

# Space, Time and Information: Toys in the hands of Lord Venkatesha

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## Abstract

Building on some of the most phenomenal theories and observations of science, this article probes deep into the nature of the three fundamental entities of the universe: space, time and information. Through a series of implications and inferences involving Indian Spirituality, one sees these entities in the three Shaktis of Iccha, Jnana and Kriya, as well as in the Avatars of Varaha, Narasimha and Rama-Krishna-Kalki. Importantly, one sees these three entities as the three ‘toys’ – Shankha, Chakra and Thirunaamam of the Lord Venkatesha, who is the Universal Mother Herself as the Kali-Yuga salvation yielding form of Baalaa.

## Introduction

Ever since man’s understanding of the natural world matured in leaps and bounds, scientists and philosophers alike have always been fascinated about the nature of space, time, their interrelationship, and their relationship with matter. With the advent in quantum science and neurobiology, information has also been added to this mixture, since it is now understood that it is information, in the form of quantum wavefunctions, that play a major part in determining the existence of various matter and force carrying particles, which in turn constitute matter and energy respectively.

Taking a spiritual dimension to this, one finds that man’s fascination about space, time and information is not all that new. In fact, after careful understanding of implications and references of various scientific theories and results, and after proper associations and understanding of the various anecdotes and allusions, one comes to the conclusion that the concepts of space and time are enshrined in two very familiar icons of Indian Spirituality: the Shankha (conch) and Chakra (discus) of Lord Vishnu. Information on the other hand, is enshrined in the third eye, usually seen as is in Shaivite, or as the Thirunaamam (Tilak) in the case of Vaishnavite deities.

We start with the premise that Lord Venkatesha is the Universal Mother Herself as Baalaa, with this form in particular as the salvation for the present Kali Yuga. With this basis, the ‘toys’ of the Lord, namely the Shankha, Chakra and Thirunaamam are explored in the perspective of space, time and information. We encounter in these explorations, crucial results in the fields of Relativity and Quantum Physics, and understand how these universal truths are enshrined in the hands of the Lord Himself.



The Toys of the Lord

## Time

### A. Entropy: A Marker of Time

Let us start with a simple thought experiment: Suppose one sees a ball of unknown material in a particular place, and one is informed that the ball has always been and will always be there in that place, stationary without any movement. Then, photos taken of that ball at different instances of time are presented to an observer. Since, these photos at different time instants look exactly the same, the observer is not able to tell which photo was taken earlier or later than which other photo.

However, probing deep into the nature of matter, one knows that the ball cannot have existed since time immemorial, since the whole universe started out of a Big Bang. Thus, the state of the ball and by extension, the universe, during the big bang and during the present instant is different. This ‘difference in state’ forms a ‘marker’ through which we can understand time.

This difference in state is nothing but entropy. As the Second Law of Thermodynamics states, Total Entropy, which is a measure of uncertainty and disorder, always increases in a system over time [1].

In essence, the universe is always moving from a state of lower entropy to a state of higher entropy. This is seen as the reason why cause precedes effect, a phenomenon popularly known as the ‘Arrow of Time’. This is the reason why time flow is always unidirectional – from past to the future.

### B. Kriya Shakti: Goddess Kaali

Following from the marker of time, we note that entropy increase, or change in state, is the very basis of time. Change in State is nothing but ‘work’, and thus, the energy of time is the capacity to do this work. This force of work is termed Kriya Shakti, seen as Goddess Kaali.



Goddess Kaali represents the innate force pervading throughout the entire universe, whose effect is seen as the constant increase in entropy, marking the very flow of time.

Kaali is portrayed as the Goddess of death and destruction. This is because upon death, an organism loses its organization and structure, decays, decomposes and eventually merges with the surrounding; a classic case of spontaneous entropy increase.

### C. Narasimha Avatara

As seen, Time represents the overall increase in entropy in the entire universe. Thus, it is representative of the ‘trajectory’ (path) taken by the entire universe, which can be called the ‘big picture’. All living and non-living things are constituents of this big universe, which are also being pulled along this trajectory. However, by individual property, these constituents might be conducive or detrimental to the smooth flow of this trajectory.

It is the nature of time to enhance elements conducive to the universal trajectory and eschew the elements detrimental to it. This is the essence of the saying ‘Time Heals’, especially in social relationships, where all conflicts and awkward elements slowly dissolve away with time.



In Indian Spirituality, this distinctive nature of time is seen as the Avatara of Narasimha. Even though the Asura Hiranyakashipu and his son Prahlada are essentially the same blood, the Lord as Narasimha kills Hiranyakashipu, who is detrimental to the peaceful progress of the world, while saves Prahlada, who with his sincere devotion is a true treasure to be cherished. The emergence of Lord Narasimha from a pillar indicates the all pervading nature of this 'Time Trajectory', corresponding to the Kaala Bhairava aspect of Shiva.

#### **D. The Lord's Chakra**

The concept of time, seen hitherto as the 'Universal Trajectory of Increasing Entropy', is represented by the Lord's Chakra (discus), which represents Kaala Chakra, or the wheel of time, in His right hand. But, what is the symbolism behind the wheel?

The wheel emphasizes the fact that time is not perceived as linear, but rather as logarithmic, which can be understood from the following example.

When an organism completes its second year of life, significant changes are seen compared to a year ago, when it completed its first year. This is because, from the first to the second year, the life of the organism has increased by a whole 100%. However, from the second to third year, only a 50% increase in life span is seen. The fourth year brings another 25%, fifth brings 12.5% and so on. When an organism moves from forty years of age to forty one, the addition is very small. Thus time is perceived as decreasing in value with successive additions.

However, this logarithmic pattern of decaying value is cyclic. For example, moving from 100 years of age to 200 years of age is the exact same perceived value as moving from one year to two. Thus the pattern 100,200,300,400,500... follows the same perceived value as 1, 2,3,4,5... This explains why time is represented as a cyclic wheel (Kaala Chakra).

## **Space**

#### **A. Space and the Big Bang**

Unlike time, which is one dimension and unidirectional, space has 3 dimensions (length, breadth and height) and is bidirectional – one can move both forwards and backwards in all 3 dimensions. Thus, space does not have a direct marker such as entropy.

Space, usually in association with time as space-time, is the very framework in which the universe operates, and is best seen as frames of reference with the axes of X, Y and Z. Though this might give an impression that space is absolute and not affected by what it contains ('matter'), Einstein disproves such a notion in the phenomenal Theory of General Relativity [2].

In summary, General Relativity says this, termed here as the MAXIM-X: Space-Time tells Matter how to move, and Matter tells Space-Time how to curve.

In light of this strong inter-relation, how do we understand space? For an answer, we need to look at the very origins of the Universe – the Big Bang.

According to this theory, the initial state of the universe was a singularity – a single dot, which in essence is 0-Dimensional. Following this was the ‘Big Bang’, at which stage, the universe starts to expand. This is where the universe starts assuming the three dimensions of space. Thus the ‘agent’ of space, causing its creation is that expansion of the universe during the Big Bang.

What happened after the universe started to expand? Cosmology has the answers. Specifically, using parameters such as energy density, pressure, curvature, rate of inflation, kinetic (K) and potential (U) energy, and writing the Einstein Regge Equations in a Friedmann Robertson Walker form, one identifies after initial expansion scenarios, three different cases, as follows [3]:

1. Ordinary Matter and Radiation, where  $K > 3U$ .
2. The mysterious Dark Matter with non-inflating negative pressure, where  $U < K < 3U$ .
3. The vast and expansive Dark Energy, where  $K < U$ .

Thus, the very nature of space can be understood in the universe’s initial expansion since the Big Bang, and the forces behind it.

## **B. Iccha Shakti: Goddess Bhuvaneshwari**

The influence behind the initial expansion of the universe, is seen as the power of Will, termed Iccha Shakti, and represented by Goddess Bhuvaneshwari.



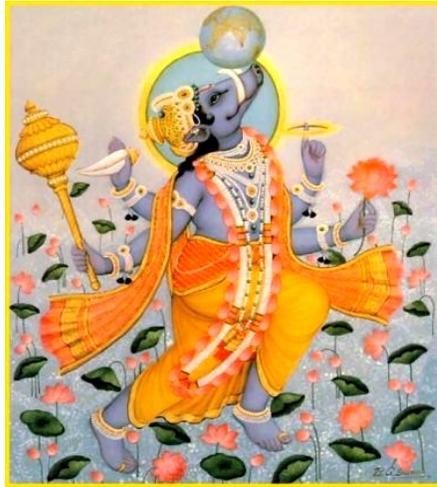
Since this influence behind the initial expansion is seen as the very origin of space, the Goddess Bhuvaneshwari represents the space aspect, just as Kaali represents time. In fact, the name Bhuvaneshwari itself translates to ‘Universe Goddess’, with the Universe itself seen as the body of the Goddess.

Bhuvaneshwari is also portrayed as Maha-Maya, owing to the fact that She, as space, forms the very fabric on which the Absolute Paramatma acts in the universe as various living and non-living things.

### C. Varaha Avatara

Just as Narasimha Avatara represents time, Varaha Avatara represents space. In this form, the Lord rescues the Earth from the Asura Hiranyaksha. To understand the implications of this mythology, we must understand the nature of Asuras.

Asuras are usually seen as the arch-enemies of the Gods Devas, and the King of Devas Indra is often seen at war with the Asura Vritra (translated as 'restraint'). The natural tendency of Devas is to expand. This is seen by their preceptor, Brihaspati, whose name is derived from the root 'Brah', translating to expand or big. On the contrary, Asuras, dominated by Tamasa Guna, have a natural tendency of contraction and descending to self-destruction.



Thus, the Asura Hiranyaksha, whose objective was to bring Earth down to self destruction and anarchy (symbolized by the turbulent waters where the Asura lived) was slain by Varaha, rescuing the Earth (symbolism for the entire universe) and putting it back on the path of expansion.

On account of Varaha rescuing the Earth and symbolizing space, He is known as 'Kshetra Paalaka' corresponding to Kshetrapala aspect of Shiva.

### D. The Lord's Shankha

The concept of space is seen as the Lord's Shankha in His left hand. The Shankha is a sea instrument, where air blown into a narrow end resonates through the pathway and creates a firm sound at the outset. In symbolism, the Shankha, with the pathway from the narrow end to the wide end represents a waisted hyperbolic geometry, a positive curvature deSitter geometry, representing the universe expansion [4].

While the very expanding nature of the path symbolizes dark energy, the darkness within represents dark matter, and the resonations finally resulting in the initial air blown transforming into a full fledged sound represents the formation of matter and radiation.

## Information

### A. Quantum Mechanics and Existence

While for a very long time, scientists were complacent of the precise clockwork universe nature of Newtonian Mechanics, the carpet on which such thoughts were standing was pulled forcefully from under their legs with the advent of Quantum Mechanics. It brought in uncertainty, probability and the notion that the universe as we know it, both matter and energy, may owe its existence to something even more fundamental: information.

After phenomenal observations such as the double slit experiment, famous thought experiments such as the Schrodinger's Cat and numerous debates such as the ones between Bohr and Einstein, scientists have formulated the principles of quantum mechanics, at the core of which lies the concept known as a 'wavefunction'.

A quantum wavefunction, represented by  $\psi$  is essentially a distribution along space and time, from which the state of a given system at any point in space and any instant in time can be deduced [5]. Viewed in terms of probabilities, the wavefunction is an indicator of the existence of an entity (matter and force carrying particles, for instance), within the framework of space and time. In other words, wavefunction corresponds to the fundamental property that is information: information about existence.

It is this information that leads to various states of energies and vibrations, resulting through various fundamental forces to matter as we know it in the atomic world. In fact, various scientists, including Lloyd, have proposed a 'Computational Universe' model of the world, where the equivalence between information and matter is the bedrock of the model [4].

Thus Einstein's MAXIM-X in a nutshell captures the inter-relationship between the three fundamental entities of the universe – space, time and information.

### B. Jnana Shakti: Somaskanda

In Indian Spirituality, the fundamental information of the universe is seen as the power of Wisdom, termed Kriya Shakti, and represented by the deity Skanda or Murugan or Subrahmanya. In essence, Subrahmanya represents the union of Shiva and Shakti, His parents.

Shiva Tattva represents the concept termed 'Prakaasha', which is pure existence, without any attributes. For example, in a simple statement "Fruit is tasty", one finds that the word "fruit" is the noun, representing matter in its materialized form. The word "tasty" refers to a description of the fruit, or in other words, its attribute. However the word "is" simply says the fruit exists, without talking about its attributes. This pure existence is the essence of Shiva Tattva.

Shakti Tattva represents the concept of 'Vimarsha', which represents the attributes of existence. In the above example, the word "tasty" would correspond to Shakti Tattva. Just as a rose cannot be separated from its smell, or a lamp from its light, Shiva and Shakti are inseparable and essentially one.

The union of Shiva and Shakti Tattva – of existence and its attributes – gives birth to the concept of information – Skanda. The combined form of Shiva, Shakti and Skanda is referred to as Somaskanda. This union assumes three modes – the passive Tamasa, the active Rajasa and the pure Sattva. These three

modes of Skanda as information combine together to form a single wavefunction pervading the entire universe – known as the Pranava ‘Om’. This Om is represented by the God Vinayaka.



Skanda is bright and resplendent, representing the height of knowledge, wisdom and information. This is seen in mythological reference to Skanda as Swaminatha, where He explains the meaning of the Pranava to His Father Shiva.

### C. The Lord’s Thirunaamam and Rama-Krishna-Kalki Avataras

As described in the Lalitha Sahasranama as Trilochana, Trinayana and Triambaka, the Universal Mother is seen with three eyes. The right eyes, representing Surya is of the nature of the sun, denoting Shiva Tattva, while the left eye representing Chandra, is of the nature of the moon, denoting Shakti Tattva.

Among Avataras, Shiva Tattva is Raama. In Tyagaraja’s masterpiece ‘Evarani’, he explains that, for the Narayana Ashtakshari Mantra ‘Om Namō Naaraayanaaya’, “Raa” is the most important Akshara. Of the Shiva Panchakshari ‘Om Namah Shivaaya’, the Jeeva Akshara is “Mah”. Combining these two gives Raamah. Apart from Vishnu Amsa (of which Rama is an Avatara), aspect of Shiva is seen. It is Shiva who shines radiantly as Prakasha, without a second. This corresponds to Raama’s fondness of the number ‘One’ (Eka-Patni).

Correspondingly Shakti Tattva is seen as Krishna. A particular form of Krishna worship is Gopalasundari, with Krishna (Vishnu) and Devi (Lalitha) seen as the right and left halves of the deity. In this and many traditions, Krishna is said to represent Devi or Shakti. Just as in contrast to the one Prakasha Shiva, Shakti as Vimarsha manifests in multitudes of forms, Krishna too exhibits multitudes of forms and roles. The Bhagavad Gita is the best text on the reflection of the Self (Aatma), highlighting Krishna’s role as Vimarsha Shakti.

The third eye, between the eyebrows (Ajna Chakra) is of the nature of fire and denotes the union of Shiva and Shakti as Skanda. In Lord Venkatesha, one sees this eye decorated as the Thirunaamam (Oordhva Pundra) of the Lord, and the resemblance of this Thirunaamam with the Vel (spear), Skanda’s chief weapon, is uncanny. This third eye inherits the powers of the two eyes, and together these denote

the power of information, which transcends space and time, and is limited only by concept.



While space and time are seen manifest as Varaha and Narasimha Avataras, information is the yet-to-manifest Kalki Avatara, inheriting properties of Rama and Krishna. It is believed that the steady decline of righteousness, morality and degradation of wisdom and knowledge in the Kali Yuga will be brought to an end with the advent of Kalki.

## Conclusion

Building on some of the most phenomenal theories and observations of science, this article probes deep into the nature of the three fundamental entities of the universe: space, time and information. Through a series of implications and inferences involving Indian Spirituality, one sees these entities in the three Shaktis of Iccha, Jnana and Kriya, as well as in the Avataras of Varaha, Narasimha and Rama-Krishna-Kalki. Importantly, one sees these three entities as the three 'toys' – Shankha, Chakra and Thirunaamam of the Lord Venkatesha, who is the Universal Mother Herself as the Kali-Yuga salvation yielding form of Baalaa.

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