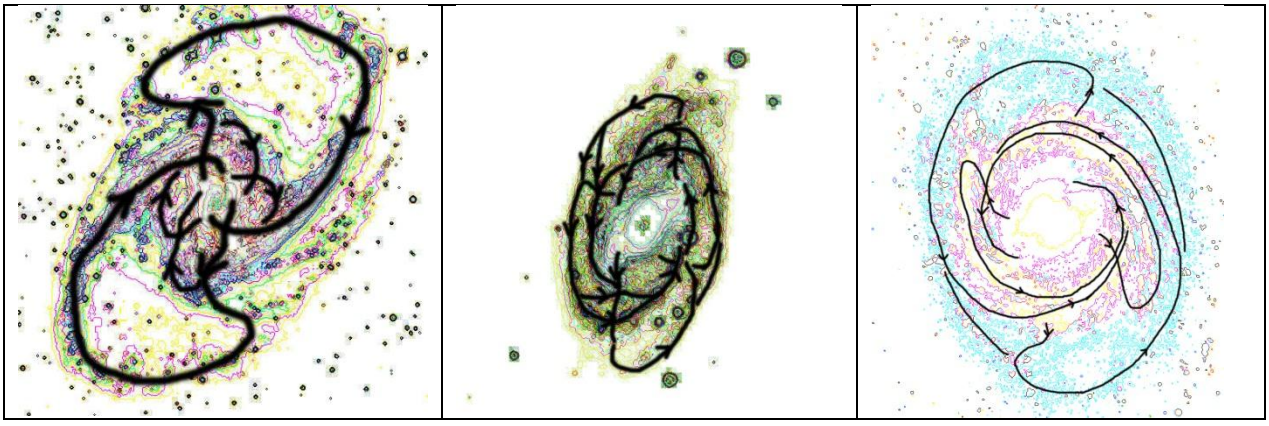
Tightening of the knot: Evolution of structures

The changes of shapes occur as the knot tightens. Knots form where the colder and hotter matter meet, and form a turbulent surrounding. Once the seed of turbulence is generated the knot develops. First it appears as a highly loose knot. After the formation with passing of time, it undergoes tightening. It causes the change of shape from barred spiral to spiral. With more thightening the structure evolves into elliptical and finally into a more rounder shape. This explains why ellipticals contain mostly old stars with very little sign of the spiral structure from whic they have evolved.



Example of the evolution of galaxies with progressive tightening of the knot

As the turbulence sets in to bring formation of new structure a transition from chaos to order sets in. In this situation the knot formation acts as the ordering mechanism in nature. The tighter the knot more orderly becomes the system. Therefore in the older system, there exists less chaos and more order. By reaching the elliptical stage it develops rings inside rings, which surround an evolved central core possessing an appearance of a spherical star.

This order increases as one approaches towards the centre. In a structure the outer parts remain more disorderly than the inner regions. Deeper the knot lies inside the cosmic body more tigther it becomes. The innermost knot inside the "Russian Doll" bears the most evolved stage, while the knots that encompasses it remain less tight and bear less aging. The outermost knot bears characteristics of younger age. Therefore calling the inner structure as daughter inside the womb of the mother may generate misconception. The "daughter" possess more order and signs of age than the "mother". In a galaxy, for example, the older stars are observed nearer the centre.

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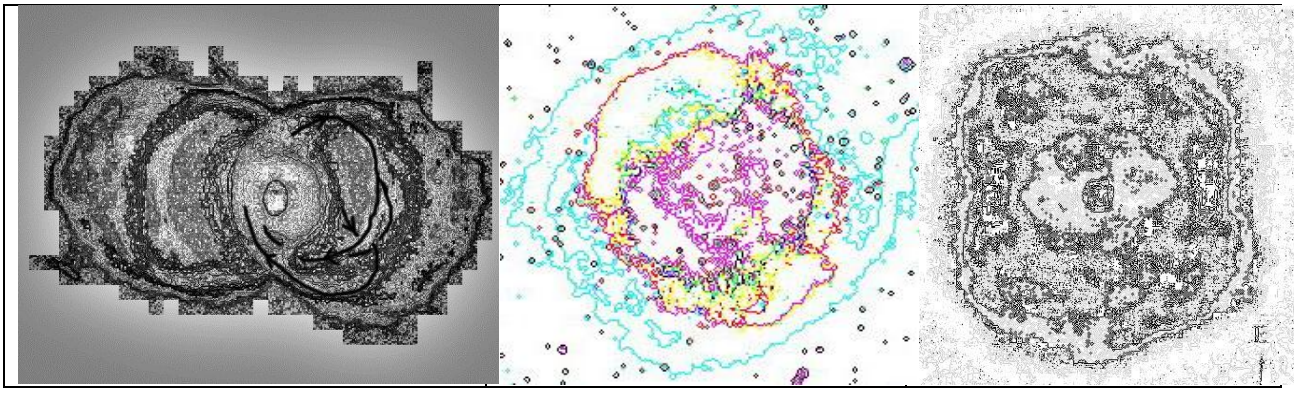
Universal way of forming structures

Stars, galaxies, clusters of galaxies etc. all undergo evolutions in a similar way. They begin as disk-shaped spiral objects, and then undergo evolution towards spherical forms. One may wonder how this transition may happen following the mechansim of the tightening of the knot.

I shall illustrate this process by giving examples of the stars and the galaxies. It is difficult to give illustration in the case of the galaxy clusters because to do so one would need more data in studying galaxy clusters in high-energy wavelengths, which are not available at this stage.

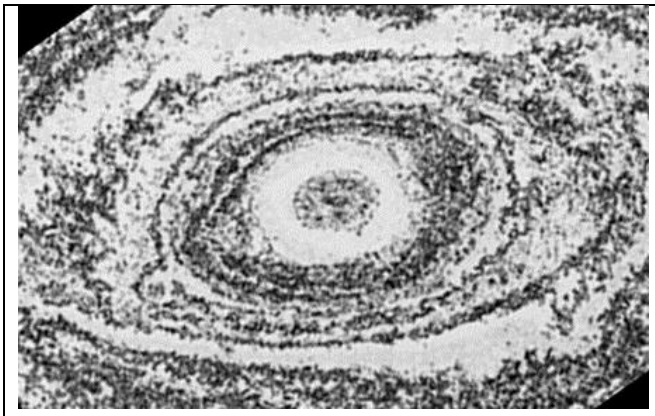
The basic characteristic of this process can be summarized as the following: As the spiral arms wrap around the core tightly, they form rings inside rings. I have illustrated before how these rings are interconnected and result from the weaving of the cosmic knot. The pressure from the central bulge pushes the outer rings away, which then expand and diffuse. This diffusion generates shell like envelops. Thus in the outer regions one may observe shells stacked inside shells in a hierarchical manner. When these shells separate from the central structure the star-looking objects are revealed.

Case of stars

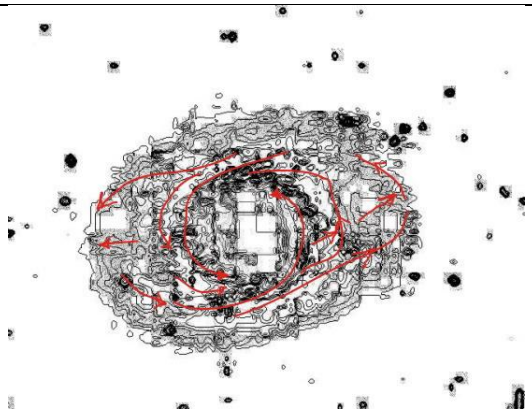


THE EXPANDING OUTER SHELLS STACKED UPON EACH OTHER REVEAL THE INNER STAR

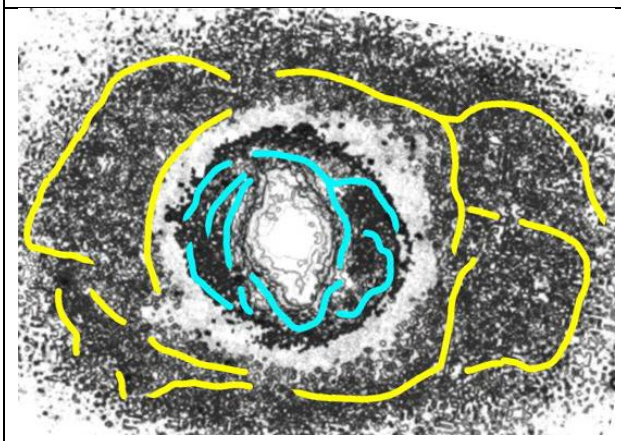
Case of galaxies



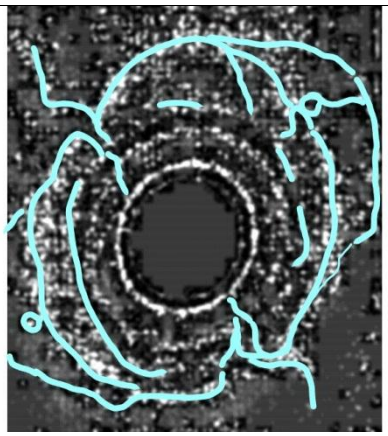
M81 galaxy



M95 galaxy



Hierarchically stacked shells in Ngc 3351



M87 Elliptical

THE OUTER SHELLS BREAK APART AND GRADUALLY DISPERSE REVEALING A MORE SPHERICAL STRUCTURE IN THE CENTRAL PART OF GALAXIES

The example of forming structure illustrated above show the universal mechanism by which these structure form though they differ by hundreds of thousands of times in sizes. This universality may continue to much higher scales in the realm of galaxy clusters and superclusters.

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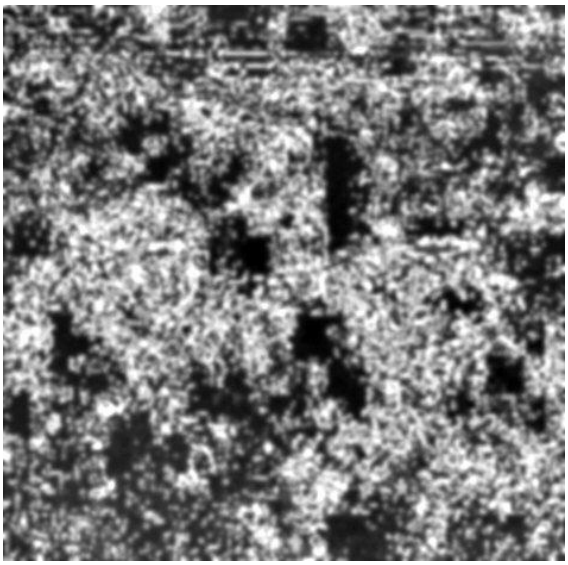
Triple spiral

Beside fractality and the knot the mechanism of forming structures involves a third universal element, which is a triple spiral sitting at the heart of the cosmic bodies**.** This triple spiral drives the dynamics of the expulsion of material from the center of the structure, as well as causes accretion of material towards the centre. Ejection and infall go hand in hand. The material moving outward and streaming inward generate the knot pattern. One can call it as unfolding and enfolding which occur simaltaneously in the universe.

Until now the scientist use the idea of the formation of cosmic bodies, like stars, as results of the collapse generated by the force of gravity. However, nothing collapses for ever in the universe. There exists a mechanism to halt a catastrophic collapse. The triple spiral acts as the source of the energy that hinders such a collapse and throws material outward instead. It is a source that sends out hotter material outward, which then cool and return towards the center again. Thus the triple spiral acts as both source and sink of the structure.

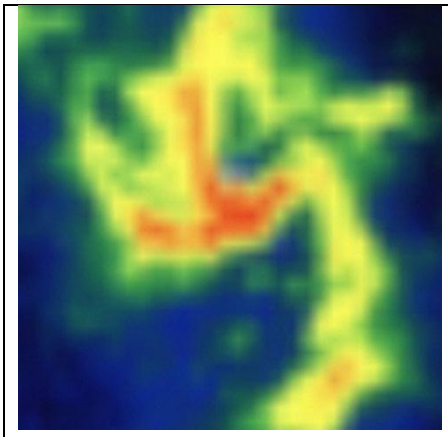


A triple spiral of the size of a billion light years acting as the source and sink of the universe we observe

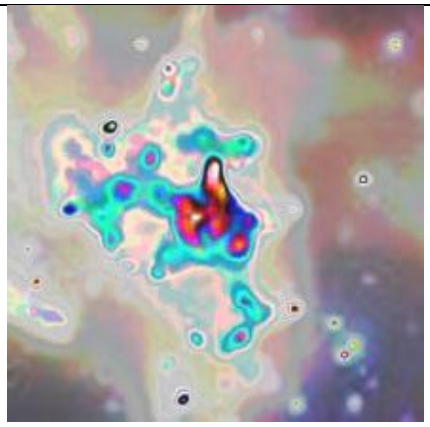
Universe itself creates the largest structure by the same mechanism. There exists a triple spiral at the center of the "void" known as the local void positioned in the constellation of Bootes. The so-called sheets moving as bizarre boundary walls in this void, which the scientists have so far been unable to understand, are nothing but the arms of a triple spiral of the size of nearly a billion of light years. It ejects supercluster structures from this center, which make journey outwards to form the structures in the universe. At the same time the universe feeds itself back with equally large structures on their ways to the source from where they had once risen. Thus the universe reorganizes itself constantly and generates new structures by engulfing the old. In this way it acts as the source and sink of itself. It destroys itself, in order to create itself and remain eternally existing in the same manner. Go to list of contents

Triple spiral inside triple spiral inside triple spiral and so on...

Not only in the largest scale of the cosmos, this triple spiral appears in all cosmic scales down to the sizes of the stars, and may be in even smaller structures. One of the most fascinating place to study this triple spiral is in the center of our Milky Way galaxy.



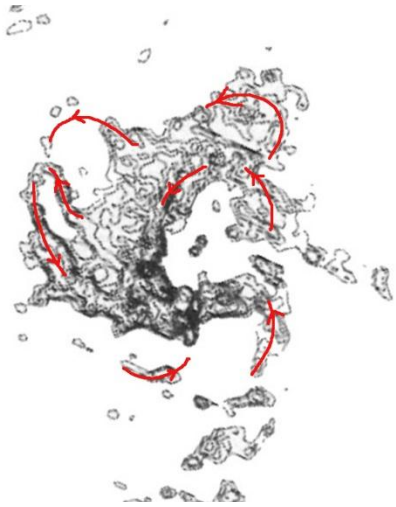
Triple spiral of the size of 10 light years in Milky Way center. It is ten thousand times smaller than the size of the galaxy



The central part of the triple spiral seen in X-rays

At the very heart of the Milky Way galaxy lies a triple spiral of about 4 light months in size

The triple spiral too bears the similar characteristic as the Russian Doll. There exists a smaller triple spiral at the heart of the larger triple spiral in turn. An even smaller triple spiral sits at the heart of this smaller triple spiral. The knot inside knot, which forms the spiral structure of the galaxy, emerges from this hierachically embedded triple spiral sitting at the deepest center. At each level of hierarchy, one sees outgoing and incoming motions. Incoming streams, arriving at the tips of the arms of the triple spiral, do not fully move towards the center. They split on the way. Part of the stream moves inward to feed a smaller triple spiral, while another part goes outward in forming a ring-like structure around the triple spiral lying deeper inside. In our galactic center a molecular ring can been seen around a triple spiral, which is about ten-light years in size. The streams, which move inward and penetrate this size, splits in the same way and generate ring around an even smaller triple spiral. These ejection and infall are intimately woven with the pattern of the knot existing outside the ring-inside-ring-inside-ring-like structures.



Infalling steams all do not reach the center. Parts are ejected outward.

This mechanism of splitting of streams, which takes away parts of the incoming flow from reaching further inward, prevents the situation when extreme density may develop at the center. In a situation of such extreme density one would have expected the formation of a black-hole. However, nature takes precaution against the formation of such an absurd object by developing mechanism of ejections on the way. In stead of a black-hole at the center of galaxy, one finds a micro-triple spiral.

Formation of star is accompanied in a similar way. Inside shell-like structures triple-spiral appears at the center. At the heart of this triple spiral one sees the star. The star itself hides a micro-spiral at its heart.

When a star explodes, like a supernova, one may be able to see the presence of this triple-spiral sitting at the center of the explosion.

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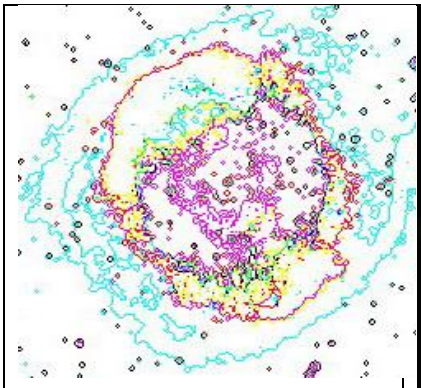
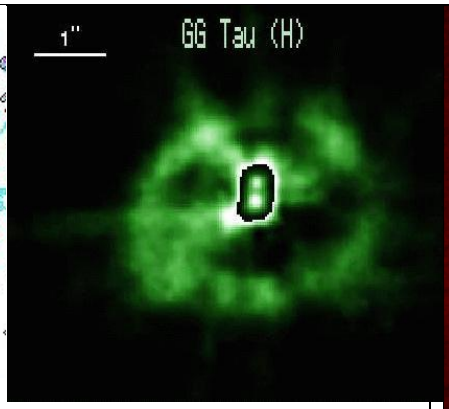
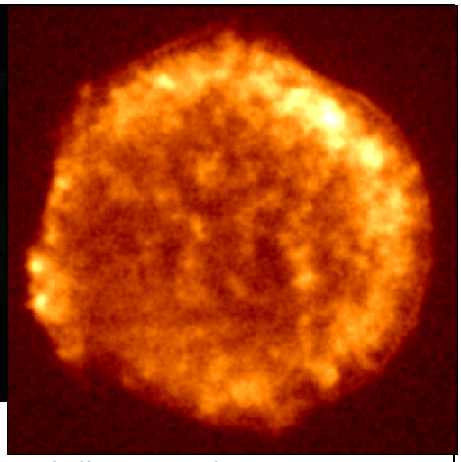


Star at the heart of a triple spiral surrounded by nebulous shells



Star forming at the center of a triple spiral surrounded by a ring



Exploding star:Tycho supernova

A cascading universe

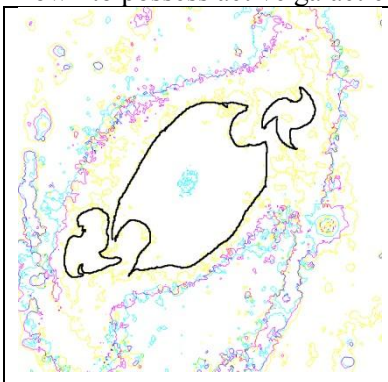
So the basic template, which the universe uses in building structures in all scales, seems to be quite simple: Start with a triple spiral, which ejects from the center, and draws material towards the center; build a fractal knot by weaving the incoming and the outgoing flows and thus entangle all in a complex network; then arrange structures in a hierarchical clustering as in a cauliflower.

Once Plato philosophised that Demiurge uses template to create everything in the world by using ideas. The creation of the universe which I propose, has similarity with such an ancient thought. The ideas behind such a template involve the following: fractal geometry, and knot dynamics driven by a triple spiral. However, in contradiction to transcendental Platonic spheres, the geometry involves extremely complex object that bears order amidst chaos.

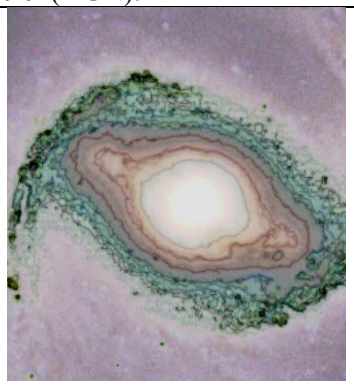
Though simple, this template, which the universe uses, is immensely profound. It holds everything in incomprehensible harmony and order amidst death, destruction and chaos. One may wonder how is it possible? How universe fine tunes everything in all scales, differing by billions and billions of times, in such a perfection? Without such incomprehensible fine-tunning nothing would ever exist.

In this universe, where every existence is dependent on the existence of everything else, the birth and evolution of a larger object carries with it the destiny that causes the smaller objects to take birth and evolve. The apperance of these smaller objects, in turn, carries the destiny of even smaller objects to appear and evolve in a similar manner as their mothers, who are in turn destined by their mothers. Thus, everything are destined by the birth and evolution occuring in the larger and larger scales. It goes on... The existence in the highest scale carries the first cause that destines all happenings in the universe. It seems to have similarity with Aristolian argunents, which built the foundation of the prooof of God in Christian theology. I shall come back later in this book to the question "is there any God who is the originator of this first cause?"

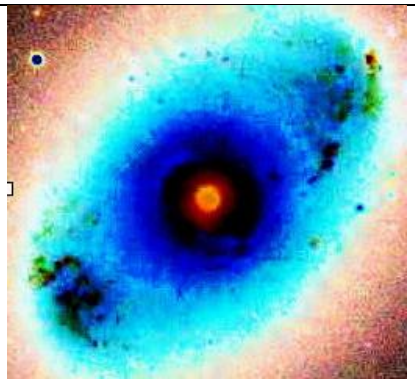
Before that, I shall discuss one of the two basic ways the larger structures destine the birth of smaller objects. The evolution of the larger structure brings forth the creation of the dwarf bodies. One method is the formation of structures in the inner realms. The bodies created in these central parts are ejected outwards. I shall illustrate this birth and ejection from the center in the case of those galaxies which are known to possess active galactic nuclei (AGN).



Birth of dwarf galaxies by breaking apart of two ends of a bar like structure at the center of a galaxy



Ejection of the dwarf galaxies from the central part of the galaxy from two opposite ends



At birth they take shape of triple spirals, before evolving into spiral and elliptical

The ejected dwarf structure, after breaking apart from the nuclear region, goes in wandering in its own path of evolution. As it evolves and matures, even smaller structures break apart from the center of the dwarf structure, creating even dwarf bodies. These dwarf-dwarf bodies, as they make their journey outside their mother bodies, eject even smaller objects. These cascade of smaller and smaller bodies being ejected from larger and larger units continue.

Therefore, there are many more ejected dwarf structures than what one may see as normal galaxy clusters, galaxies and stars, for example. Moreover, these ejected objects move faster than the mother bodies. So smaller and smaller ejections, appearing in this cascade, generate cosmic bodies moving faster and faster. Many of these fast moving ejected objects have been wrongly interpreted as quasars. As I have said, these quasras have been thought to be objects existing in the early time of formation of the universe. This error results from the calculation of the distance of cosmic objects by measuring their speeds, modeled by the big-bang theory.

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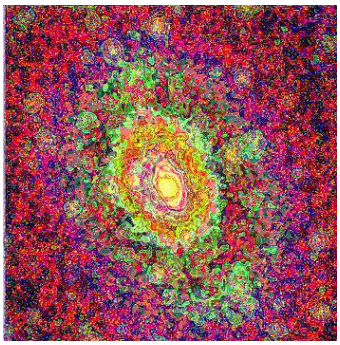
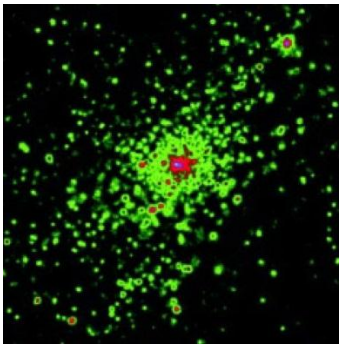
Why things come into existence in the first place?

Everything happens as consequences of what are happening in the mother structure to which the smaller objects belong. There exists nothing in the universe which is not embedded inside a larger unit. The larger units are in turn embedded inside even larger units and so on. Thus everyhing is tied together in a whole. Structure takes birth, evolve and die following the desitny of the mother undergoing tightening of the knot. The changes in the network, forming the mother, brings consequences to the worlds remaining inside it by setting them in their paths of evolution. They in their turns set the even smaller worlds in their paths of evolution. So, no creation in the universe has a personal choice, which is independent of the wholesome plan of the cosmos. They all must obey the cosmic order i.e. the template which acts as the foundation of all existence. Every change in the universe must fit into the cosmic design.



Galaxy cluster

A GALAXY EVOLVES BECAUSE THE CLUSTER TO WHCIH IT BELONGS IS UNDERGOING EVOLUTION



Star cluster

A STAR EVOLVES BECAUSE THE STAR CLUSTER TO WHICH IT BELONGS IS UNDERGING EVOLUTION

Thus all come into existence by following a universal design and plan destined by the immediately larger structure to which every object belongs. So everything in the universe follows its destined course as parts of the wholesome plan as the platonists and Neo-platonists had once believed.

Filamentary network in the Whirlpool galaxy

THE STAR CLUSTERS IN THE GALAXY FORM WHERE INCOMING AND OUTGOING FLOWS WEAVING A NETWORK OF VEINS MEET AT POINTS CREATING TURBULENT ENVIRONMENTS. THIS NETWORK OF TURBULENCE IS DECIDED BY THE EVOLUTIONARY STAGE OF THE GALAXY. AS A MOTHER STRUCTURE THE GALAXY DESTINE THE CAUSE OF THE STAR BIRTHS ALONG THE SPIRAL ARMS.

The creations along spiral arms is the other method of giving birth to smaller structures inside a larger cosmic body. In the first case I have talked about, the structures break apart from the mother body and go in their wandering outside the mother structure. In the second case, the smaller structures remain in the mother body as parts of a bigger cluster.

THE MOVEMENT STIRING THE UNIVERSE IN ITS LARGEST SCALE DECIDES THE DESTINY OF ALL. IT IS THE ROOT CAUSE OF ALL HAPPENINGS IN ALL SCALES.

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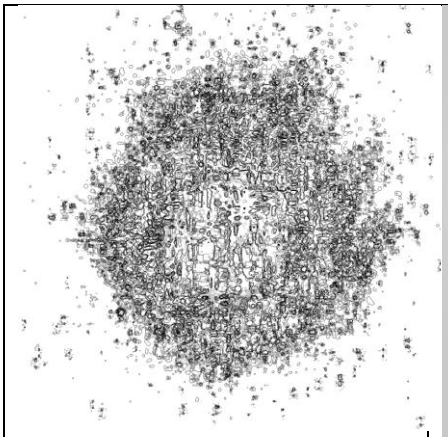
Death and decay are necessities for bringing birth and growth

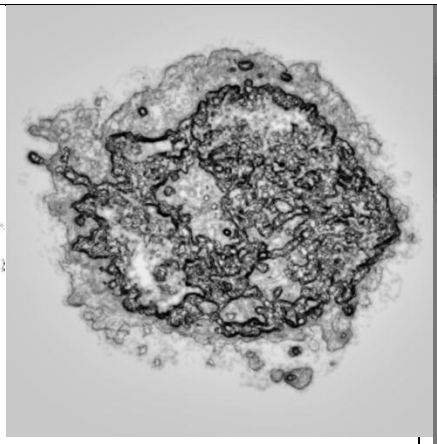
Nothing persists forever in the universe. Everything must come to an end after undergoing a period of evolution. This happens because of the universal mechanism of tightening of the knot, which animates every corner of the universe. After the structures arrive at the old age they face decay. The tightening can not go on beyond a crtitical point. After a limit is reached the orderly system breaks down. The knot starts tearing apart. The matter gradually disperses as decaying products, bringing chaos into play. Thus a transition to chaos occurs before new knots form, which brings back order into the chaotic system again. Thus everywhere, the world experiences transitions from chaos to order, and order to chaos again and again. The universe remains fine-tuned in a state shuffling between order into chaos, and vice versa, while maintaining the design intact in all.

Those cosmic bodies, which fall out of the pattern, and whose growth and evolution can not fit into the overall plan of the whole, will explode and get annihilated. From their debris new structures will take shape again. The structures, which follow the wholesome design of the universe, follow their destiny of decay as prescribed by the cosmic knot. They fall apart into a disorderly state before merging with the surrounding, and reappearing as the material needed for the birth of newer structures in other places. The decaying process may involve generation of plasmas from where new clouds of gases may appear in the interstellar, or integalactic, or intercluster spaces.

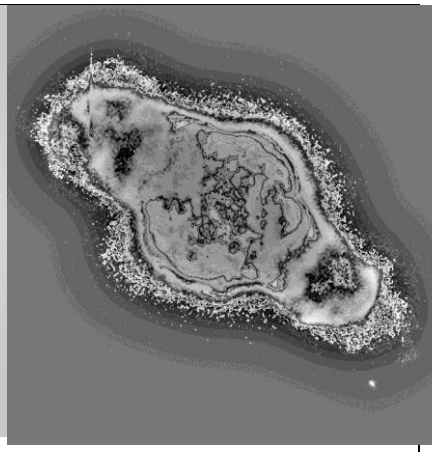
Thus, to mummarize, two modes of death and decay are often observed: One by explosive annihilation and the other by gradual decay by dispersing jets and debris.



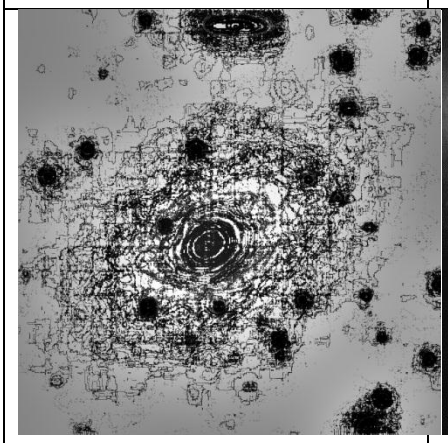
Decay of a redgiant star



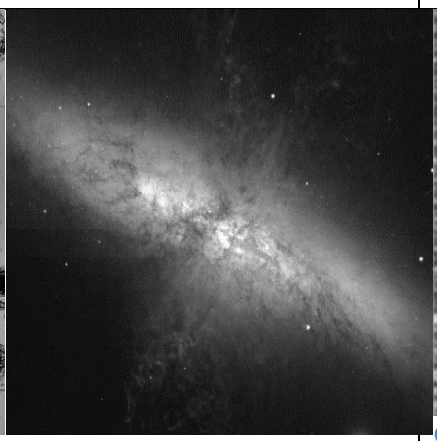
Exploding star



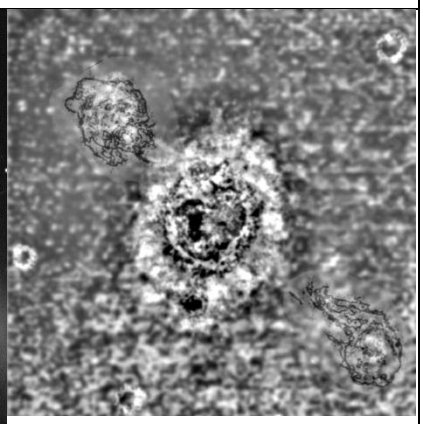
Disintegration of star by creating jets and flyers



Elliptical galaxy in the process of decay



Exploding galaxy



Galaxy disintegrating by creating jets and flyers

DEATH OF COSMIC BODIES OF DIFFERENT SIZES BY EXPLOSION AND GRADUAL DECAY

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Universe: The Great Symphony

The birth, evolution, death are all parts of a great design, a harmonic melody of a great song as described by the Celts known as Oran Mor. It never ceases, never ceased in the past and will never stop in the future. As the Celts conceived, it is synonymous with the creation itself, which never rose in the past at any moment of time, and will never come to an end in the future. The universe continues eternally its great harmonic enfolding and unfolding filling all creation, embodying everything as inseparable parts of the whole.

This great symphony is infinitely deep in structure, unfathomably complex in its arrangement, which reflects an inconceivable intelligence acting behind it. The universe is unbelievably profound, which

evokes the greatest sense of awe and wonder one may ever experience. However, this symphony is built in a simple way by follwing a template that I shall summarize below :

- Spiral triskele or triple spiral lies at the heart of all structures while weaving knots around them.
- The tightening of the knot brings evolutionary changes and causes the objects to undergo the process from birth to death.
- The weaving of the knot is so designed that as objects move from life to death they generate new bodies and set these new creations in a new cycle of life and death. It generates a cascade of creation of smaller and smaller bodies.
- Everything is finely orchestrated in every scale- how large or small the structures may be. The universe appears very similar in different scales i.e. it images itself in all its constituent parts in a self-similar manner.
- Using the mechanism driven by the spiral triskele, embedded at the heart of a fractal knot, the universe has organized all micro and macro-structures which must follow the destiny of its mother structure, while the cosmic symphony unfolds and enfolds at the same time. Thus, in parts there exist everywhere the reflections of the whole.
- Though ever changing everywhere in all scales, the profound design rooted in the fractal knot and triskele remains eternally the same. The changes bring consciousness of time, while time itself is rooted in a timeless design.

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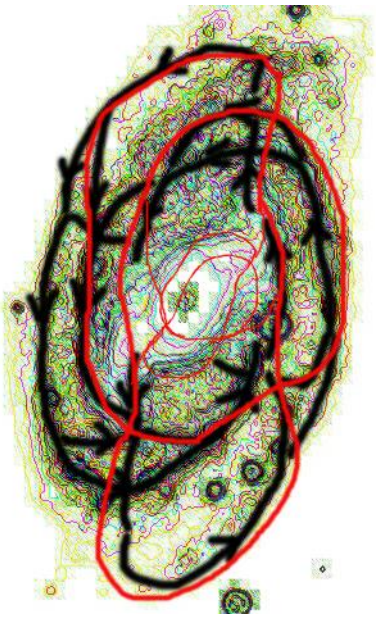
Eternally existing without beginning and end

The Great Melody that contains all existing beings, and puts all things in their appropriate course of the journey of life from birth to death, leads everything in the universe along entangled loops which has no beginning and end in space.



A fractal loop representing the structure of a galaxy

The example of the loop, forming the structure of the galaxy, shows how this endless loop may have formed in the universe. In the galactic scale, the incoming and outgoing streams form a loop which is a fractal. It means similar daughter loop emerges and ends inside the larger mother loop as in the Russian doll. Similar to the ingoing loops, the mother loop itself is embedded in its mother loop as one moves outward. This entangled loops, forming a structure, is a fractal knot, which represents a cosmic body at a particular scale. The filaments, or “threads”, with which such loops are made, are themselves made of knots, resembling the loop in a smaller scale. It is like making a loop with threads which is a made of a chain of knots. This larger knot is nothing but a knot tied with a chain of knots of a greater dimension. This endless formation of loops continues in smaller and smaller, as well as larger and larger scales. Such a loop does not begin, or end anywhere. By this way the universe is entangled in an endless arena.

The so-called objects of finite sizes, which we observe as cosmic objects, are knots woven around the triple spiral. These knots, in turn, are parts of a chain of knots forming a greater loop. This chain forms a cluster of knots, forming an even bigger structure i.e. an even bigger knot, and so on.

- **FINITENESS OF AN OBJECT IS AN OBSERVATIONAL ILLUSION. ALL OBJECTS ARE PARTS OF A LARGER LOOP FORMING FINITE OBJECTS IN THE NEXT HIGHER SCALE. SO IT GOES ON... FINITE REALITY REMAINS EMBEDDED IN AN INFINITE ARENA.**
- **EXPERIENCE OF FINITENESS WITH BEGINNING AND END IS THE RESULT OF THE WAY WE OBSERVE THE WORLD. THEY REFLECT OUR INCOMPLETE KNOWELDGE OF THE REALITY.**

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Who has created the universe?

After these querries how big is the universe, where does it begin and end, and how it is created, one wonders about the great question: "Who has created it?"

In the ancient world, people invoked the gods to explain the creation mystery. In the spirit of the ancient tales, in the Judo-Christian mythology God in the beginning had created the heavens and the earth. Darkness existed everywhere. God said, "Let there be light," and there was light. God divided the light from the darkness and made the expanse, which he called the sky. Then he divided day from night and gave birth to two great lights: The greater light ruled the day as sun, and the lesser light ruled the night as moon. He also made the stars.Then he went on in the task of creating the living creatures. The whole work of the creation of the firmanet was complete by the fourth day from the start.

Though the big-bang theory does not necessarily need God to create the universe, it keeps a resemblance with this story of the genesis. The universe begins as a ball of light and then expands creating matter from light. The process of creation follows a temporal sequence one by one:The matter pulls together and forms the stars first. From the stars all other cosmic structures come forth.

The new creation story presented here is totally different from this Judo-Christian scenario, and other ancient tales except that of the Celts. Celts did not talk about the creator, and the creation story. They talked about the Great Song which was synonymous with the creation itself.

In this Great Music, melodies and notes rise from the interactions of the whole, and the whole brings reverberations in all. It fine tunes every sound, even those lasting for the smallest fractions of time in the tinniest corner of the universe, to create a harmony and beauty of an immense dimension. One may name this song as one wishes. Einstein seemed to have called it God while he expressed the view "God reveals himself in the orderly harmony of what exists."

It is not someone creating something else. Instead, through the mediation of the triple spiral the micro-structures feed back energy to larger structures to sustain the existence of the macro-world. The macro-world keeps the micro-worlds in existence by supplying nourishment to them. Thus micro- and macro-worlds are existing eternally while supporting existence of each other. Things which create something are created by others in turn. The creator and the created ones are inseparably dependent on each other and tied in an entangled universe. Like every sounds of the harmonic music of Oran Mor, they all participate in the song which is synonymous with creation and creator itself.

- **INDIVIDUALLY ALL MICRO AND MACRO STRUCTURES ARE IMPERMANENT.**
- **ALL IMPERMANENT WORLDS CONTRIBUTE TO THE PERMANENT EXISTENCE OF THE WHOLE.**

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So no God, or God?

Before answering this question let us try to understand what we usually mean by God. For most individuals God is a concept inculcated from the religious traditions followed by the family, or by adherence to some culture, or by indoctrination. These views are colored by the mythological stories with which most religious ideas are framed. So, God bears different images and associations to most of us. Since the ancient time we have created God in our own image, and associated with him the benevolent nature which we wish to see in a kind father, or a ruler. We imagine him as almighty who can overcome all impassable barriers obstructing our ways and bring happiness and salvation from suffering. In most creation stories human beings are made from clay, or wood by the hands of God, who has breathed life in us. It is like a sculptor creating dolls and animating them.

No such God is the creator of the universe. God is the Great Symphony to which we are all parts. He is animating everything everywhere and existing in the same way in all by imaging itself in the similar way in the largest to the tinniest of creations.

One may ask: How such a symphony can play without a conductor? Yes, the conductor is not some one standing outside us - outside the stage of the universe. He is residing in us all as the triple spiral driving the dynamics of life, evolution and death. This triple spiral bears the mystery behind all creations as the mystics of all ages have known.

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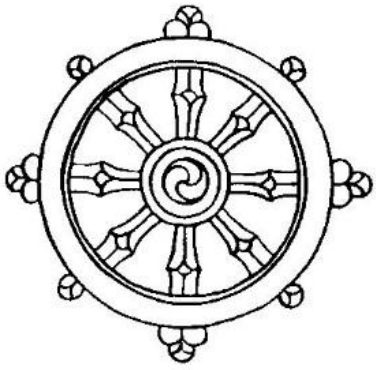
Mystic spiral

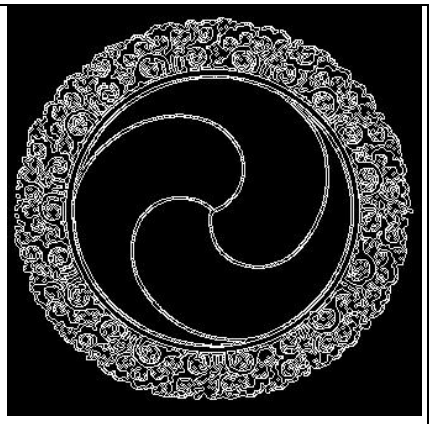
It is amazing to see that this triple spiral appears in many religious symbolism and mystic experiences. The Celts decorated the entrances of the Megalithic and Neolithic tombs with such triple spirals, which probably signified the divinity existing behind the process of life, death and regeneration. The Celtic knots, central in celtic mysticism, are woven around the triple spirals.

One sees it at the centre of the Buddhist Wheel of Dharma, and the Centre of the Chakras of the Hindus too. They symbolize the process which churns the creation without beginning and end. According to the Buddhists, the reality is a series of infinite changes – one passing over to the other – though the true essence of reality remains eternally the same. The changes are perceived as illusion, or Maya. There is no creator as such – something resembling the Great Song of the Celts. The universe is caught into a perpetual process of unfoldment and enfoldment eternally continuing for ever.

Celtic triple spiral design



Buddhist Dharmachakra



Gankyil : The inner triple spiral representing the primordial universal energy in Himalayan Shamanism and Tibetan Buddhism

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Revised Platonism with Celtic and Buddhist ingredients

The creation story of the universe, which I have presented above, differs from the Platonic ideas of the template bearing perfection and harmony of Heaven existing in the transcendental sphere, which the creator uses in creating the physical substances in the world. Though different from the Platonic ideas, there exists a template, which the universe uses in creating the world. I have described this template as consisting of three elements: fractality, knot formation and triple spiral. It is an extremely intelligent way of designing of the cosmos.

However, there is no Demiurge, who remaining outside the world in a transcendental realm, fashions the world. Instead, the creator is one with the emanent world itself – the Great Melody. It brings forth new worlds from within itself. It destroys the old parts to bring forth the new. While sinking and dispappearing in itself it rises from itself. The whole seems to be impregnated with a conciousness i.e. an intelligence which brings order amidst chaos, perfection amidst imperfection, permanence in an imparmanent existence.

In many ways the Celts and the Buddhists are closer to this new view of the creation I have described.

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WHAT HAS MISLED SCIENTISTS FOR HUNDRED YEARS TO BELIEVE IN BIG-BANG?

It is clear that the new view of the creation has very little in common with the model of the big-bang, which has received concensus among the sceintists for nearly a century. The two views are as different as the story of creation in Genesis, where the world is created by God, and the Buddhists conception about how universe works and creates things without invoking God.

One may then ask: "How come the scientists belonging to the prestigious institutions, who are all very smart people, got everything wrong, and you are right? What are the new things that give you the confidence to believe in the new universe which they do not know about? Given the unprecedented observational methods of studying the universe not only in visible wavelengths, but in many invisible realms like radio wavelengths, infrared, ultraviolet, x-rays and gamma-rays, how have they been led to pursue an erroneous model? Can you substantiate your claim by observational facts?"

I shall give here a short review of things that may give answers to these above questions.

What has led scientists to pursue an erroneous path?
First, the big-bang model has a cultural component. It has risen in the culture where the concept of time has been linear: Every event must have a cause, preceded by an another event, which in turn is preceded by another cause and so on.... continuing in a series defining the movement of time. The sources of these causes are always the immediate surrounding impacting on the objects and generating the events. In this series things happen locally, and the chains of local happenings decide the global destiny.

Second, the Greek foundation in reasoning and conceiving the nature of the world have paved the ground for the modern science, which has been truimphantly led by the western thinkers. The transcendental ideas of harmony, purity and perfection based on geometrical relations and the logical consistency of mathematical methods have inspired people in making models of Heaven and cosmos.

Third, once it was discovered that a mathematical model has been working well to describe the cosmic bodies lying immediate to us, like Newton`s theory of gravity, one made a hypothesis that the gravity must be the sole force behind the construction of the universe. The laws working well to describe the local events, were assumed to pervade the universe in the same way globally.

In the turn of the twentieth century, the Newtonian model of gravity was replaced by a more sophisticated geomterical model involving the curvarure of time and space. However, the arguments for a homgogeneous "spherical" universe remained in tact, and the gravity was believed to hold its sway over everything in the cosmos in the same way as it does in our solar system.

Moreover, when the big-bang model was first introduced we had a very scanty knowledge of the cosmos beyond our own Milky Way galaxy. With the discovery of the galaxies, lying outside the starry world, the big-bang theory got its life. Since then observations were made to support the model, and corrections were introduced to fit the observations. When a solution of the Einstein`s equations first showed that the universe must be expanding, Einstein corrected the equations to make the universe static. Soon Hubble showed that the newly discovered galaxies were receding from us. Then the equations were again altered to fit into an expanding universe. Since then several alterations have taken place to fit into the observational facts.

Thus starting from the days when we knew very little about the large scale nature of the universe, the scientists have embraced the big-bang model, and adjusted their understandings in step with the inpouring observational data. The theoretical model has inspired enquiries in weird territories like the search for

black-holes, dark matter etc., and the observations in different wavelengths have sprouted in tadem with the evolving ideas.

So, how such a tedious enquiry, where the observation and theory have supplemented each other, and devoured an expenditure of a gigantic scale, can go wrong? If it has gone wrong, why?

The major problem had been the blind reliance on a mathematical model before the true nature of the universe was more fully known. The observed recessions of the galaxies were interpreted as the expansion of the universe as the big-bang model had predicted. With it the time scale was set by the Hubble Law. The high speed galaxies were interpreted as objects lying far away from us, which meant looking back in time. They were believed to be moving in the early moments of the creation. This generated speculations and theories about quasars, and large scale structure formation.

Moreover, one arrived at the big-bang model with a hypothesis that the universe was homogeneous and isotropic, resembling a spherical ball in a higher dimension. At that time the ideas of the fractals were not in vogue, and the possibility that the universe could be an inhomogeneous fractal had no place in any one`s mind. Untill 1990s, when Sylos Labini had claimed for the first time that the universe could be a fractal, the ideas of the fractal were practically unknown in studies related to the cosmos.

After atoms were formed from the elementary particles, the universe was considered to be an arena controlled by the gravitational forces. Gravitational pull generated all cosmic bodies. There was an attempt to undersand the formation of structures as consequences of gravitational instabilities in clouds and the merging of structures caused by the gravitational attractions. The gravity reigned supreme everywhere. The gravity, as we know from the study of the solar system, was considered to the cornerstone in deceiphering the mystery of creation.

When the velocity pattern of the motions of the clouds in the galaxy failed to tally with our understanding of the gravity, one invented the ideas of the dark matter. It fitted into our assertion that the gravitational law, which we know from the solar system, can not fail anywhere.

Next, when the model, combined with observation, showed that the universe was accelerating at the present age, one resorted to the idea of the dark energy, akin to the term (vacuum energy) once introduced by Einstein to make the universe static.

Since the promulgation of the ideas of dark energy and dark matter, different amounts of these unknown stuffs have been used in building models to explain the way the different large scale structures in the universe may have fromed from gravitational instabilitis of homogeneous clouds of gases.

Then the most bothering questions were: What seeded these instabilities in a homogeneous universe, and which mechanism has brought forth the clumpy structures appearing as galaxies, clusters of galaxies, clusters of clusters of galaxies and so on?

In the early 1990s the first question received an anwer. Already in 1965 a radiation was detected known as the Cosmic Microwave Background Radiation. It was observed to be the same in all directions. This background radiation was interpreted as the remnant of a homogeneous fireball, from where the universe has emerged. The once extremely hot fireball was believed to have cooled down to a temperature of 2.73^{o}K of a black body emitting in microwaves. The discoverer of this radiation won Nobel Prize. Then in 1993 it was observed that the radiation was not completely smooth in all direactions. The temperature fluctuated slightly across the sky. This became known as the cosmic microwave background radiation fluctation and brought another Nobel Prize in Physics to the discoverers.

The observations of these flucuations helped in understanding the initial instabilities in clouds which could have given rise to the clumpy univers. The fluctuations were interpreted as the signatures of the ripples caused at the time of explosion. These ripples had gone bigger with the expanding universe and given rise to the formation of the structures, it was argued.

Now, with the use of different amounts of dark matter, dark energy and assuming a spectrum of the initial ripple at the moment of explosion, people create models to explain the power spectrum of the background radiation fluctuations which may fit with the observation. Some models seem to recreate the observed spectrum fairly well, thus giving rise to the claims that they have arrived at the final decisive moment of heralding the triumph of big-bang cosmology.

The faith in this model has increased to the extant that the world has spent 9 Billion dollars to build an instrument that will accrelerate particles at energies, which are assumed to have existed at the moment of the big-bang. It is also believed to help in understanding the question of the nature of the dark matter.

It is natural to ask: “How could these people after using so much expertise, best brain, enormous energy and money could go totally wrong? What evidence do you have when you challenge the big-bang? What new methods do you use to explore the universe, which others do not know?”

I shall discuss this now.

What is new?
My approach had been to understand the universe as it was from the point of view of observation, and not what any theory might predict, or say. I came to study the cosmos in the late 1990s, when people were sending gamma-ray satellites in the sky. My entrance into astrophysics came through my interest in understanding the sources of the gamma-ray explosions occuring everyday in the sky.

By this time several new developments had occured. Among them the most important was the availability of powerful desktop computers, which could serve the need of analyzing digital data coming from different satellite observations. Moreover, a large amount of observational data from different observatories could be accessed through internet without being a part of an academic institution, and holding an academic position as an astrophysicist. The easy availability of data, and the increased power of the personal computers gave an opportunity to explore the universe independent of the main stream academic pressure.

By this time quite sophisticated computer softwares, once used by NASA and other professionals were available at low cost. It coincided with my interests in computer graphics which gave me the advantage to avoid the technicians to interprete data as the middleman. My knowledge of the basic theories and techniques of image processing gave me an advantage in exploring the universe. I realized that lots of informations were lost in the way we may process the data.

A data set may contain many levels of information, which can be brought to visual studies by using computer techniques. We call them as seeing in false clors. An image revealed in different false colors may reveal different information. By superimposing all these information one may get a fuller view of what one may be observing. So this was my first steps to make a journey in the universe being observed in different wavelengths by the staellites and the telescopes.

I left aside the theoretical knowledge and turned more into a computer wizzard studing reality by using filters, tracing methods, gamma value corrections etc. Then the superimposition of different views,

obtained from analysing data taken in different wavelengths gave me the vision of a universe very different from what the big-bang theorists had been professing.

The universe, which I discovered, was a fractal that I have described in the preceeding chapter. Quite accidentally it was the subject that had been getting popularity in scientific discourses after Madelbrot had popularized fractal geometry since the middle of 1980s. By that time my interests were also drawn towards chaos theory, which was quite a new arena for most astrophysicists and big-bang theorists.

Realizing from the observation that the universe can not be a homogeneous sphere, I engaged in studying the fractal nature of the large scale structures, and looked into the velocity patterns existing in those objects. Thus I came across the universal cosmic knot, which was becoming tighter with the evolutions of cosmic bodies. This was a completely unheard of territories for both the theorists and the experimentalists.

While studying the evolution of galactic cores, I encountered the issues that Halton Arp was talking about since 1960s. Many galactic nuclei showed ejections of structures from the galactic centers. Arp had been trying to tell the scientific world that the so-called quasars, possessing high redshifts, were nothing but ejected objects from the Active Galactic Nuclei. The sceintific community had so far paid deaf ears to him. Indeed, I found Arp was right, though it contradicted the long held concepts.

Thus one by one most of the edifices built by the big-bang theory crumbled. As I analysed more and more the observational data, more and more I got convinced that the universe was a fractal, the evolution of structures were driven by a universal knot and the high redshift objects were ejections from the galactic cores. With it I discovered the existence of the triple spirals lying inside the womb of the cosmic bodies.

Nothing of these scenarios is compatble with the main stream cosmology. So who is right? The prestigious community of the scientists enjoying reputations all over world, or an unknown physicist, who has abandoned academic research in his lone pursuit for truth following his own unconventional methods? Let me hope that this book will help the readers to build their own opinions.

Many people asks me what is your theory? What mathematical model do you use? Can you simulate your universe in the super computers? Without simulating, I can see that I exist with the human features which I possess. With no theory and simulation I shall be able to generate this grand existence of mine, which I perceive so well with my senses and mind. Very similar is the case with the universe. When the layers of informations are put together to the eyes through the help of the computer I see it in its grand unfoldment and design. I see how difficult it will be to make a mathematical model of this cosmos. I realize the paucity of our mathematical knoweldge with which such an entangled universe existing as knots inside knots inside knots can be described.

So do I have any theory? Once one realizes the similarity of construction of the universe with the whirlpools, in some way one may put up arguments, which may seemingly appear as a theory. However, it is extremely difficult to build a mathematical model of so chaotic a system as the whirlpool. Best one can do is to describe it by a multifractal model involving statistical measures. Beyond that, to make a full mathematical theory of the whirlpool, where the global happenings in macro-scale are intimately entangled with the local happenings in the micro-scales may be beyond the capacity of any mortal.

If it was simply a whirlpool, the problem could have been easier. The universe shows not only similarity with the wirlpool but also the cosmic bodies follow a evolutionary pattern reminiscent of charged entangled loops underging contraction and tearing as the final end. A knot theoretic foundation is needed

to describe such a universe. A theory of fractal knot entangled in scales inside scales may lead us to the right path.

The final complexity arises due to the involvement of turbulence and magnetic fields together with the gravitational forces in the construction of the universe. While turbulence generates a magnetically active universe, one needs to deal with a siutation where gravity and magnetic fields are intimately coupled with the turbulent kinetic motions of the gases. At this moment it sound hopeless to make a mathematical model of such a universe that can be simulated in a supercomputer.

To be trustworthy one should be able to test the assertions made by this new "theory". What predictions can it make which the experimentalists may verify? The three fold elements universally existing in all scales are all observables. One should be able to test the fractal nature, the existence of the knot entanglement and the triple spiral at the centres of structures as I have pictorially demonstrated in the preceeding chapter (they are all derived from observational data). Beside that one must be able to observe the ejections and cascades of higher red shift objects. One should also be able to confirm the roles ofturbulence and magnetic fields in building the structures in the universe. Statistical quantities which are used in describing turbulence should be an easier way to test the basic nature of the formation of structures. In the absence of any other tractable mathematical model the quantification of the fractality, and knot strength can only follow from more observations. Once the basic picture is thus confirmed one may proceed in developing ways to quantify the universe.

Alternative explanations

How do this new universe explain the observations which support the claims of the big-bang theory? What causes the galaxies to fly from us? What has genertaed the Cosmic Microwave Background Radiation? Why do we see fluctuations in the background radiation? What causes the galaxies to rotate with such peculiar velocity pattern? Why the universe accelerates?

The answer to the first question lies in the position of our own galaxy in the whirlpool universe. The Virgo supercluster, to which our galaxy belongs, lies close to the center of the whirling cosmos, which makes the galaxies appear flying from us.

The answer to the second question: The universe may be filled with cold molecular hydrogen, which can generate $3^{o}K$ microwave radiation. It follows arguments very similar to the ones once provided by Fred Hoyle in support of the Steady State Theory - the only theory which challenged the Big-bang so far.

Third question will disappear once one realizes that the origin of the fluctuations is not primordial. They have local origin as I shall explain in the end.

The question of the rotation of the galaxies can be understood once one recognizes the way the galactic dynamic works through the formation of a fractal knot which is more tighter towards the center. As I have explained in the preceeding chapter, the galaxy does not rotate the way the planets rotate around the sun. It follows more the velocity pattern seen in a whirlpool, which can explain the observations without the necessity of invoking the existence of the dark matter.

The question of the acceleration of the universe and the existence of the dark energy are relevant only if one believes in the big-bang model. It has no place in the new universe.

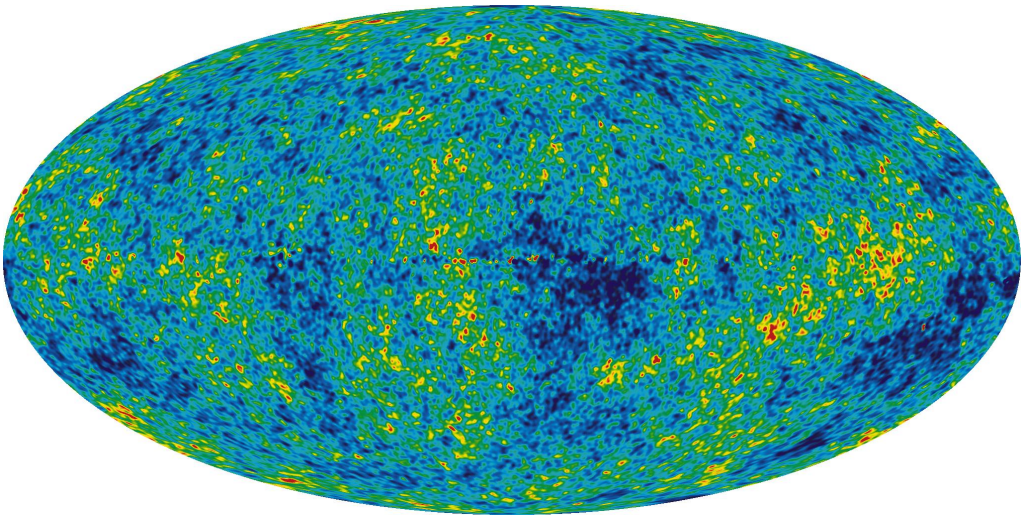
Now let us come back to the question of the fluctuations of the cosmic microwave background radiation. The latest measurements of these fluctuations have been taken by WMAP (Wilkinson Microwave Anisotropy Probe) and they are considered to provide the most significant support for the Big-bang

model. With this model, which uses dark matter and dark energy, one has been able to compute the power spectrum of the fluctuations which seems to tally with the measurements.

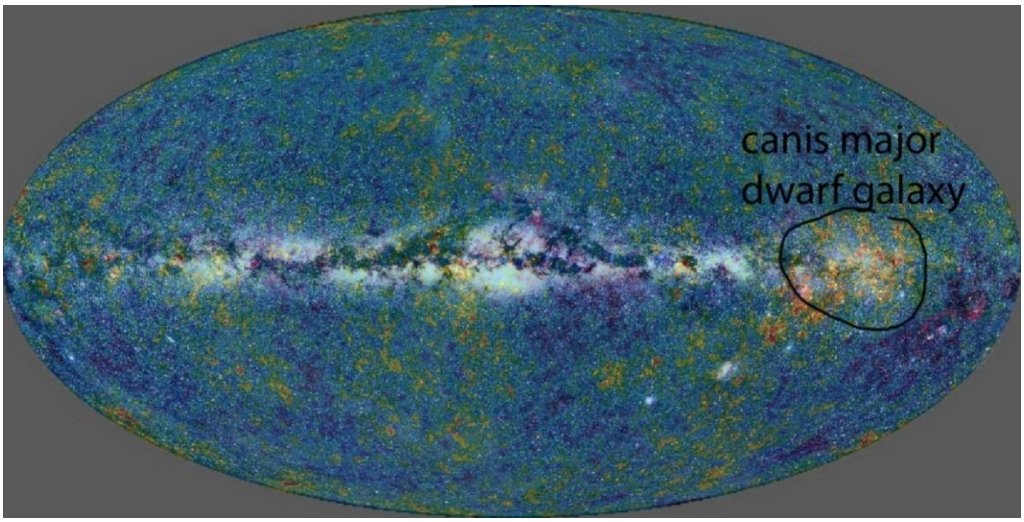
Could it be a hallucination? May the so-called fluctuations measured by WMAP really come from dusts and gases lying close to our own Milky Way Galaxy?

How come it is possible that WMAP team, made of so many scientists from so many famous scientific institutions of the world supporting such a prestigious project have not found out what I am saying?

In the following pictures I shall illustrate the facts supporting my assertion and leave it to the readers to wonder about the answer to the above question.



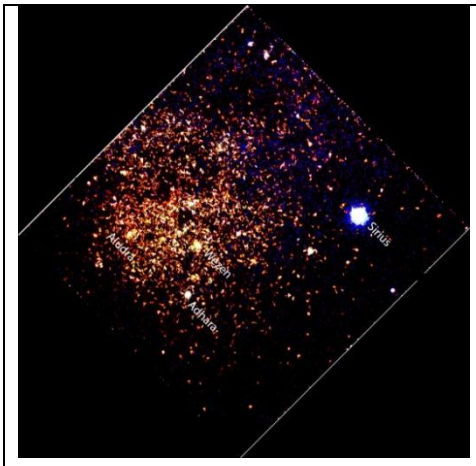
Latest WMAP data showing warmer fluctuations in warmer colors



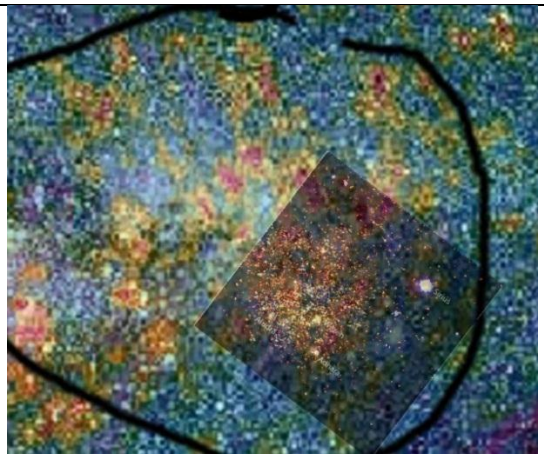
WMAP fluctuations with respect to our Milky Way galaxy. The galactic centre lies near the middle of the picture.

Example of Canis Major and Vela Puppis region of the sky

The fluctuations shown by WMAP team after removing the contaminations from the Milky Way galaxy shows that what are presented as the primordial fluctuations are really nothing but fluctuations generated by dusts and gases near our galaxy. The best examples are the fluctuations around the region of the sky falling in the constellations of Canis Major, Vela and Puppis. These fluctuations bear one to one correspondence with the dwarf structure in Canis Major discovered in 2003, and the streams of gas and dusts in Vela and Puppis moving towards the Large Magellanic Cloud (LMC) which is a dwarf galaxy near the Milky Way.

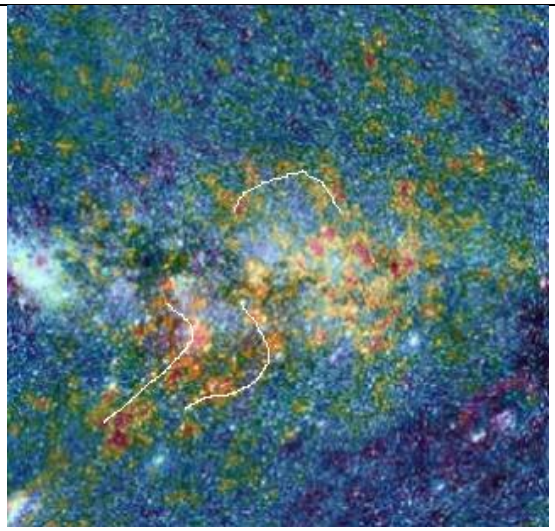


Dwarf galaxy in Canis Major



The dwarf galaxy is the source of fluctuations in Canis Major

Dust lanes in Vela and Puppis seen in red colors



WMAP fluctuations follow the same lanes marked in white

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MOST OF THE FLUCTUATIONS IN THE COSMIC MICROWAVE BACKGROUND RADIATION ARE CAUSED BY LOCAL STRUCTURES