

# Quantum Field Theory, Consciousness and Jainism

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## Abstract:

Jainism [[1]and Appendix 1], is one of the major three religious systems of India. It is well known for its rational and a scientific methodology. Here their theory of karmasis presented which describe interrelation between soul and matter. They talk about a pure soul which has infinite intuition, infinite knowledge, infinite bliss and infinite power. However, a worldly soul is always infected with matter known as karmas which obstructs these four properties. [2].Five different types of knowledge are described which include telepathy and clairvoyance also. The material karmas are of eight major types and 158 minor types. The model is similar to quantum field theory used to study superfluid and superconductivity where one has a highly ordered ground state at low temperature and elementary excitations at higher temperature. They also define fourteen stages of spiritual evolution through which one can pass with decreasing amount of these karmas and can acquire a pure soul [3]. Three examples are given which show that during higher stages of consciousness, one can have remarkable memory and they have even tried to estimate sizes of smallest particles of matter which is comparable to the current sizes of atoms and nuclei, indicating new frontiers of knowledge [4].

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## **Introduction**

In Jainism, the world is assumed to be consisting of six elements. They are: Dharmastikaya (Medium of motion), Adharmastikaya (Medium of rest), Akashastikaya (Space), Pudgalastikaya (Matter), Jeevastikaya (Living beings having a soul) and Kala (Time). Jainism has defined the soul as the basic constituents of all living beings. According to the conception of Jainism, a perfect soul has infinite knowledge, infinite intuition, infinite bliss and infinite power. Although perfect soul has other characteristics but the knowledge has been regarded as the chief characteristic of soul. All species may be physically different but are existing in the world from the past which does not have any beginning. It is due to their attachment with material particles known as karma that they continuously take birth in the world again and again. Also it is these karmas who obstruct these intrinsic qualities of the pure soul. Hence it is stated that the direction of evolution should be towards a goal of liberalizing the soul from all material attachment that is all karmas. A process of selection by oneself is involved in spiritual evolution as certain rules and principles have to be followed described separately for ordinary humans and for enlightened souls like acharyas and sadhu sadhvis etc. It appears that practices like chanting of mantras, doing meditation (samayik), fasts (upwas, aaymbil, varshi tap, mas khaman, updhan, siddhi tap, nanayanuyatras), and other several practices lead to very stable life, increase in self-confidence, recognition of inner strength of soul, and ultimately evolution of one's soul. This model is quite similar to the quantum field theory like models used to study say superfluity and superconductivity [4]. In case of QFT, we have a highly ordered vacuum state with elementary excitations on this, whose number increases as temperature increases. In Jainism, there is a pure soul with infinite knowledge and other three infinities with karmas who obstruct these qualities of the pure soul.

It is found that during the higher stages of consciousness, a person shows remarkable memory like that of Swamy Vivekanand [5]. There is a phenomenon called Shatavadhan [4] which has been found in one Jain monk these days and so he can remember one hundred questions (Appendix 2) asked by say 100 different persons in a continuous sequence and can answer them all together in same sequence or reverse sequence and random sequence in the

end. Similarly a table for measurement of length is mentioned in Appendix 3, which starts from the smallest particles of matter (for all practical purposes). One finds that the size estimated by them is quite comparable to the size estimated in the modern science [4]. These examples all show existence of higher stages of consciousness which are accompanied by large increase in memory of the brain and also different mechanisms might exist to acquire knowledge. These states have less elementary excitations like entities (known as karmas in the brain).

### **Comparison between Karma and QM Field Theory.**

According to the Jain doctrine of Karmas, every mundane soul can have an infinite knowledge, infinite intuition, infinite bliss and infinite power (Four infinities). But from an infinite time in the past, it has been infected by matter. This matter has been held responsible for the disorder present in the mundane souls. This form of matter has been termed as Karma. (The word Karma in Jainism does not mean work). The whole universe is full of that kind of matter which can become Karma. Due to the presence of different types or karmas in different quantities, different characteristics are manifested by mundane souls i.e. by different living beings. Thus a perfectly ordered consciousness is analogous to a ground state which is free from any excitations. These excitations then correspond to Karmas.

At every moment, an empirical self is attracting this matter towards him by his actions through mind and body. This matter which has now become karma then remains latent in the empirical self for some time which is determined by the passions at the time of arrival of new matter. Passions in turn are determined by karmas which are already present. Karmas have the following four characteristics (A) Nature, (B) Number, (C) Lifetime and (D) Intensity

#### **Nature**

Different properties of different systems originate from different elementary excitations. Thus phonons, rotons and vortices are meant for different properties of superfluid helium at different temperatures. Similarly in case of superconductors, there is a superconducting state with very high order and there are elementary excitations over it in form of Cooper Pairs. Similarly karmas have

the following species. (number in front of each specie indicates its subspecies). Knowledge obscuring, Intuition obscuring, Feeling producing, Age determining, Belief and conduct producing, Body determining, Status determining and Power hindering.

Each one of these is held responsible for different types of disorder present in the empirical self and impedes the manifestation of true nature of consciousness. Jainas claim that all properties of living beings can be explained in terms of these 8 karmas and their 158 categories. It may be easily noted that some kind of energy gap like thing (in which space?) exists which may prevent us to realize actual nature of consciousness.

### **Number**

The relative number of various elementary excitations present in a system are different at different temperatures and this number vary with temperature. In a similar way the number of karmas changes from one animate to another and within in a given animate they vary from time to time, depending on one's mental state and state of evolution. Their relative quantities are given by the following rule: The age determining species receive the smallest part; a greater portion goes to the body determining and status determining ones, both of which obtain an equal portion. More than that goes to the knowledge obscuring, intuition obscuring and power hindering species each of which gets an equal portion. Still a larger part than this goes to the belief and conduct obscuring species and the greatest of all goes to the feeling producing species. It is obvious that these karmas are not very similar to the matter which constitute the bodies of living beings but are very small in sizes.

This difference in the number will then determine different properties of different animates. In case of concept of elementary excitations, it is again the number of these excitations which determine the disorder in the state of these systems, say at different temperatures.

### **Life Time**

The interaction among various excitations causes scattering among them. Thus in a particular state an excitation stays only for some definite time. Similarly the lifetime of the incoming karmas

depends upon their interaction with karmas already present which actually determine one's passions. This lifetime is then determined by karma-karma interaction.

### **Intensify**

Pure matter is neutral. The various effects are manifested because of its association with the soul. The effect which these karmas can show depends upon their rasa (juice) which is determined by the passions of the empirical self. This intensity is analogous to the energies of different excitations which show different properties. Thus phonons and rotons determine propagation of sound in liquid helium. The properties of sound will depend on the contribution from different parts of the spectrums of these excitations.

The concept of elementary excitations can also explain the phenomena of phase transitions. Thus different phases of helium have been tried to explain interms of elementary excitation picture. Similar situation occurs here in this theory also. There are fourteen stages known as Gunasthānas which have been recognized in this theory which one passes before acquiring the perfect consciousness starting from a state of highest sinfulness. These have been nicely explained in terms of various karmas and their mutual interaction.

### **Phase Transitions, and Evolution of Soul**

The path of evolution of soul in Jainism is described through fourteen stages through which one has to pass before getting liberalized (that is becoming a pure soul from an impure soul which is associated with many material particles known as karmas). These fourteen stages or phases are called fourteen Gunasthanas (Pokharna 2012). Guna means characteristics and sthan means a position or situation. It is very interesting to know that the Jain Acharyas have gone into great depth to describe these fourteen stages. They are being described through twenty nine parameters. (Pokharna 2012). The logic used in taking up so many parameters is highly impressive and there are several subcategories among these twenty nine categories also. An excellent description is given about the movement of a worldly soul from one birth to another and so on. With each stage of development, the knowledge content of soul goes up.

## Higher Stages of the Consciousness

### Remarkable memory

It is too well known that Swami Vivekanand had such a sharp memory that he almost remembered 11 volumes of Encyclopedia Britannica, which he had just scanned once (using read would not be correct). He could virtually recall any line on any page of any of the 11 volumes available at that time. It appears that with continuous dedication and spiritual practices, the state of consciousness evolves and in many cases, it is accompanied by an increase in memory, that is improvements in capture, storage and recalling of objects and events.

### Shatavadhan (Capability to memorize one hundred questions or events and recall)

An example of the hypothesis of the above formalism is given below which is called shatavadhan. Shatavadhan (Shat- 100 + Avdhan) is a power to cover 100 different activities in a single act of attention. One who reaches the stage of shatavadhan is called Shatavadhani. A shatavadhanican remember 100 different things in a 100 different orders, spoken by 100 different people. This unbelievable power has been attained by a handful of people over the human history and because it needs very high stage of spiritual development. According to the modern scientific belief, a normal human being utilizes hardly 2% to 3% of his total mental potential. A common man can hear and remember serially 3 or 4 at a time. This is based on conscious mind. Anyone with exceptional intellect can extend this number from 3-4 to 10-11. However, taking this number to 100 is beyond the powers of most of the people. Shatavadhan is the ability to receive, retain and retain 100 activities accrued through eyes or ear during one period of attention and carried from the conscious to the subconscious. In Jain tradition one can name ShrimadRajchandra, Guru of Mahatma Gandhi [6,7]. Similarly these days, Ajeet Chand SagarjiMaharasaheb, a satavdhani has demonstrated his spiritual powers in Ahmedabad (2008) and Mumbai (2012) who can listen to two hundred questions (or scenes he watches) asked by say two hundred persons at a stretch for say four hours and can answer them in the same sequence or reverse sequence after four hours, just like a machine with almost 100 percent accuracy. He is expected to give a similar

demonstration involving 500 avadhans in Mumbai on November 16,2014.

### **Unexplored Mechanism to Acquire Knowledge**

Another example is taken from ancient Jain scriptures [8]. It gives a Table for measurement of length (Appendix 3). It starts from the smallest particle of matter and goes up to one Yojana (a commonly used unit of length prevalent in ancient India). It indicates that ancient Jain acharyas have made an attempt to develop a table for measurement of length in 20 steps. This is an octal system till step 12. As explained in the Appendix 3, if we statistically interpret it then we find that as per their assessment, the size of the smallest particle of matter (known as avasannasannaskandha from practical point of view in prakrit language) is  $2.9 \times 10^{-11}$  cm. This value lies in between the size of a modern atom ( $10^{-8}$  cm) and size of a nucleus ( $10^{-13}$  cm). Now we may not be knowing the meanings of many of the objects used in this Table. But statistically, this is a very significant observation and should be taken quite seriously by the scientists. At least it should not be ignored. The mere fact that it was arrived at from the telepathy of advance level through which one can see even the smallest particle of matter should be a very exciting observation. This again shows that the Jain concept of knowledge should be taken very seriously by the scientific community and should be further explored in a careful way.

Now the mere fact that this concept might have evolved through a realization of this higher level of consciousness is worth examining. It appears to involve advanced telepathy (known as avadhijnana in Jainism) or some type of advanced knowledge.

### **Qubits, Quantum Information and the Brain:**

Actually the recent developments in computer science and neurobiology clearly show that knowledge is nothing but information organized in some way [9] and information in turn is just organization of data in some fashion. It is also realized that human consciousness (and even animal consciousness) is capable of organizing these data and can generate information and hence knowledge in some way [9]. Therefore what we call as scientific knowledge is just a subset of this grand concept of knowledge, which can exist in the human consciousness. Because

all interpretations of all scientific experiments are ultimately done by human consciousness [10]

Actually it is argued that quantum computers like processes are possible in the human brain even at biological temperature [11]. It is claimed that human sub-consciousness mind works on the basis of quantum computers (assuming tubulin's groups acting as a cellular automata), and so its activities are hidden from us. When the Orch OR takes place, one enters into classical world. Now let us look at the following numbers: [11,10]

Number of neurons in the human brain:  $10^{11}$

Number of synapses per neuron in the human brain:  $10^3$

Number of operation per synapses in one second:  $10^3$

Number of bit states per second in the human brain:  $10^{17}$

Number of tubulins per neuron :  $10^7$

Number of oscillation per Microtubule :  $10^8$

Nanosecond switching in Microtubule automata per neuron per second :  $10^{16}$

Hence for a human brain, number of bits offered per second:  $10^{27}$

Thus till quite recently, capacity of human brain was assumed to be possess  $10^{17}$  bits states per second in the human brain. It was based on the assumption that there are  $10^{11}$  neurons in the brain, and on the average there are  $10^3$  synapses per neuron and again there are around  $10^3$  digital operations per synapse per second. And these are treated as classical bits. However, with the new discovery of tubulins who individually and collectively (entanglement) behave as quantum systems, this human capacity has gone upto  $10^{27}$  quantum bits of information. It is so because now there are around  $10^7$  tubulins and there can be at least  $10^9$  (actually in the range of  $10^9$ - $10^{11}$  oscillations per second). So this number of  $10^{16}$  has to be multiplied with the total number of neurons in the brain is, which is  $10^{11}$ . This may be compared with performance of the best supercomputer in the world that is A 1 exa FLOPS (EFLOPS) computer system, which is capable of performing one quintillion ( $10^{18}$ ) floating-point operations per second. However, in case of brain, these bit states are not classical bits but quantum bits (known as qubits). Hence this will ultimately leads to almost infinite information, as per the latest work in the field of quantum computers and quantum information. This means that a human brain essentially can possess almost infinite knowledge. This idea is

therefore very close to the concept of infinite knowledge possessed by a pure soul in Indian philosophy in general and Jainism in particular.

It appears that the spiritual practices of Jain and other Indian monks results into decrease in decoherent activities in their brain and realization of the quantum information through the biological quantum computers.

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### Appendix 1.

Jainism , traditionally known as Jaina Dharma is an Indian religion that prescribes a path of non-violence towards all living beings and emphasizes spiritual independence and equality between all forms of life. The essence of Jainism is concern for the welfare of every living being in the universe. Practitioners believe that non-violence and self-control are the means by which they can obtain liberation. Jains believe in the notion that truth and reality are perceived differently from diverse points of view. This doctrine is formally called *anekantavada*. According to it, human beings are always limited in their perception and knowledge about the reality. They can thus have only partial information/knowledge of reality. Philosophical and theological disputes arise only because of the partial knowledge of human beings. The Jain doctrine stresses on the existence of soul. According to Jainism, every living being is a soul and have a separate existence from the body that houses it. This soul undergoes a cycle of reincarnations. Jainism postulates the

existence of fine particles of matter called *karma*. These karmic particles are attached to the soul from infinite past. On account of the soul's interaction with the karmas and it is through this karma that the soul is reincarnated and feels pleasure and pain.

The word Jainism is derived from a Sanskrit verb *Ji* which means *to conquer*. It refers to a battle with the passions and bodily pleasures that the *Jaina* ascetics undertake. Those who win this battle are termed as *Jina* (conqueror). The term *Jaina* is thus used to refer to laymen and ascetics of this tradition alike. Jainism is one of the oldest religions in the world. Jains traditionally trace their history through a succession of twenty-four propagators of their faith known as *tirthankara* with Ādinātha as the first *tirthankara* and Mahāvīra as the last.

## Appendix 2.

Details of one hundred questions answered in same sequence by Shri Ajeet Chandra Sagarji Maharasahab in the process of Satavdhan.

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- 1 to 10 One Line sentences may be in questioners form  
 11-20 Words of Wisdom in a sentence of 5 to 7 words  
 21 First line of a Sanskrit Shloka  
 22 to 30 Synonym or Antonym in Gujarati  
 31 Second line of the same Sanskrit Shloka  
 32 to 40 Idioms  
 41 Third line of Sanskrit Shloka  
 42 to 50 Any first line of the same Sanskrit Shloka  
 52 to 60 Names of any priest, religious book or religious place  
 61 A mathematical puzzle  
 62 to 70 Name of any philosopher, scientist or patriotic person  
 71 First part of 16 Blocks- mathematical miracle  
 72 to 80 See and Remember ( Darshan Avadhan)  
 81 Second part 16 blocks- mathematical miracle  
 82 to 90 See and Remember (Darshan Avadhan)  
 91 9 Blocks- Mathematical miracle  
 92 to 99 Mathematical calculation with 8 persons  
 100 Day of the Birthday  
 101-104 A line from Religious, cultural or patriotic song  
 105 to 108 Shloka from Jain Aagams
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### Appendix 3.

Table of Measurement of Length as Found in the Jain Literature [8]

(1)	Infinitely many parmāṇus	=1 Avasannasannaskandha
(2)	8 Avasannasanna units	=1 Sannasannaskandha
(3)	8 Sannasanna units	=1 Trutreṇu
(4)	8 Trutreṇu units	=1 Trasareṇu
(5)	8 Trasareṇu units	=1 Rathareṇu
(6)	8 Rathareṇu units	=1 Uttamabhogbhūmibālāgra
(7)	8 U. b. b. units	=1 Madhyamabhogbhūmibālāgra
(8)	8 M. b. b. units	=1 Jaghanyabhogbhūmibālāgra
(9)	8 J. b. b. units	=1 Karma bhūmibālāgara
(10)	8 K. b. b. units	=1 Liksā
(11)	8 Liksā units	=1 Yūkā
(12)	8 Yūkā	=1 Yava (Barley corn)
(13)	8 Yava units	=1 Angula (Finger breadth)
(14)	6 Angula units	= 1 Pāda
(15)	2 Pāda units	=1 Vitasti
(16)	2 Vitasti units	=1 Hasta (Forearm)
(17)	2 Hasta units	=1 Rikku or Kisku
(18)	2 Kisku units	=1 Daṇḍa or Dhanus (Bow)
(19)	2000 Daṇḍas units	=1 Krosa
(20)	4 Krosa units	=1 Yojana

Here a parmāṇu has been defined as the smallest particle of matter having no length, no breadth and no height. This is defined as a particle which can be only thought of but is not practically perceivable. The particle which is perceivable is a group of parmāṇus. The smallest of such skandha is an avasannasannaskandha. Let us therefore estimate its size by roughly taking the average size of a finger to be equal to 2 cm. We can therefore write the following simple formula by using the above table .

$$2 \text{ cm} = 8^{12} \times \text{size of avasannasannaskandha}$$

$$\text{Therefore Size of avasannasannaskandha} = 2 \times 8^{-12} \text{ cm.}$$

$$= 2.9 \times 10^{-11} \text{ cm.}$$

Hence the size of smallest particle of matter that is avasannasannaskandha is around  $2.9 \times 10^{-11}$  cm. This value lies in between the size of a modern atom ( $10^{-8}$  cm) and size of a nuclei ( $10^{-13}$  cm). Now we may not be knowing the meanings of many of the objects used in this Table. But statistically, this is a very significant

observation and should be taken quite seriously by the scientists. At least it cannot be ignored. The mere fact that it was arrived at from the telepathy or some advanced channel of knowledge through which one can see even the smallest particle of matter. This again shows that Jain concept of knowledge should be taken very seriously by the scientific community and should be further explored in a careful way.