Setting the Agenda for Science of Information

THE TWENTIETH CONFERENCE ON TOWARD A SCIENCE OF CONSCIOUSNESS
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Science: Deals with Nature

Spirituality: Deals with *nature* of consciousness

Mysticism: Engagement with consciousness
Science at present stage deals with only Local Players

1. Matter
2. Energy
3. Space
4. Time
5. Information (at local level)
The Closed Box of Science in Present Phase

Where is Information in the scheme?

Any new information is supposed to be the language consciousness speaks.
Communication between inside and outside box

1. Consciousness stuff (?)

2. Interstitial particle (?)

3. Subtle energy (?) (William Tiller)

4. Suggestion from De Broglie’s ‘pilot waves’ associated around each particle. The Velocity of individual oscillation in pilot wave is $>>c$

5. Communication between Electromagnetic radiation and Magnetoelectric radiation. Communication between electron and ‘magnon’

6. ? Deltron particle in Simulator Model of William Tiller

7. In order to strengthen the mainstream science, it would be preferable to call it information
What is Information?

1. The unit of communication
2. Information is that which reduces uncertainty (Shannon)
3. Unlike Consciousness, Information could be an Entity. Its location, content and context are addressable
4. Unlike any other known entity, Information could be independent of Energy Matter and measurable Space, Time
The Assumption
The Assumption

Accepting the subtlety of information and its distinctness from energy, the research agenda can be build up on an assumption that information has an existence, independent of matter/energy and space time, which is in nature beyond Planck’s scale!
Review of Literature
David Bohm distinguishes matter from mind only on the basis of explicate and implicate order! His Quantum Potential includes information!

Information is expected to be integral of d’Espagnat’s ‘Ultimate Reality” which is independent of, and posterior to mind-matter distinction. Why not information could also be traced to unus mundus of Carl Jung?

Since 1990, following John A. Wheeler’s persuasive argument to learn about the world by looking at it in term of information, effort has been made to find out the underlying relationship between quantum mechanics and information.

On its 125th anniversary, July 1st, 2005 issue of Science highlighted several questions for which we do not have any answer. One such important question is, “Do deeper Principles underlie quantum uncertainty and nonlocality?”

The subtlety of information has been recognized by Hawking and Penrose from the fact that information can pass through black hole, while light cannot!

Recently David Chalmers has pointed out information might be relevant in assessing the level of reality which is more fundamental to both mind and matter.
Multi-Revolution Theory

Revolution on Matter side

Revolution to join the both

Revolution on Mind side

Michael Lockwood

Roger Penrose

Colin McGinn
Quantum Mechanics is the Mount Everest of Material Science

No height to scale further except Exploring Information!
Quantum Void
‘Fountainhead’

Nest II

Nest III

Quantum Discontinuity
‘Sink’

The ‘Sink’ and ‘Fountainhead’ of Quantum Plane
Pentaune (Five in One) Model of Nature- Consciousness

Nest I   Classical domain of Nature

Nest II  Quantum domain of Nature

Nest III Sub-Quantum domain

Nest IV  Mother Nature

Nest V   Unconditional Cons. Consc.
Spiral Model of Nature’s Five Nests

- Classical Nature (I)
- Quantum Nature (II)
- Elementary Terrain (III)
- Unconditional Consciousness (V)
- Mother Nature (IV)
Basis of this Proposition

Perceived uncertainty in describing observer-dependent Reality
Uncertainty at the edge of the Universe

Uncertainty at the level of the Black hole

Heisenberg’s Uncertainty

Uncertainty in Nest IV

Uncertainty in Nest III

Uncertainty in Nest II

Uncertainty is Measurable

It can also be Perceived, Conceived and Experienced
Pentaune (Five in One) Model of Nature-Consciousness
How ‘Free Will’ comes on the Wheel!
Bernard J. Baars

In the Theatre of Consciousness: The workspace of the Mind

Primacy of Information
“Information is a prime commodity, and when it is used in biological theorizing it is granted a kind of atomistic autonomy as it moves from place to place, is gathered, stored, imprinted, and translated.”

“Quantum Mechanics is the complete and ultimate truth about physical universe....I am inclined to believe that at some point between the atom and the human brain, it (Q.M.) not only may but must break down”. (1986)

“....the linear formalism of standard quantum mechanics may break down at some stage between the level of the atom and that of human consciousness”. (2005)
Determinism Beneath Quantum Mechanics

Quo vadis Quantum Mechanics? (2005), pp. 99-111
Quantum Physics as a Science of Information

Quo Vadis Quantum Mechanics? (2005), pp. 47-61
"In the beginning was the Word, and the Word was with God, and the Word was God."

New Testament, John 1:1
In *Mimamsa*, one out of six Philosophical schools prevalent in *Darshan*, it has been said that matter has come out of Information.

\{\textit{Padartha} = \textit{Pada} \text{(word)} + \textit{Artha} \text{(matter)}\}
I am a Voice without a Form

... thoughts of Swami Vivekananda
A Radical View of Information
On its Nature and Science

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Abstract
This paper focuses on a possible fundamental nature and character of information. It develops arguments on the primacy of information in the context of its relationship with space, time and energy, self, memes and genes. For investigating these relationships seven tentative postulates have been made which merit further deliberation. Information-split phenomenon may be the connection between science confined to locality and science of nonlocal domain.

The Background
If one browses through internet, using key phrase like ‘what is information’, one comes across numerous websites, which work with definition of information limited to message, signal, code, data, facts, text, instruction, lore, symbols, concept, construct, knowledge, wisdom etc. This paper takes the view that almost all of these are nothing but space time construct of information and the information itself is something else!

It may be said that the message in this paper is nothing but a moving space time construct of information author’s mind has been processing. During the act of reading the article, this moving space time construct stimulates reader’s mind to catch and fix the same information. If there is concurrence, the paper becomes understandable. If otherwise, the paper is rejected as ‘not sensible’.

The notion that information is inextricably related to mind could be traced to the time of Greek Philosophers Socrates, Plato and Aristotle. This could also be noted across the religious sects particularly in their respective mystical traditions; the oldest document of such scriptures is Upanishad.

The science of information, however, in its present form is positivistic and accommodates only the measurable component of information. The notion was formalised since Claude E. Shannon’s classic paper, A Mathematical theory of communication appeared in Bell system Technical Journal in 1948. The Information Theory is based on probability theory and statistics. Quantification of information is used in entropy in random variable and the amount of information in common between two random variables. One of the most important and direct application of information theory is coding theory. The same measurable component of information is now being harnessed in quantum information theory.

The hard core physicists, information scientists and mathematicians, although, do not acknowledge any trace of subjectivity in science, the fact that information has a subjective and an objective/measurable facets, has been acknowledged recently in the works of scientists like David Bohm (in his ontological interpretation of quantum mechanics), Robert Jahn and Basie Hilley and cognitive scientists like Bernard J. Baars (in his Global Workspace Theory) and Johnjoe McFadden (in his Conscious electromagnetic field theory), to name some prominent few.

That ‘self’ can handle information has been noted by modern phenomenologists, many amongst them consider that the mechanism in both subjective and objective phenomenology is directed by information. The issue of ‘View from within’, First-person approaches to the study of Consciousness has been dealt in depth in two joint issues of Journal of Consciousness Studies. That amplification of phenomenal information could be a mechanism towards conscious experience has been articulately by Liane Cabora.

Common sense experience tells us that information can not be generated by inanimate objects which at best can store, or activate information. Information is generated by a living entity and metaphysically this generation of information is linked with operation of life-principle. In a recently published essay, A. Grandpierre concludes, “living organisms have access to an inexhaustible source of information, universally, in the same manner as the physical objects have an access to information content present in the Hamilton principle or to the action principle.”...

“Universally available information source is the life-principle.”

Information, although, seems to be more powerful than energy in various live situations, its distinct relation with energy is yet to be settled in what we call ‘hard science’. The question how information is related to energy has bothered numerous front runner scientists from the time of James Clerk Maxwell and there is no answer yet

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“Life’s origin may only be explained through a study of its unique management of information. … Our work suggests that the answer will come from taking information seriously as a physical agency, with its own dynamics and causal relationships existing alongside those of the matter that embodies it.”

- Paul Davies
  in The Guardian, 13 Jan, 2013
God Particle to Consciousness: Life-science, Neuroscience and Nonlocal Science Hold the Key

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Abstract

The scientists are nearer to God Particle. How far the ‘God’ of science, meant Consciousness, is from God Particle? The speculative response to this relevant question has given birth to this paper. From Higgs-Boson, the Mother Matter, to consciousness we have several milestones to understand. e.g. dark matter, dark energy, their source and a big picture of information. Does all this have anything to do with the occasion of origin of life-form? Does it have any repercussion on cell biology, neuroscience and human behavior? A preliminary sketch has been developed in the course of this paper and a time frame has been stated as required for rationalization of consciousness by the mind of Homo sapiens.

1. God Particle

At the CERN Laboratory on Fourth of July, 2012, the scientists came nearer to the origin of matter with four point nine-sigma certainty. “We have observed a new boson with a mass of $125.3 \pm 0.6 \text{ GeV}$ at 4.9 sigma significance.” The wave length of the field of Higgs-Boson is non-zero vacuum. The assumption is that any wave/energy when comes under its field, practically in contact with it, acquires mass and therefore gains stability. It would be true even for neutrino which otherwise is without mass. How they acquire mass or why they acquire mass cannot be explained at this stage. However, Higgs-Boson seems to be the starting point of acquisition of mass. Following this, what is left to be known for the scientists is how
Information Holograph
The Structure, the Source and its Operation

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ABSTRACT
Does the Whole communicate with trillions and trillions of miniature wholes? If so, it is how and why? These questions have given birth to this conceptual paper where First person’s experiential realm has been expressed in Third Person’s perspectives. The construction is expected to be compelling to those who are familiar with the limits of present science, affirmatively looking forward to extending science beyond Planck’s scale and beyond the boundary of the defined system and are mentally interested in investigation of the Source-field in whatever name one might call it. The central theme of the paper is Information Holograph by means of which the nonlocal and local players remain connected in the cosmos. The paper proposes a structural geometry of information in both inactive and active states and suggests that information could be retrieved by information-carrying, “be-able” quantum particle/wave across ZPE fields. The paper draws a distinction between Quantum Hologram and Information Hologram and also between quantum entanglement and information entanglement. The emphasis is on an extraordinary constellation of neutrinos, photons, phonons and conforms with self-consciousness in the context of healing. The ultimate Source for science has been suggested, for the present state of human intelligence, to be the Source of the multiverse, the Essence of The Multiverse (EM), of which ZPE is an outside-in picture (ZPE ZE EM) across the boundary of the universe.

Key Words: Information Holograph, Z.P.E., Source of Multiverse, Constellation of Neutrino, Photon, Phonon and Conform
around consciousness/self.

INTRODUCTION
Philosophy is said to be the Mother of all Sciences. Then why is there no progress of science beyond Relativity and Quantum Physics? Are we going through also a downturn of philosophical ideas? Or, has there been dearth of philosophers who can formulate research questions and research hypotheses for further development of science? However, the idea that everything has been created from the void as propounded in the basic tenet of Buddhist’s philosophy and the scientific idea of Z.P.E. fields as the Source field have found concurrence at present. It has escaped notice of many of us that in the Pyramid Texts from Egypt (about 2000 BC), it is stated that real sensory world is an appearance, an emanation from a hidden realm beyond nothingness/void/death. There are ancient Indian Philosophy in Vedas and Upanishads where the human thoughts have gone beyond this void. In the opening invocation prefixed to Ishia Upanishad of Rig Veda, an ancient literature which has been systematically documented by evolved mankind more than 3000 years before the arrival of Christ on this earth, one can find this shloka.

"Om Purusaadah Purnamad
Purnamadat-Purnam-Idachyate
Purnashya Purnam-Aadayata
Purnam-Eva-Avasisyate"

In brief, it means that the whole remains always whole. One can take away any number of bits from the whole, it remains always whole and the bit is also whole! Note that the bit is not part or unit of the whole. The bit is also whole! This offers the underlying philosophy of a hologram.

The question is what constitutes this revered whole? We are familiar with frequently used phrase like “holistic” vision, “holistic” health, “holistic” living and “holistic” science etc. In 1980s British physicist David Bohm first brought the concept of holography in physics [1]. Ken Wilber from United States edited the book on holographic paradigm where one can see neuroscientist Karl Pribram’s pronouncement, “The brain is a hologram interpreting a holographic universe”. With Bohm’s, “It is not static. It is all holoflux” [2]. Recently the scientists working on memory have started accepting the view that memory storage inside the brain might have been done in a holographic manner. Scientists working on near-death experience have reported from their subjects/patients that many of them during the occasion of encountering death, at the end of the long dark tunnel had undergone a holographic review of the event history of life. Dennis Gabor was awarded a Nobel Prize in Physics in the year 1971 for his work on physical holography of laserless photography where any minute piece from the photograph can be enlarged to whole. Recently with femto second lasers it is possible to make a holograph of the whole head with a single flash! Another illustrious example is Michael Talbot’s work in this direction [3]. Mexican neuroscientist Grinberg-Zylbozbaum is of the opinion that consciousness transfer between entrained brains occur through a pre-space structure in a nonlocal holographic way [4]. Walter Schenopp [5] from the University of Siegen, Germany and Peter J. Marcer [6], Chairman Cybernetics Machine Specialist Group, UK., have developed the model of Quantum Hologram, “a quantum entangled nonlocal information structure emitted by all matters”, an information mechanism in
The methodology is based on

1. Imagination
2. Intuition
3. Speculation
4. Constructive logic
“I believe in intuition and inspiration. Imagination is more important than knowledge. For knowledge is limited, whereas imagination embraces the entire world, stimulating progress, giving birth to evolution. It is strictly speaking, a real factor in scientific research.”

- Albert Einstein
Objective of this presentation

1. To share my thoughts and constructions

2. To stimulate great minds in the desired direction

3. In the process, to make a new beginning
The Agenda for the Science of Information could be set up on

1. Structure / Geometry of Information
2. Tour of Information
3. Mechanics / Dynamics of Information
4. Relationship / Equation with Other entities
What could be the Structure of Information?

*God geometrizes*,
  - Aristotle
Objective Pole

Subjective Pole

Information is Bipolar

“Information is that which reduces Uncertainty” - Shannon

Objective uncertainty & Subjective uncertainty

Perceived, Conceived, Experienced Uncertainty could be alleviated by appropriate input of information
Information

1. Signal aspect
2. Symbolic aspect

“…Signals and symbols belong to two different universe of discourse: a signal is a part of the physical world of being; a symbol is a part of human world of meaning. Signals are ‘operators’; symbols are ‘designators’……”

E. Cassirer (1994)

An Essay on Man

An Introduction to the Philosophy of Human Culture, Yale University Press, p. 32
Information Manifold

Not-always-active Information

Active Information

Responsible for qualia of intent

Responsible for the alleviation of the sense of uncertainty

Responsible for qualia of ‘form’ and movement

3 1 2
<table>
<thead>
<tr>
<th>Three folia of Information</th>
<th>Interacts with</th>
<th>Results in</th>
<th>In the domain of</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Measurable folium</td>
<td>Matter</td>
<td>Uncertainty reduction</td>
<td>Material science</td>
</tr>
<tr>
<td>2. Content folium</td>
<td>Mind</td>
<td>Delivery of form and energy</td>
<td>Psychological science</td>
</tr>
<tr>
<td>3. Intent folium</td>
<td>Self</td>
<td>Intentionality causality purpose</td>
<td>Science for consciousness</td>
</tr>
</tbody>
</table>
Measurable-Folium

Interacts with Physical world

Information

Intent-Folium

Interacts with Self

Content-Folium

Interacts with Mental World
Alternate Geometry of Information is that of a Spiral
Tour of Information
from
Consciousness-world
to
Physical world
Information has its own Dynamics

Information on Quantum particles explain Q. puzzles / Q. paradoxes

Sub quantum Nest

Sub-sub- quantum Nest

Nest IV

Nest III

Planck's Scale

Quantum Nest

Quantum Particles

Classical Nest

Information retains ability to drive home its message

Information looses ability to drive home its message

Quantum-Classical Transition

Changeable Be-able
Information

Quantum Particles

Changeable

Be-able

Information looses ability to drive home its message

Information retains ability to drive home its message

Quantum-Classical Transition

Non-informational Molecule

Informational Molecule

Cholesterol, Glucose, Albumin etc.

Inorganic

Silicon

Organic Molecule

Carbon

DNA, RNA, Enzymes

Planck's Scale

Sub quantum Nest Nest III

Nest II

Nest I
Information Loss

Information Loss I
(1\textsuperscript{st} break in causality chain)

Information Loss II
(2\textsuperscript{nd} break in causality chain)

Information Loss III
(3\textsuperscript{rd} break in causality chain)

Information Loss IV
(4\textsuperscript{th} break in causality chain)

Information on Classical vehicle

Information on Non-informational Molecule
Cholesterol, Sugar

Information on Inorganic Molecule
Silicon

Information on Informational Molecule
DNA, RNA, Enzymes

Quantum Particles

Information looses ability to drive home its message

Information retains ability to drive home its message

Changeable

Be-able

Quantum-Classical Transition
What does Information do?

Development of Science of Information is related to unraveling of its dynamics/mechanics.

The mechanics played by Information could be called Information Mechanics.
Determinants of Information Mechanics

1. Location of Information
2. Content of Information
3. Contextual Set-up
4. Information Propensity / gradient
5. The system in which information works
1. The behavior of the quantum particle as we observe is because of information therein.

2. A number of quantum paradoxes could be explained if we consider the role of information in it.

3. Although to a large extent left independent, quantum mechanics is eventually governed by Information Mechanics.
<table>
<thead>
<tr>
<th>Information Entanglement</th>
<th>Quantum Entanglement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Connects matter, mind and self</td>
<td>Connects to all in the nest of nature which obeys laws of Quantum Mechanics</td>
</tr>
<tr>
<td>More elaborate and really multi-dimensional</td>
<td>Elaborate in material plane</td>
</tr>
<tr>
<td>More proximate to consciousness</td>
<td>Farther from Consciousness, mind or self</td>
</tr>
<tr>
<td>As it connects mind, matter and self, so it can connect different objects, different subjects and objects with the subjects</td>
<td>As it connects only matter at quantum level, so it connects only objects. It cannot connect objects with subjects or different subjects</td>
</tr>
</tbody>
</table>
Information Dynamics

1. Mechanics of waiting
2. Mechanics of opportunism
3. Mechanics of causal execution
4. Mechanics of creative emergence
5. Mechanics of new creation
Any Equation? or Relationship?
Relationship
I. Gene – Information Relationship
Gene-Information Relationship

Genes neither generate information, nor can it use information.

Most likely it is Information which uses genes as means to achieve their end.
1. Principle of Redundancy in the language of Genes

   Enormous number of genes is a sheer wonderment!

2. Organic Evolution is mostly algorithmic but not always a-teleological

   In artificial life unit (A-Life), evidence are accumulating to suggest teleology playing a role.

3. Genes exchange information with outside

   Genes do not contain all information necessary and sufficient to account for Evolution. Genes are not informationally closed.

4. Gene jumps (Barbara McClintock)

   Mobile genetic elements (transposons) reshuffle, re-assort the genome to set it in conformity with the desired information, to set the proper context, to conform to the grammar of the goal of expression.

5. Central dogma of Molecular Biology

   Established only following that ‘Momentous Transition, the enclosure, encapsulation of Cosmology into Cell Biology
Dogma Busters

1. Reverse transcriptase (David Baltimore and Howard Temin)

2. Catalytic RNAs (ribozymes). Proteins are not the only structures capable of catalyzing a reaction.
   (i) "self-splicing" Introns (Tom Cech)
   (ii) 23S rRNA of the ribosome (Harry Noller).

3. "prion" (proteinaceous infections particle) (Stanley Prusiner).
“The conclusion seems inescapable that cells are able to sense the presence in their nuclei of ruptured ends of chromosomes and then to activate a mechanism that will bring together and then unite these ends, one with another. And this will occur, regardless of the initial distance in a telophase nucleus that separated the ruptured ends.

The ability of a cell to sense these broken ends, to direct them to each other, and then to unite them so that the union of the two DNA strands is correctly oriented, is a particularly revealing example of the sensitivity of the cells to all that is going on within them.”

- Barbara McClintock
II. Meme – Information Relationship
“The new soup is the soup of human culture. We need a name for the new replicator, a noun which conveys the idea of a unit of cultural transmission, or a unit of imitation. ‘Mimeme’ comes from a suitable Greek root, but I want a monosyllable that sounds a bit like ‘gene’. I hope my classicist friends will forgive me if I abbreviate mimeme to meme. If it is any consolation, it could alternatively be thought of as being related to ‘memory’, or to the French word meme. It should be pronounced to rhyme with ‘cream’.”

- Richard Dawkins
Addition and Deletion of information or alteration of quality of its information content causes restructuring of Meme
III. Information-Self Relationship
An emergent from Brain-bound Consciousness

Informed
(i) That it is Indivisible from UC
(ii) It has to behave within the given constrain
(iii) It is the `bridge’ between Brain-bound & Brain-independent consciousness.

Self

An emergent from Brain-bound Consciousness
IV. Life-Information Relationship
What is not known about operation of ‘life’?

1. How organization of life differ from self-organization?

2. How living organism generates information and organizes information?

3. Why development of consciousness is seen only in living organism?
V. Information – space time Relationship

Destiny of Information
In *formation* (Greek: *informare*)

**IN** **FORM** **ATION**

(Latin: *informatio*) (Noun)

(Greek: *informare*) (Verb)

(Prefix) (Stem) (Suffix)

(within/into) forma (ito – action or process)

(“To put ‘form’ into process”)
Information split
or
Inside becoming out?
Information

Mind conceives information and delivers space, time and energy.
What the sense organs can understand and deal with are
(i) form and
(ii) movement.

Mind breaks non-sensible information into sensible components.

Energy initiates movement while space and time create form.
<table>
<thead>
<tr>
<th>What could make information’s inside out?</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mind</strong></td>
</tr>
<tr>
<td><strong>Quantum fields</strong></td>
</tr>
<tr>
<td>The organ of communication between two conscious system</td>
</tr>
</tbody>
</table>
Information Split

Form'  Energy

Mind  Neurons

‘Form’ in the Mind is processed as ‘Idea’

The Basis of Psychosomatic Connection
Information

Becomes Matter

Outside the brain

Quantum Fields

Energy

Inside the brain

Used by Neural manifold

MIND

Taken as Idea

Processed in Mind

Manifest as Space, Time

INFINITY
VI. Consciousness – Information Relationship

Source of Information
The Principle of Similia Similibus
The Uncertainty in relationship between Masculine and Feminine components of non-local entities is the cause of genesis of Information.

Inside Boundary of the System
Information reduces uncertainty

ZPE

Outside Boundary of the System
Information is generated out of uncertainty

EM

Boundary of the Universe
V. Mantra is Information on the Divine
THANK YOU
Dr. A.K. Mukhopadhyay is standing in the first standing row, 7th from left.
Observing Creation

“I was looking at my Mind!
   Between Me and Infinity,
   Often distinct, often an ever-fading line!
   It is my Mind.”

“Passively, on itself it winds,
In action, it grows mighty wings.
   Between Finite and Infinite
   An amazing swing!

   It is my Mind.”

“One day Information approaches her,
With passion, aggression and intense desire.

In his captivating charm, she submits to conceive.
Through nonlocal communication, she perceives
A command to deliver ‘Form’,
 Which is Information’s inside!”
“The play of Love, Sex and Aggression, Happens outside scientist’s box of vision”

“What one sees are only quantum fields! Measurable entity, within scientist’s skill”

“Born are Energy Time and Space. Visible children from Infinity’s mess!”

“There are Fields and all the more, Energy and matter, a gala furore!”

“Scientists get busy playing with them. Conceals Infinity, how It so became!”

- Dr. A.K. Mukhopadhyay, 2005