

# Nature and Its Cyclic Path

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## Abstract

Our Sanatana dharma has marvelously introduced the concept of birth and death as the elevated or cyclic path of complex-coupled nature in terms of legends and karma (action). According to this, a new universe is brought into existence through the transformation of Moola Prakriti/Pradhana (Universal primitive/root matter) by Sanatana Para Brahma (= Sat+chit+Ananda = Satyam+Ritam+Brihat +Anantam) from the state of total dissolution. Many Vedic theories style this as 'forming from Parama Shunya = Avyakta Aakaasha (Om Kham Brahma from Shukla Yajurveda). This indeed makes a hallmark approach to understanding the nature of the Supreme Divine = Paramaatma, through the Vedas and Sanatana Dharma. In this article, the authors make an attempt to discuss Time, Space, Universal singularity, and Karma theory, using the Progressive discoveries from the physical and Biological Sciences, particularly those of Material science and Evolutionary Biology.

**Key words:** Nature, cyclic path, Karmic action, *Rig-Veda*, singularity, cosmic paradox, evolutionary science

## Introduction

Nature has always been a panorama for observation and understanding of the universal grand design, starting from the Big Bang (chaos) to the present modern age. This broad spectrum certainly confirms the following couplet:

**The existence of nature is not a miracle,  
But its absence would be one!**

Scientists have always marveled at the origin of the world and tried to explain it with a number of hypotheses. The one that is accepted and being used in the present age is Quantum field theory. It is believed that the Universe (nature) is a self-organizing, complex-dynamical, chaotic, multiple-feedback system, following an evolutionary

path right from the Big Bang over the past 13.8 billion years. New discoveries are contributing to improving our understanding of the theory of Cosmic (including life) Evolution. Based on the theories, one can conclude that life forms (entities of living) are constrained by nature's laws and incapable of violating them, and vice versa. So, it is a kind of mutually coupled Autopoietic system. The same thing has been stated by many Hindu texts: *Karma* (Activity) and *Maaya* (Supreme Screening Power) are coupled with each other. Nature follows its own specified path, depending on the Karmic actions, at the points of multiple paths influenced by dynamic feedback.

In view of the aforementioned puzzle, an attempt is made in this study and discussed

in the following sections. The different methods adopted in our mythological aspects of nature worship clearly explain to us that nature is a system with a chemical nature of an auto-cyclic system from birth to death, then again to birth, and so on. A few questions that arise in this context are: 'Why is only this type of system prevalent? What is its purpose? What is the size of the universe? In addition, the following paradox, which is prevalent globally, is clarified by a philosophical approach, discussed in *Rig-Veda* (10-129-7, Nasadiya Sukta) [1].

इयं विसृष्टिर्यत आबभूव यदि वा दधे यदि वा न ।  
यो अस्याध्यक्षः परमे व्योमन्त्सो अङ्ग वेद यदि वा न  
वेद ॥

*"He is the first origin of this creation. Whether he formed it all or did not form it. Whose eyes control this world in the highest heaven? He verily knows, or perhaps he does not."*

### Studies - A Philosophical Approach

Hinduism is built on a system driven by ethics within the universal frame and showing a path from darkness to light. After the big bang, the universe began to expand, and it is still continuously expanding. Stars will be born, grow, and explode in supernovae. From the star dust, new stars, perhaps smaller ones, will begin to evolve. The brilliant flashes of intense radiation from supernovae have shown a path for understanding the evolution of stars and planetary systems. In understanding this phenomenon, an important parameter is the average density [2]. If the average density of stars increases, the universe ceases to expand and collapses back into a singularity. This would lead to another big bang, and this cycle repeats over and over. On

the other hand, if the universe is less dense than its true value, it will be open and continue to expand forever. There will be no end until it reaches its own critical value, then a new universe will be born from the remnants of an earlier universe. A hypothesis says that we cannot measure the density of the universe so accurately. To understand more about this, the physicist's approach is as follows:

#### Time:

Based on the Archimedes calculation, one can say that the size of the universe is equal to the square of size of solar system divided by size of the earth. He has concluded that the universe could hold  $10^{63}$  grains of sand [3, 4]. Bhagavata purana says that cosmic egg (universe) has a diameter of 500 million yojanas ( $5 \times 10^{15}$  yojanas  $\sim$  6.8 trillion light years in diameter) [5]. But according to the modern scientific calculation, the size of universe is almost seven (7) trillion light years [6], almost as same as that of quoted by Srimad Bhagavata Purana.

Though physics has developed a lot, still this cosmic puzzle is yet to be solved, for two reasons. Firstly, it deals with fundamental constants, and secondly it requires lot of approximations [7]. Moreover, if the main dimensionless cosmic equations are plotted on a logarithmic scale, then it forms two groups, namely large and small (unitary) groups respectively. The fundamental constants G, c and  $\hbar$  give rise to the following relations [7]:

$$\begin{aligned} \text{Planck's length} &= a^* \\ &= (\hbar G/c^3) \sim 2 \times 10^{-33} \text{ cm} \end{aligned} \quad (1)$$

$$\begin{aligned} \text{Planck's mass} &= m^* \\ &= (\hbar c/G)^{1/2} \sim 2 \times 10^{-3} \text{ g} \end{aligned} \quad (2)$$

$$\begin{aligned} \text{Planck's time} &= t^* \\ &= a^*/c \sim 6 \times 10^{-43} \text{ s} \end{aligned} \quad (3)$$

Here, the terms  $G$ ,  $c$ , and  $h$  represent the Universal gravitational constant, the velocity of light and Planck's constant ( $h = h/2\pi$ ). The above mentioned time duration is referred to as 'jiffy'. Finally, it is derived hypothetically that the size of the universe is equal to  $L/a$ . Here the terms  $L$  and 'a' represent Hubble length and radius of the electron respectively. It is a known fact that  $G$  changes with time as the universe expands. Therefore, one can say that the above defined relations change, if  $G$  alone changes with time. This kind of paradox is well explained in the Srimad Bhagavad Geeta (chapter 11, verse 32) as "kālo 'smi loka-kṣhaya-kṛit pravṛiddho..." [8].

कालोऽस्मि लोकक्षयकृत्प्रवृद्धो लोकान्समाहर्तुमिह  
प्रवृत्तः |  
ऋतेऽपि त्वां न भविष्यन्ति सर्वे येऽवस्थिताः  
प्रत्यनीकेषु योधाः ॥

The Supreme Lord said: "I am mighty Time, the source of destruction that comes forth to annihilate the worlds. Even without your participation, the warriors arrayed in the opposing army shall cease to exist".

A more plausible explanation given for Time (*kala*) and space (*distance*), described in *Rig-Veda* (1-95-7) as [2]:

उद् यंयमीति सवितेव बाहू उभे सिचौ यतते  
भीम ऋञ्जन् |  
उच् छुक्रम् अत्कम् अजते सिमस्मान् नवा  
मातृभ्यो वसना जहाति ॥

"Both time and space are eternal. No one can imagine origin and limit of Time and Space.

*Space contains everything and makes our moments possible.*

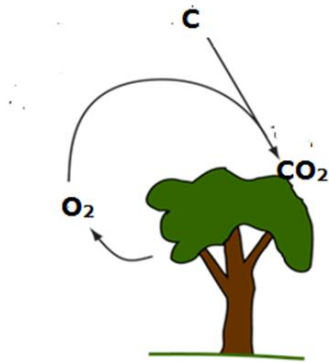
*Times conditions and regulates the generating growth and dissolution of every material thing."*

Both unmodified time and space are not perceived by our senses. However, they can be perceived by the intuitive power of our soul, at the stage of moksha (*kaivalyam*). Here, one should remember that God lives in time and space, and moves with the time. In other words, Time-god is a coupled nature or phenomenon and cannot be separate out. Time and space are God's *vibudhi*. The same concept was indeed introduced by Albert Einstein as "time and space are inextricably linked coordinates".

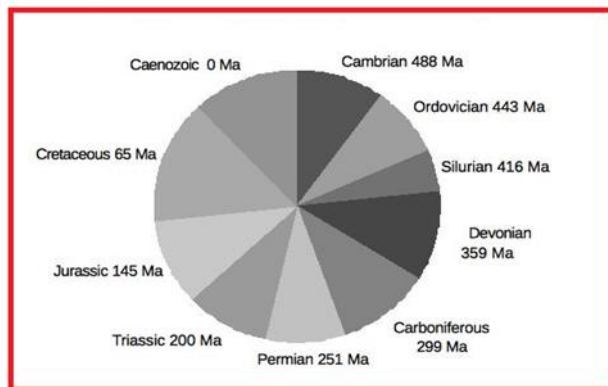
### Universal singularities:

With Carbon-14, radioactive isotope, found in the earth's atmosphere, one can arrive at an estimate of the archeological eras, to a reasonable accuracy [9]. The carbon-cyclic process is shown in the Fig. 1. Plants are autotrophs, which mean they can prepare their own food by means of photosynthesis processes. During this process, plants take in carbon dioxide ( $CO_2$ ) and water ( $H_2O$ ) from the air/soil. Here, water gets oxidized (means loses electrons), while the carbon dioxide is reduced (gains electrons). Thus, water transforms into oxygen and the carbon dioxide into glucose. The plant then releases the oxygen back into the air, and stores energy within the glucose molecules. Finally, humans and animals have survived by eating plants. A carbon-12 isotope is abundant and remains stable in the atmosphere; however, carbon-14 isotope decays into nitrogen-14 with a half-life of 5730 years [9]. However, this method has

some limitations like carbon contamination and animal based -glues. On the other hand, industrial and nuclear wastages certainly pollute the atmosphere and one cannot estimate the true archeological period is given in the Fig. 2a [Wikipedia].



**Fig. 1:** Carbon cycle



**Fig. 2a:** Archeological survey (Ma = million years) [Wikipedia]

Darwin's theory, proposed in the early 19<sup>th</sup> century explains well about the diversity among living beings. But it could not properly explain the following striking discrepancies:

- (i) Why this diversity exists?
- (ii) Transformation of one species to another kind.

The above two effects can be generalised again on the basis of two factors: (a) survival

of the fittest and (b) Random mutations. These have been modified by nature and nurture coupled with discoveries in epigenetics. Life forms have evolved in response to cosmic and terrestrial homeostatic and actastrophic phenomenon. If these two factors were absent then, all animals would live and might have maintained an eco-balance system. As environment changes from time to time and therefore species get adapted to their own characteristic features. This might have resulted in different skin colors across the globe. Monotheistic religions do not approve the theory of Evolution, from one kind of species to another kind.

In various faiths, it is broadly believed that animals, with specific characteristics suited to adapt to prevalent atmosphere, were created by God around 6000 years ago. This is in contradiction to the evolution theory, based on the science. So they have concluded that the Darwin theory is false because God cannot be false. In addition, the most puzzling question is why does a particular species exist and what is its purpose? This question was answered well by Hinduism in the following karma theory.

The origin of life began with some chemical reaction of molecules to form amino acid and then gradually evolved into a single cell and then into multicellular organisms. This kind of complex evolution can be corroborated to the *Dasavathrams*. The main transformation from one species to another species depends up on the following karma theory [10]. Based on the individual spiritual power, the classification is:

- (i) *Adhibhutam* (physical phenomenon or created at a certain point and will be annihilated at a certain point)

(ii) *Adhidaivatam* (the conception of the universal form of the Supreme Lord, which includes all the demigods and their different planets)

(iii) *Adhyatman* ('highest soul.' atma, means 'self' and *adhi* means 'above')

Our Vedic science has always shown a pattern of cyclic nature.

पुनरपि जननं पुनरपि मरणं पुनरपि जननी  
जठरे शयनम् ।

इह संसारे बहु दुस्तारे,... भज गोविन्दं भज  
गोविन्दं गोविन्दं भज मूढमते ॥

The above thought provoking couplet given by Sri Adi Sankaracharya [11] raises the two most significant and puzzling questions like "Why this world is existing?" and "What is death?"

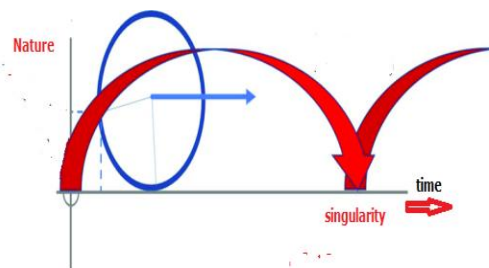
A cycloid is the path described a point on a circle rolls along a straight line. Here, the point on the circle is life and the path is in action. Moreover, this kind of cycloid path is largest path and follows simple harmonic motion (or sanathan or ideal Dharma) under the gravity or the nature. A death and birth process (event) would occur at each singularity where cycloid path touches time axis. This chain process will continue and may even break and results into the beginning of a new universe. A schematic diagram of cycloid path is shown in the Fig. 2b. According to the *Rig-Veda* (6-9-4), Time or God defined as [10]:

अयं होता प्रथमः पश्यतेममिदं ज्योतिरमृतं  
मर्त्येषु ।

ध्रुवं ज्योतिर्निहितं दृशये कं मनो जविष्ठं  
पतयत्स्वन्तः ॥

"He is first invoker. Look at him and this light immortal within mortals.

*The firm light, which is blissful and subtler than the mind, is hidden within the senses. The spirit is hidden within the creatures."*



**Fig. 2b:** Nature-time graph (cycloid path)

### Nature and Karmic results (Universal law)

The microscopic origin of the materials can be explored from the asymmetric behavior of the imaginary part of the impedance (respond function) with frequency (inverse of time), in a close proximity. To extract more information about inherent (dielectric) nature and relaxation (switching over) phenomenon, on natural substances (banana, botanically named as *Musa acuminata* Colla), kidney stone (became sick, due to bad habits) and barium titanate ceramic (man could also develop useful substances like  $BaTiO_3$ , referred to as technologically promising electro-ceramic, being used in many sensors). A detailed aspect of this is already discussed elsewhere [13].

Electrical impedance ( $Z$ ) and phase angle ( $\theta$ ) were measured using impedance analyzer as a function of frequency in the radio frequency range (1 KHz to 1MHz) at room temperature. A change in real and imaginary part of impedance ( $Z'$  and  $Z''$ ) with frequency at room temperature for a banana peel sample (BP), kidney stone sample (KS) and barium titanate (BT) is shown in Fig. 3(a-c), respectively. From the plots, it is clearly observed that  $Z'$  minima falls on  $Z''$  maximum

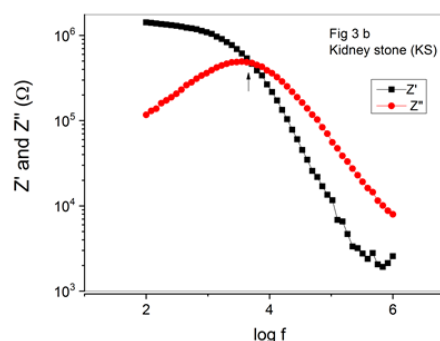
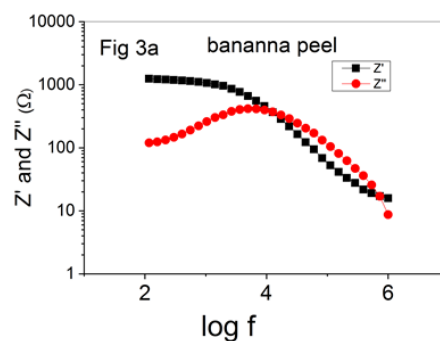
value. This trend is generally attributed to ideal (classical or Universal or Debye nature) [14]. From the log-log plot it is clearly seen that the data is found to fit linearly. Moreover, the linear-nature and having exponent, less than unity, confirms the small deviation from ideal (classical) behavior. The universal relation is explained by the equation,  $f \propto B\omega^n$ . Here,  $f$  and  $n$  denote the response function and exponential value. The value of  $n$  is related to the linear nature of the respective plot. Based on the linear nature one can speculate that the KS and BP samples are belonging to Debye (ideal) type. Here dielectric dipoles become dominated in KS and BP unlike BT sample, where mobile charge carriers affect the overall collective (dielectric) properties. Since KS and BP compounds have water traces, and therefore the water molecule may play role in the inherent (dielectric) properties. A noteworthy aspect of dispersion observed in the high frequency region for KS sample indicates that the kidney stone has a high degree of disorder nature. In our earlier studies, FTIR peaks (weak bands observed at  $1620\text{ cm}^{-1}$  and  $661\text{ cm}^{-1}$ ) were ascribed to the bending and wiggle modes of the water ( $\text{H}_2\text{O}$ ) molecule (see ref.13). Based on the intrinsic (dielectric) nature of the kidney stone, it is concluded that the properties of the kidney stone could be related to their behavioral due to the food-habits. Moreover, the aggregation and adhesion of particles may help the growth of the kidney stones in vivo. With a proper diet, good-food habits and proper drinking of water, one can arrest the growth therapeutically [15]. The *Rig-Veda* (10-5-1) says:

कः समुद्रो धरुणो रयीणाम् अस्मद् धृदो  
भूरिजन्मा वि चष्टे ।  
सिषत्तय् ऊधर् निण्योर् उपस्थ उत्सस्य मध्ये  
निहितम् पदं वेः ॥

*“He is one ocean, contains all matter having many births he sees inside our hearts.*

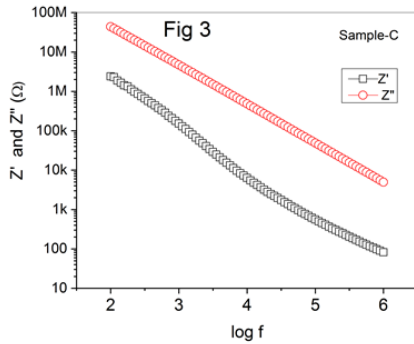
*He suckles the lap of the secret couple; the dwelling place of the Bird is within the fountain.”*

A detailed aspect of this is already demonstrated in our Yoga. Our Vastu (a traditional Indian system of architecture based on ancient texts) balances the five elements (*indriyas*) namely, the hearing, vision, breath, touch and fire (*agni*). Any disorder in human body indicates the imbalance of one or more elements. Thus, by adopting Naturopathy (yoga), one can improve or overcome any disorder. In brief, the following table 1 summarizes all the association of *bhootas* and its characteristic senses [15, 16].



**Table 1: Bhootas and Its Characteristic Principles**

<i>Bhootas - Elements</i>	<b>Human body</b>	<b>Associated finger</b>	<b>Characteristic principle</b>	<b>Sense organ</b>
Akash (space)	Astral body	Middle	Sound	Ears
Vayu (air)	Air	Index	Touch	Skin
Agni (fire)	Body heat	Thumb	Appearance	Eyes
Jal (water)	Water in blood	Little	Taste	Tung
Pruthvi (earth)	Flesh, bones	Ring	Smell	Nose

**Fig. 3a-c:** Variation of real and imaginary part of impedance vs. frequency

### Conclusions and future scope

The life and nature are interrelated and they satisfy the function-property, scientifically known as singularity. This cycle repeats over and over or even forever.

वि मे कर्णा पतयतो वि चक्षुर् वीदं ज्योतिर्  
हृदय आहितं यत् ।  
वि मे मनश् चरति दूरआधीः किं स्विद्  
वक्ष्यामि किम् उ नू मनिष्ये ॥

“My ears and my eye fly forth strive to see the light that spread wide within the heart.

My mind wanders far away-what I can speak of, and what can I think?” - (RV 6-9-6).

It is generally believed that religion and science are two distinct lines of thought and seldom agree with each other. A correlation between science and religion may be arrived by detailed studies on various Mandalas of *Rig-Veda*. Repeated study of *Rig-Veda* uncovers layers of information based on a deeper understanding. *Rig-Veda* is a collection of studies and praises of prevalent forces in nature and it can protect our well-being.

ऋतस्य पदं कवयो नि पान्ति गुहा नामानि  
दधिरे पराणि ॥

“The sages protect the dwelling place of the Cosmic Order (or Motion), and take on higher secret names” - (RV 10-5-2.2).

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