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### The ways of future correspondence and harmony: Intertwining Mind and Meditation in the Microcosm & Machines and Mathematics in the Macrocosm

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#### Abstract:

All of our existence is an interplay of the two worlds - the microcosm and the macrocosm. The microcosm determines our internal world, mostly governed by mind and the deep or intrinsic parameters that govern our mind. The macrocosm determines our external world, mostly governed by the external environment as determined by the parameters of sciences and its language, which is the language of analytics and computation i.e., mathematics. The present article makes an attempt to initiate an understanding of their possible overlaps that may determine an 'emerging new science' integrating the two worlds i.e., scientific pursuits at a particular level of knowledge, with pursuits and inputs drawn from other levels such as deep culture, deep philosophy, and even the normative sciences like psychology and bio-anthropology, which can extend up to 'deep ecological' concerns having moral, ethical, and spiritual dimensions.

**Keywords:** microcosm, macrocosm, non-local universe, EPR paradox, non-duality, *advait*

#### FOREWORD

*'Agni, who has encompassed everything - all gods, and it is like the felly, a dynamic circuit encompassing the spokes of a wheel of change and evolution.'*

Rig Veda: 5th Mandala: 13.6

*'Returning is the motion of the Tao; going far is returning.'*

Lao Tzu in 'Tao Te Ching'

*‘The modern physicist experiences the world through an extreme specialization of the rational mind; the mystic through an extreme specialization of the intuitive mind.....to paraphrase an old Chinese saying, mystics understand the roots of the Tao but not its branches; scientists understand its branches but not its roots. Science does not need mysticism and mysticism does not need science; but men and women need both’*

Fritjof Capra in ‘Epilogue: The Tao of Physics’

## PRELUDE

There are the two worlds, the microcosm and the macrocosm. And all of our existence is an interplay of the two worlds. The microcosm determines our internal world, mostly governed by mind and the deep or intrinsic parameters that govern our mind. The macrocosm determines our external world, mostly governed by the external environment as determined by the parameters of sciences and its language, which is the language of analytics and computation i.e., mathematics. However, in most cases, the two worlds are incompatible and much of the conflict and misunderstanding that we have in our lives and in this world is due to the gaps, the large swings or the large amplitudes between our two worlds, the inner and the outer worlds. The two worlds and their relationships are evident in the following words:

*“There are two worlds, the microcosm, and the macrocosm, the internal and the external. We get truth from both of these by means of experience. The truth gathered from internal experience is psychology, metaphysics, and religion; from external experience, the physical sciences.*

*Now a perfect truth should be in harmony with experiences in both these worlds. The microcosm must bear testimony to the macrocosm, and the macrocosm to the microcosm; physical truth must have its counterpart in the internal world, and the internal world must have its verification outside. Yet, as a rule, we find that many of these truths are in conflict.*

*At one period of the world's history, the internals become supreme, and they begin to fight the externals. At the present time the externals, the physicists, have become supreme, and they have put down many claims of psychologists and metaphysicians.”*

Swami Vivekananda

COSMOLOGY

However, there are also some intervening times or periods of transition, when the two worlds have sent ripples to each other minimizing the conflict between themselves and establishing a dialogue. Perhaps, with the advent of 20th century, we may find some indicators of these ripples, and these are probably growing strong as the external world features are growing strong enough to trace back the depths of the internals.

In the present article, the two ripples are briefly discussed. One is from the world of latest sciences that is governing the current material growth of humanity. Much of that comes from the advent of machine driven computation sciences and the new Physics called the Quantum

Sciences. And much of that has occurred with the progress of the western civilization. The other side is an attempt to retrace the wisdom of the archaic Orient. And they are available from the re-interpretation of constructs of ancient Vedic cosmology explaining our inner growth and evolutionary spirituality in relationship with the cosmos.

In other words,

- The first represents the macrocosm, the external world of ours mostly governed by the controls of machines, and the communications that represent the material sciences behind the operation of these machines, and the language of science, i.e., the system of mathematics and its derivative i.e., computational sciences that govern the machine learning processes. These advents in the external world have led to higher capacities of our outer communications. We may term this as *bahir-samyoga* for the sake of the present article, and these communication systems have now advanced further to very large integrated systems of circuit sciences (VLSI) governing interaction between worldwide web and localized nodes of information networks. This is the latest in communication technology governed further by advances in machine intelligence called AI.
- The second represents the microcosm, the internal world of ours. And these internal networks are mostly governed by the control of the human mind through a system of inner control systems which is *Yoga*. In this case, the nature of communications that emanate from the inner neural and psychological configurations (*nadis* and networks) are based on refinements or improvements of hormonal and neuro-physiological transmutations (*nadi suddhi*). On the whole, it leads to a gradation of higher capacities of inner communications, which may be *antara-samyoga* in the context of the present article. And the deep embedded science of the parameters is represented by a system of evolutionary construct called the *Samkhya* philosophy, which is a strand or hierarchy of elements of design based on 24 principles of nature (*prakriti*) and a governing but free conscious or sentient being behind it (*purusha*). And the inter-related web of *nadis*, that govern the biological system of inner evolution is called the *tantras*.

### **The Current Inter-Twining and The Overlap**

Now we may be in at a certain time in human history and progress, where a time of cross-over of the two has perhaps come. In other words, the systems world of external communications (*bahir-samyoga*) and the systems world of inner communication (*antara-samyoga*) are about to become reciprocal and complementary to each other. And that complementarity is only evident on the mirror of human consciousness, which determines both the external and the internal world. The present article makes a simple attempt to initiate an understanding of these possible overlaps that may determine an ‘emerging new science’ integrating the two worlds.

Currently, both the worlds are drifting and expanding; and very interestingly, the two drifts are mirroring each other.

- On the one hand, the analytical science of the outer world, governed mainly by advent of machines and machine learning by virtue of large computation abilities and deep mathematics is expanding and drifting from a reductionist and linear programming-driven framework to a larger whole that exhibits features of non-linearity and complexity.
- On the other hand, the intuitive science of our inner world, is increasingly seen as a trickle-down from its older paradigm of a beyond-the-world transcendental state or level to a more inclusive, all-encompassing immanence world of ‘being and becoming’.
- And as a result, the two drifts and expansion now appear to be symmetrical and mirroring each other:
  - a) the unfolding of the multiplicity, where the various microcosms are heading towards that unity or the macrocosm, and
  - b) the enfolding of the macrocosm or a vast unity of the cosmos which is becoming or trickling down to the multiplicity of the many and many microcosms
  - c) In effect, a hierarchy as a two-way ladder is evident.

At this point, let us begin with a discussion with the external world (Part A). Then we shall take up events in the internal world (Part B). Finally, the article will conclude with a note that may be just a beginning to understand their overlaps and possibilities of complete interpenetration.

### **Part A: The Theory of Non-Locality – Its Current Evolution**

In the last 100 years of physics, the idea of non-locality has emerged to be the stronger. The older order i.e., the Cartesian and Newtonian world of reductionism still exists, but it is taking a back seat. These shifts may be understood by briefly reviewing a sequence of events that underscores the advent of the latest in physics. We call that Quantum and Relativistic Physics:

1. In May 1935, Sir Albert Einstein and two of his colleagues, Boris Podolsky and Nathan Rosen (acronym EPR) published the first description of a reality that is non-local (meaning traveling faster than the speed of light) as something unbelievable. Einstein called this ‘spooky action’ and this publication was eventually called the EPR paradox. It includes two major enigmas:
  - The collapse of the wave function as interpreted through the wave equation of Erwin Schrödinger

- A probabilistic notion that every part of a quantum system responds instantaneously to a stimulus affecting any other part of a system. They suggest instantaneous connection with the universe as a whole.
2. The EPR experiment inspired other areas of research like polarization of light<sup>1</sup> seen from a quantum viewpoint. These emissions suggested information transfer in opposite directions to points far apart. Whether such transfer actually takes place at a speed exceeding that of light is another question. Such questions were raised by the classical physicist by virtue of the interpretation in favour of the Newtonian world. Today, we know it as the 'Copenhagen interpretation' (initiated in the 1920s, but expanded by the arguments between Werner Heisenberg and Niels Bohr in the 1950s).
  3. Two later works emerged as a counter-response to the Copenhagen interpretation. One was the idea of the 'Implicate order' by physicist David Bohm (London, U.K.) in the 1950s and the other was by John Bell at CERN (European Center for Particle and Nuclear Physics, Switzerland) in the 1960s. Bohm proposed the 'Scattered-Matrix' theory with the 'Enfolding order' of the Universal becoming to all things and their interconnectedness in this universe. John Bell, with his 'Bell's Theorem', proposed to take the notion of 'non-locality' further. But all these were theories. Classical physicists still played the dominating role governing the principles of local determinism and reductionism.
  4. In the 1980s, a team of physicists namely Alain Aspect and his colleagues (in Paris) for the first time experimentally confirmed the EPR enigma and posed new avenues to review the Copenhagen interpretation of Schrödinger.
  5. Then in the early 1990s, John Cramer at the University of Washington, Seattle, pointed out a unique thing implied in Schrödinger's wave equation. Cramer reviewed the equation and explained a bi-polarity meaning *a conjugate of opposites*.

His wave equation is based on the simple idea of complex numbers which is:

$$Y = A + Bi$$

and Y here stands for a complex number

$$\text{If } Y = A + B \text{ then } Y*Y = (A + B)*(A + B)$$

$$\text{In case of complex numbers, we know that } Y*Y = (A + Bi)*(A - Bi)$$

In other words, this complex conjugate form implied both backward and forward linkages of the B factor, which stands for *Time* in the wave equation.

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<sup>1</sup> It is a property of light giving it a kind of orientation vertically and horizontally across in the lines of motion.

So, implicitly or explicitly, the use and application of the wave equation involves backward and forward linkages in time (Gribbin, 1995)<sup>2</sup> in any quantum calculation or experiments. Cramer's deliberations imply that a wave function has a bi-polarity of backward and forward linkages of time. Backward linkage of time takes creation backward to its roots, its origin determining the unfolding order, as if the statistical dendrogram (a vast data distribution in a tree form) is tracing its seed over backward linkages in time. If backward linkage is established, then forward linkages of time, on the contrary, take us to future in the enfolding order. This is what David Bohm had proposed two decades back. The two linkages are however juxtaposed in the above equation.

6. Finally, in 2022, the most important event occurred in favor of transcending 'The Copenhagen Interpretation'. It is the 2022 Nobel Prize in Physics. The Nobel Prize in Physics 2022 was awarded jointly to Alain Aspect, John F. Clauser and Anton Zeilinger 'for experiments with entangled photons, establishing the violation of Bell inequalities and pioneering quantum information science'.
7. Now as per latest in Quantum Sciences, we know that the Universe is deeply 'non-local' and 'interconnected' enfolding within its folds the many. It is like a Matrix. In the reverse order, the unfolding of many happens. One such is human evolution itself to mirror the understanding. The twin is best understood as the Q-entanglement or as an interpenetration of the two i.e., 'A whole or a totality containing all the parts' where 'All the parts individually contain properties that represent the whole'.

The review shows that the latest in science has come close to what was eternally contained in Indian spirituality. We are not saying that this is equal to that. But what we imply is that the patterns (iterations in the plan) in the macrocosm perfectly correspond to that in the microcosm. The match point is precisely an intertwined reality where 'All things essentially contain in themselves properties of the Whole' and 'The Whole contains the seed to formulate and express all'. The ancient Isha Upanishad Verse 6 explains that as a body of intertwined realization.

**यस्तु सर्वाणि भूतान्यात्मन्येवानुपश्यति ।  
सर्वभूतेषु चात्मानं ततो न विजुगुप्सते ॥ ६ ॥**

*(Translation: But he who sees everywhere the Self in all existences and all existences in the Self, shrinks not thereafter from aught)*

Thus, the advancement of science in the macrocosm has brought us to the other side, the science of the internal world. And we shall see in the next part how a counter response or mirroring is also evident in the other side.

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<sup>2</sup> The idea comes from Schrödinger's parable of two kittens – Dead or alive (1995) – readers may refer John Gribbin in 'Down to Earth', August 15, pg 29-36.

## Part B: The Meet and a Letter

After the great triumph on the World Stage at 1893 Columbian Exposition at Chicago, USA and with the closing of the Parliament of Religions on September 27, 1893, Swami Vivekananda had an invitation to the house of Elisha Gray, the noted inventor of electrical equipment<sup>3</sup> to meet some of the best scientific minds of America. It is interesting to see how a man of deep gnostic spirituality attracted scientists from a liberal and secular world!

Later, on September 28 and 29, 1893 Swami Vivekananda had gone to Highland Park<sup>4</sup>. Some of the important guests at Highland Park were the British physicist Sir William Thomson (also known as Lord Kelvin); the German scientist Herman Von Helmholtz; and the French delegate to the International Electrical Congress, Professor Edourd Hospitalier. Here the name of scientist and electrical expert Nichola Tesla was never heard, at least officially. But some researchers<sup>5</sup> suppose that he was there as evidence of further interaction emerged as presented later. Nikola Tesla, as we all know, was the inventor of the alternating current<sup>6</sup> generating machine, which was being demonstrated at the Chicago World Exposition, and one of the pioneering scientists of 19<sup>th</sup> century whose contribution also gave us wireless transmission, the Tesla Coil, and the first constructs of a world wide web (WWW) of communication. It is of great probability that Nikola Tesla had met the Swami at Chicago during and after the Fair, as both of them were centers of attraction as great speakers. But real interactions happened later and these were in New York City.

It was Swami Vivekananda, who was explaining Cosmology on the basis of three variables. First, **Prana**, a life-current constituting all dynamism and waves of action and reaction from small to large in this universe; second, **Akasha**, which is an all-pervading space from small to large; and third and the last, **Kalpa**, the single cycle of time representing a unitary cosmic creation and dissolution. Recalling Tesla's reaction to the invocation, Swami Vivekananda writes:

*"..... Our friend (Tesla) was charmed to hear about the Vedantic Prana and Akasha and the Kalpas, which, according to him, are the only theories modern science can entertain. Now both Akasha and Prana again, are produced from the Cosmic Mahat, the universal mind, the Brahma or Iswara. He (Tesla) thinks he can demonstrate mathematically that force and matter are reducible to potential energy. I am to go and see him next week, to get this new mathematical demonstration".*

Two constructs emerged from what they had shared:

1. First, a conceptual framework of the parallels of Vedanta and modern Science.

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<sup>3</sup> Life, Vol. 1, page 448, Udvodana, A publication of the ramaKrishna Mission, Kolkata.

<sup>4</sup> This was wealthy suburb on Lake Michigan, USA, about twenty miles north of Chicago.

<sup>5</sup> 'Swami Vivekananda in Chicago: new findings' by Asim Chowdhuri (Adwaita Ashram), pg 127.

<sup>6</sup> An alternating electric current (A.C) mode has replaced the direct current now. It is popularly known as the A.C. which varies in strength and it periodically reverses its direction. The frequency of an A.C. is the number of times the current passes through its zero value in the same direction in unit time.



2. Two, the plans of Tesla outlining his advent in the later years in pursuit of the holistic truth as implied by the framework.

Sister Nivedita<sup>7</sup> (earlier known as Margaret Noble), an Irish born lady and later an important disciple of Swami Vivekananda puts it in the following words:

*“.... Swamiji attacks the whole problem (while explaining Tesla) of the relation between force and matter, making at the same time a brief but ‘pregnant epitome’ of what he regards as significant, in Indian conception or lore about death. It is easy as one read this letter, to see how he has been thrilled by the congruity of ancient Indian thought with modern science”.*

### **The Evolving Hierarchy and Its Inner Orders**

It will be appropriate to review the rest of the letter. Swami Vivekananda was confident in what he was intending. His explanations were based on the Upanishadic descriptions of mind heading for meditation. These are features from the inner world, representing the unfolding of the microcosm through mind and meditation.

Meditation is a psychic depth where the soul of the person sojourns beyond the physical body (the *pinda*) and enters an inner (or the cosmic expanse – comparable to the *Brahmanda*). At times, the soul touches the transcendental unity beyond the cosmos and shines forever as the ‘one and only one’. This journey is the very foundation of Vedantic cosmology and also of Christian eschatology<sup>8</sup>. In the letter Swami Vivekananda further added:

*“...In that case, the Vedantic Cosmology will be placed on the surest of Foundations. I am working a good deal now, upon the Cosmology and eschatology of the Vedanta. I clearly see their perfect unison with modern Science, and that of the other will follow the elucidation of the one. I intend to write a work later on, in the form of questions and answers. The first chapter will be on Cosmology, showing the harmony between Vedantic Theories and modern science”.*

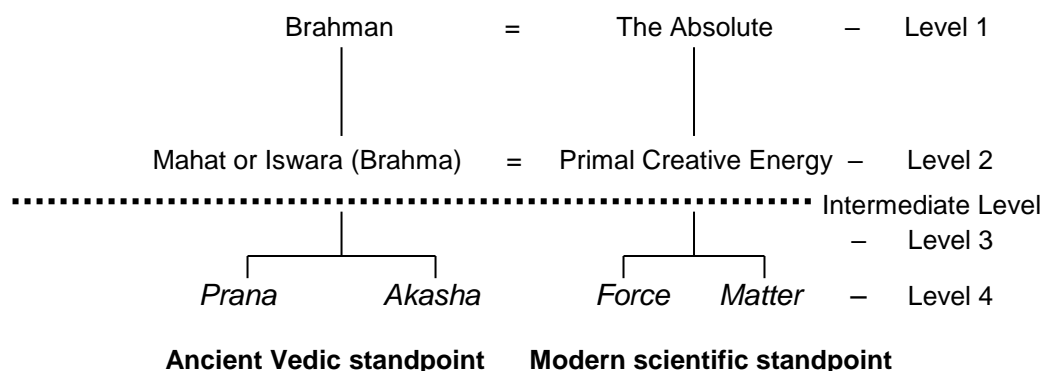
Swami Vivekananda had provided a conceptual framework by correlating the two explained in five levels and explaining the enfolding and the unfolding orders within the hierarchy of the whole.

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<sup>7</sup> From ‘Master as I saw Him’, in the Chapter on ‘Death and transmigration of souls’.

<sup>8</sup> Eschatology means the doctrine of the last things; according to Christianity – Death, Judgment, heaven and Hell. In other words, it is the fate of the soul.





**Figure 1: Constructs and analogy of between the inner and the outer world**  
[Composed and conceived by Swami Vivekananda]

Figure 1 has been interpreted as a hierarchy of both the resolution and differentiation of the two elemental variables, *Prana* and *Akasha*. The whole journey of the individual soul i.e. from level 4 to level 1 represents the entire ladder of evolution.

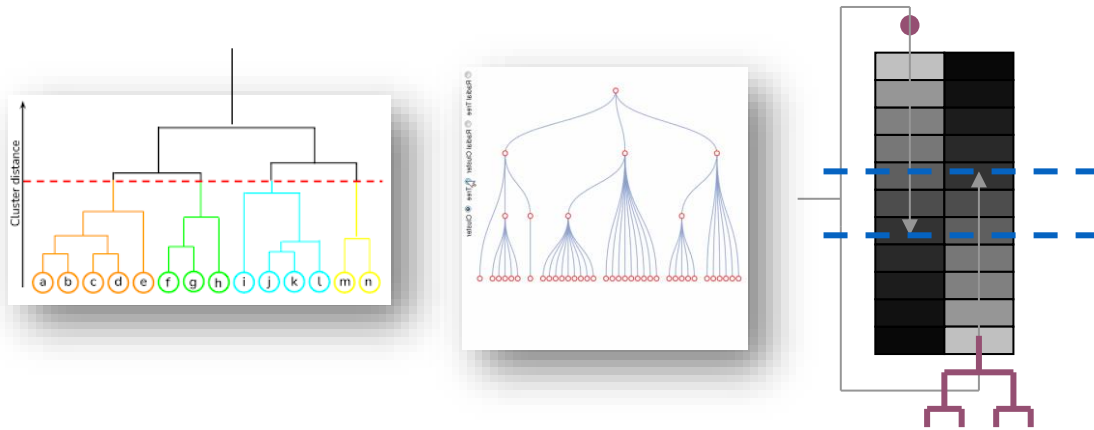
In the dualist (*dvaitic*) viewpoint, the soul passes from level 4 (solar or material sphere) to level 3 (lunar or mental sphere); thence to the intermediate level (electric or cosmic sphere); and then to level 2 (cosmic unitedness or *Hiranyagarbha* identified as *Brahma-loka*) and finally to the Absolute (the level 1 of an unchanging and transcendent unity beyond all levels).

The non-dualist (*advaitic*) viewpoint says that the soul neither comes nor goes, and all these levels are varying products of *Akasha* and *Prana*.

### Reconciliation Within the Hierarchy

The current framework is based on the *advaitic* viewpoint only. This monistic viewpoint says that the levels are visions, which arise in succession before the individual soul (*Jiva*), who neither goes nor comes, and in the same way this present vision gets projected or dissolved. The projection (*srishti* or creation) and dissolution (*pralaya*) must take place in the same order - only one means going backward and the other coming out.

In other words, the enfolding order is the ‘Seed form’ manifesting within itself the Tree that represents the becoming of the whole manifested universe in all its variety and multiplicity at various levels. The Seed is the condensed or unmanifest form or the *Avaktya*. In counter-response or as feedback, the unfolding order of each Seed form contained in the fruits of all the future Trees contain Seeds that contain properties of the original Tree. Thus, each later Seed can manifest as a ‘Tree Form’ by tracing the property of the original Seed.



**Figure 2: The seed (upper crown or Origin) and branches (lower ramifications) as a setup of indispensable iterations within the hierarchy (enfolding and unfolding order)**

[Composed and conceived by the author as abstracted from the Gita 15.1]

Thus, the two movements are reciprocal and complementary. They are called the *Chhandas* or the infinite Rhythms of truth (see Figure 2). It is explained in the Gita 15.1 as the Inverted Knowledge Tree, the symbolic Bodhi Tree, The *Ashwattha*.

- The *Chhandas* are the very Vedas that are heard over eternity. This is spirituality.
- Hence, they are also known as *Shrutis*. Tracing it back, as achieved by various Mahayogis, is a reciprocal part in recorded history. That is called *Smritis*. They lead to various religious movements. But *Shrutis* always precedes *Smritis*. Each involution or enfolding order precedes the evolution at our end, the unfolding of our Self to be the Self of the universe. *Shrutis* are always no. 1 to which *Smritis* communicate as no. 2.
- The two together, makes the equation complete. It may be called Complete Concept of Religion. If both are present, the religion becomes eternal or *Sanatana*.

Now let us get back to the two movements which are equivalent to the Schrödinger's wave equation as discussed before. Cramer reviewed the equation and explained the bi-polarity meaning *a conjugate of opposites that contain both the implicate and explicate orders* as designed by physicist David Bohm.

Schrödinger's wave equation is based on the simple idea of complex numbers which is:

$$Y = A + Bi$$

and here Y here stands for a complex number:

$$\text{If } Y = A + B \text{ then } Y * Y = (A + B) * (A + B)$$

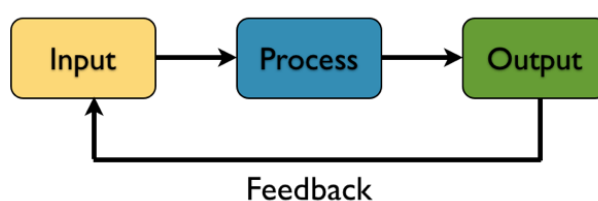
$$\text{In case of complex numbers, we know that } Y * Y = (A + Bi) * (A - Bi)$$

Or,

$$Y = (\text{Seed in later Tree tracing back first Seed}) * (\text{First Seed manifesting as Trees})$$

Thus, a two-way ladder of involution containing the enfolding order from the other side of infinity and a counter evolutionary sequence containing the unfolding order from this side or our side of infinity is evident. The network, feedback loop within the network, and the returns to scale in the hierarchy from Many to ONE and ONE to many is constantly iterating in the inner hierarchy of the ladder. In Indian epistemic knowledge, this cyclic iteration is called the *Mandala*.

- Thus, in the language of external sciences, it is now known as Quantum Entanglement that explains the non-locality across galaxies in the universal becoming of systems.
- In the language of internal sciences, it is the interpenetration of *Anulama (Unmana)* and *Viloma (Samana)* where the unit Self of a particular *Yogi* (among many and many *yogis*) is in communion with the Master Self of the Universe as one orchestrated system of identity. *A Yogi is just one wave among many and many waves in the sea of Yoga.*
- This deeper connect and controls (*Yoga*) between the two ends, the linkages and communication between the two (*Samyoga*), and the constant iteration of the turning around is best explained in the language of Cybernetics today.
- Cybernetics therefore has the immense possibility of holding an inner key to bridge the two worlds (see Figure 3). It assures self-automation within the enfolding of any system, so that the system contains parts, where each part reflects the system itself. This may be the beginning of an understanding to reach the foundation of the sentient self-generation in the universe, from Large to Small. In Indian epistemic systems it is known as *Chiti*, *Chaitanya* or *Chaitya*, i.e., the self-contained-unit of consciousness.



**Figure 3: The essence of a Cybernetic System**

The network of Causality and Retro-causality (Progression, Feedback, Nonlinearity and Self-Automation)  
[Composed and conceived by Norbert Wiener, MIT]

- The ancient Rig Veda earmarks it as the all-pervading Matrix of all, the *Chit-Shakti* 7.68.8 - यावद्व्यामपिन्वतमपो न स्तर्यं विच्छक्त्यश्विना शचीभिः ॥ But more than the *Vaidiki* system, the *Tantriki* system has expanded in depth on the *Shakti* part and her sutras, the threads of the cosmos. The *Vaidiki* and its ends (*Vedanta*) have mostly touched the Absolute part, The *Mahat* or *Mahato-mahoriyan*.

- But now we need a two-way dialogue between the two, between the Origin, the Absolute and the Original power, the *Chit-Shakti* to best explain the Cybernetics of Universal being and becoming.

## WAY FORWARD

The languages are different. But the complementarities between the two worlds, mirroring each other as the two worlds, the macrocosm and the microcosm, is a matter of interpenetration. What is evident in the inner laboratory of mind and meditation garnered by our rishis is now increasingly visible in the external laboratory of machines and mathematics. This is indeed a great turning point in human history as 2022 Nobel Prize in Physics has closely echoed the pattern contained in the ancient wisdom, which says:

सर्वभूतस्थमात्मानं सर्वभूतानि चात्मनि ।  
ईक्षते योगयुक्तात्मा सर्वत्र समदर्शनः ॥ 6.29॥

The above sutra is quoted from the ancient scripture called the Gita where Sri Krishna and Arjuna, were engaged in a highest discourse amidst the battlefield of life:

*“Oh Arjuna ! The Mahayogis, uniting their consciousness with the all-pervading divine consciousness, see with equal eye and empathy, all living beings unfolding and remaining in that One being and that One Being containing and enfolding within all living beings.”*

In the words of Evolutionary philosopher and Mahayogi Sri Aurobindo in our own times, the same can be reiterated as:

*“Nothing to the Supramental sense is really finite: it is founded on a feeling of all in each and of each in all”*

*(Quoted from - Synthesis of Yoga)*

The present article forwards the need to redraw complementarities between the two sides, i.e., scientific pursuits at a particular level of knowledge, with pursuits and inputs drawn from other levels such as deep culture, deep philosophy, and even the normative sciences like psychology and bio-anthropology, which can extend up to ‘deep ecological’ concerns having moral, ethical, and ‘spiritual’ dimensions. We have earmarked these two as the two worlds, the macrocosm and the microcosm. In doing so, we have reached a double-laddered hierarchy, an intertwined system of response, feedback to response and cyclic iterations over time, which is evolution itself. The key objective of this deliberation as underscored herewith is to set indispensable iterations within the hierarchy as proposed in this article. The need of the hour is to evolve a holistic framework of an emerging “new science of complementarities” transcending the preceding limitations and myopia of an ‘Either-Or dialectics of reductionism’ as it was

governed by Cartesian classical approaches of the yesteryears. I thus end with a great hope contained in the great saying of a master scientist:

*“It is probably true quite generally that in the history of human thinking the most fruitful developments frequently take place at those points where two different lines of thought meet.”*

Werner Heisenberg

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### **Brief Profile of the Author:**

**Dr. Joy Sen** is a Professor of the Department of Architecture and Regional Planning, Indian Institute of Technology, Kharagpur, West Bengal, India and Former Head (June 2017 - July 2020). Prior to that, he had been the former Head of Ranbir and Chitra Gupta School of Infrastructure and Design, IIT Kharagpur (Aug 2014 – June 2017). His areas of research are Community and Regional Planning Analyses & Programming and Architecture and Planning related Heritage Studies and Documentation.

He has a long working experience with the various Environmental Design programs under DFID Government of the United Kingdom (1995-96) and ISU-UNDP program (1987-89) and IR3S (2011-12) in the University of Tokyo, Japan. He is currently associated with the two mega projects sponsored by MHRD Govt. of India, i.e., the SandHI - Science and Heritage mega initiative (acronym SandHI) and the Future of Cities. He has authored seven books on Indian Heritage, Iconographic Documentation and a Text book on Sustainable Planning in India.

### **Statements and Declaration:**

The present article is extracted from Annexures 4 and 5 of a Book by the Author entitled ‘Sustainable Urban Planning’ - published by THE ENERGY RESEARCH INSTITUTE (TERI), Government of India id: <https://bookstore.teri.res.in/books/9788179933244> (2012), and later developed in last chapter of GLOBAL HISTORY OF INDIAN ARCHITECTURE, Copal Publishing, New Delhi (2015). But the key concepts are originally extracted from the master book entitled SANTA PRASANGA (2004), which was further deliberated as a CONCEPT OF COMPLETE RELIGION (2007) by the author in form of another book.

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