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## **Jain Philosophy and Modern Physics**

Prof Narayan Lal Kachhara

55, Ravindra Nagar, Udaipur 313003, Rajasthan, India

Jain Philosophy and Science Study Center, Udaipur

### **Abstract**

Jain philosophy does not accept any Creator God; it puts forward an alternative theory for existence of both the living and the non-living world. According to Jain philosophy the cosmos comprises of six kinds of independent and distinct substances, *jiva* (sentient substance), *pudgala* (energy and matter), *akasa* (space), *kala* (time), *dharmastikaya* (agent for motion) and *adharmastikaya* (agent for rest). All the six substances are eternal, co-exist and accommodate each other and, though mixed, maintain their separate identity. Jain philosophy describes the attributes of the substances, their modes and qualities. A substance is capable of eternal continuous existence through infinite succession of origination and cessation, preserving its basic nature.

The characteristic attribute of *pudgala* is that it possesses the properties that are sense perceptible (in the existing state or its mode). The ultimate indivisible unit of *pudgala* is called *paramanu*, which is the constituent of all energy and matter. *Akasa* (space) is the container of all other substances; it is boundless/infinite, eternal and indivisible unit and non-physical. The other five substances are confined to a tiny part of *akasa* called *loka* (the universe). *Kala* substance is also eternal; it defines the duration, change, motion, newness and oldness of substances. *Dharmastikaya* and *adharmastikaya* are single individual and homogeneous continuums pervading the whole *loka* (only).

The paper deals with the general description of *pudgala* and some details of the other four non-living and formless substances and their comparison with the concepts of modern physics.

Key words; Jain philosophy, Substance (Reality), Six Substances

## **1 Substance**

The term substance is used in specific sense in Jain philosophy. This refers to the fundamental substances that constitute the *Loka*. *Loka* is also a technical term of Jain philosophy meaning the entire space in which all the six realities exist. The *Loka* is supposed to be much bigger than the universe known to science. A substance (*dravya*) is capable of eternal continuous existence through infinite succession of origination and cessation. A substance is also the assortment of qualities / attributes. It experiences transformation or modification of its state. During this process of transformation the precedent mode ceases to exist and the succeeding mode originates but the basic nature of the substances is preserved in this change. This trinity of origination – cessation – permanence (OCP) is the basic characteristic of a substance. This rule applies to all substances and objects in nature. The attribute of permanence implies that a substance can neither be created nor destroyed; it can only change its form. Thus a substance is a reality or truth having permanent existence through change. Anything that does not confirm to the OCP rule is not a reality or a substance. All objects are, in fact, transitory permanent i.e. they are transient in respect of modes and attributes and permanent in respect of their basic substance hood. No object can be purely transitory or purely permanent. This is true of all objects whether living or non-living, physical or non physical, subtle or gross.

A substance has three characteristics, it is real, it follows the OCP rule, and it possesses attributes and power of modification. The substance, the attributes and the

power of modification, all three co-exist simultaneously, no one can be separated from the other. The attributes discriminate between substances and modification produces conjugated form of substance. There can be no modification without a substance and no substance can exist without modification. Similarly, there can be no substance without an attribute and no attribute can exist without a substance.

Many attributes co-exist in a substance but the modifications take place in succession. Co-existence indicates steadiness and occurrence of successive change represents dynamic nature of a substance. Modification is a continuous process and the modes come in existence one after another. A new mode can not come in existence without the cessation of the previous one and a mode cannot cease to exist without origination of a new mode. The modification process is such that many cessations and originations take place in one '*samaya*'. A '*samaya*' is the smallest unit of time, a very tiny fraction of a second as described later. All these characteristics are typical of a substance.

## **2 Six Realities or Substances**

According to Jain philosophy there are six (and only six) kinds of substances in nature.

- (i) *Dharmastikaya* (or *Dharama*) – It helps motion of *Jiva* (life) and *pudgala* (matter and energy)
- (ii) *Adharmastikaya* (or *Adharma*) - It helps *Jiva* and *pudgala* to assume rest position.
- (iii) *Akasastikaya* (or *Akasa* or space) - It provides accommodation to all other five realities.
- (iv) *Pudgalastikaya* (or *Pudgala*) – It means all matter and energy.
- (v) *Jivastikaya* (or *Jiva*) – It refers to all forms of life.
- (vi) *Kala* – time.

All the six substances co-exist and accommodate one another. Although they are mixed with each other they maintain their separate identity. The suffix '*astikaya*' used in

first five realities above refers to the property of spatial extension. These substances are homogeneous continuum composed of multiple parts or *pradesas*. A *pradesa* is the space occupied by one *paramanu*. The term '*astikaya*' is a compound word made up of '*asti*' and '*kaya*' which respectively mean '(real) existence' and extensive body. The term *astikaya* thus means a real extensive magnitude i.e. having plurality of parts, (*pradesa*) in its constitution. *Kala* (time) is not an *astikaya*, it has neither extension in space nor plurality of parts. Each of these substances continues to exist as an entity eternally.

### **3 Attributes of Substance**

A substance is always associated with certain attributes called *gunas* (qualities). Each substance has infinite attribute, without this the existence of a substance is not established. Attributes are of two types, common attributes and special attributes. The common attributes establish the identity and the special attributes define the specialty of a substance. The common attributes are characteristic of more than one substance and the special attributes are individual.

There are ten common attributes, the first six are universal and are found in all substances.

#### **(i) *Astitva* - Eternal existence**

Eternal existence means continued presence of a substance without going in extinction. It is a virtue of this attribute that the substance is neither created nor may it ever be destroyed and it maintains its eternal identity.

While propounding the division of Universal Reality into six substances each with its own particular characteristics, the Jain philosophy also emphasizes their unity by propounding certain universal attributes possessed by all of them. The universal attributes "existence" may be regarded as the highest universal, and is proclaimed by Jains to be *mahasatta* i.e. essence of reality. This means that in spite of their multiplicity; the six substances comprise one universal system. This aspect of unity (viz. *mahasatta*) is emphasized not only in the individual substance's constitution as an individualistic trait (i.e. *avantarsatta*) but the unity of all real. Existence, however, should not be abstracted and postulated as the unitary substance of which the other

substances may be taken as *paryayas* (modes). The six substances, in spite of their common characteristics of existence, are fundamental and irreducible one to another.

(2) *Vastutva* - Causal efficiency

Every substance is capable of performing a purposeful action (*arth kriya*). This happens due to its causal efficiency which emphasizes the aspect of 'change' in the substance.

Both 'being' and 'becoming' are necessary concomitants of reality and one is as ultimate as the other. Becoming or change presupposes causality, which is the fundamental nature of all real. According to Jaina, change is integral in a substance and the stimulus of change is seated in the very nature of substance. This is *vastutua* or causal efficiency.

(3) *Dravyatva* – Substance hood

Substance hood is an attribute by which the mode of a substance keeps on changing continuously. The quality of substance hood enables a substance to be substratum of qualities and modes. Qualities and modes cannot exist without any support. Such a support is the substance. The quality characterizes the substance and the substance has the quality.

(4) *Prameyatva* – Objectivity

By virtue of this attribute a substance can become an object of one's knowledge.

(5) *Pradesatva* – Spatial existence

By virtue of this attribute the substance extends into the space. Therefore each substance has a shape.

(6) *Agurulaghutva* – Eternal persistence (Identity)

By virtue of this attribute the substance preserves its specific substance identity and the qualities retain their quality hood during change. The substance and qualities, in spite of numerous changes, maintain their separate identities. This attribute is the reason for individuality of a substance.

. The special attributes are as follows.

- a) Soul – consciousness (*cetana*), righteousness (*samyaktva*) conduct (*charitra*) and dynamic nature (*kriyavati shakti*).
- b) Matter – Touch, taste, smell, sight, dynamic nature.
- c) Motion helper (*dharma*) – to provide passive help to soul and matter in their movement.
- d) Rest helper (*adharma*) – to provide passive help to soul and matter to stop.
- e) Space (*akasa*) – to give accommodation to all other five substances.
- f) Time (*kala*) – an essential instrument of change in all substances.

#### **4 The Modes (*Paryaya*)**

The modes subsist in both substance and quality. They are infinite in number and transitional in nature. In other words, cessation of the precedent mode is followed by the origination of succeeding mode. The constant ongoing modification of a substance is called a mode. The modes are of two types – intrinsic mode (*arthparyaya*) and extrinsic mode (*vyanjana paryaya*). The intrinsic or substantive (attributive) mode is the intrinsic change in a substance which is subtle and continues without any external influence. The extrinsic mode (spatial modification) is the gross mode of existence which is stable and lasts for some time. The *jiva* and *pudgala* have both kinds of modes whereas the other four substances have only intrinsic modes. It may be noted that qualities and modes cannot be absolutely different from the substance nor can they be absolutely identical with it. The difference is only that of reference and not that of existence. The continuous change that takes place in consciousness is *jiva*'s intrinsic mode while its existence as a particular organism, say a man, is *jiva*'s extrinsic mode which is with a determinate life – span. The molecular disintegration and aggregation that occur every moment in a physical object is an intrinsic mode. The physical object may have a particular mode – say a cup – for certain duration of time. This state of cup is extrinsic mode of matter.

#### **5 *Pudgalastikaya***

*Jiva* and *pudgalastikaya* are the two main substances in *loka*; the rest four viz., *dharma*, *adharma*, *akasa* and *kala* are passive helping substances. The word *pudgala* is

a derivative made up of two words: *pud* meaning combining or fusion and *gala* meaning dissociation or fission. The properties of fusion and fission, which characterize all matter, are also responsible for the name *pudgala* given to this substance.

The characteristic attribute of *pudgala* is that it possesses the properties, which can be perceived by sense organs viz. colour, smell, taste and touch. Concomitance of all the four is emphasized by the Jains. In other words, if a thing is perceived by the sense of touch, it must also necessarily possess smell, taste and colour. Whereas the other four *astikayas* are indivisible i.e. not disintegrable, *pudgala* is divisible. The ultimate indivisible unit of *pudgala* is called *paramanu*. *Paramanu* is the pure form of *pudgala* and all matter and energy are modes (impure) of *paramanu pudgala*. The *paramanu* can neither be created nor can it be destroyed. It is eternal. Although it possesses sense – qualities, it cannot be an object of sense – perception. It is the subtle most physical entity. By itself it transcends the sense experience, though it is basic constituent of all perceivable objects.

Some attributes of *pudgala* were briefly described above. *Pudgala* is the only substance which has a form (*murta*) and perceivable. *Rupatva / murtatva* or sensory perceptibility is the sum total of the four sensuous qualities mentioned above. All mutation of matter must possess all the four qualities as follows.

- ❖ Colour. Five types of primary colour : Black, blue, red, yellow, white
- ❖ Taste. Five types of taste: Sweet, bitter, pungent, sour & astringent
- ❖ Smell. Two types of odour: Good smell and bad smell.
- ❖ Touch. Eight types of touch: Cold, hot, smooth (positive charge), rough (negative charge), light, heavy, soft and hard.

Based on above qualities the substances can be of four types.

- (i) Substance having one colour, one smell, one taste and two touches.
- (ii) Substance having five colours, two smells, five tastes and four touches.
- (iii) Substance having five colours, two smells, five tastes and eight touches.
- (iv) Substance having none of these qualities – intangible substances.

Based on touch the *pudgala* is of three types

- (i) Two touch (primary) *paramanu*.
- (ii) Four touch (primary) subtle (*sukhma*) aggregates (*skandha*) -energy.
- (iii) Eight touch gross (*badara*) aggregates-energy and matter.

Cold, hot, smooth and rough are primary touch qualities of *pudgala*. The first two touches signify the thermal property of *pudgala*. The smooth touch is regarded as positive charge and the rough touch is regarded as negative charge. Thus *pudgala* has an electric property. The other four touch qualities viz. light, heavy, soft and hard are secondary touch qualities. These touch qualities develop when bonding between infinite *paramanus* produces a gross aggregate. If number of negative *paramanus* is more in the bonding process the aggregate contains light touch quality and if positive *paramanus* are more then heavy touch is produced in the aggregate. When positive *paramanus* are in majority and they bond in cold condition soft touch is produced and when a majority of negative *paramanus* bond in hot condition hard touch is produced in the aggregate. The mass (or weight) of the aggregate is said to relate to the light and heavy touch qualities. These two qualities always co-exist, they are not found separately in aggregate. The four touch aggregates and *paramanu* are *agurulaghu* and mass less. The mass is a property of gross aggregates having eight- touch.

Scientists believe that the normal matter that follows the known laws of science comprises only 4-5 percent of the total matter in the universe. About 70 percent of the total mass is supposed to be dark energy and the rest mass as dark matter about both of which not much is known. According to Jain philosophy the eight-touch matter is detected by instruments, made of similar matter, and must compare with the normal matter. The four-touch and two-touch matter cannot be directly detected by eight-touch instruments and therefore may correspond to the dark energy. Jain scriptures also mention of *Tamaskaya* and *Krishnaraji*, a form of matter that has very large attraction, which may compare with dark matter.

A subtle aggregate and *paramanu* are not perceivable in that form but if the same aggregate assumes a gross form on modification it becomes perceptible. It is because of this property that a subtle aggregate is also said to be the subject of sense

organs. The mind can perceive the subtle as well as gross objects. The mind does not physically contact the object of its knowledge but perceives it by resolve. The mind with the help of sense organs acquires the cognitive and articulate knowledge. Only some modes of all substances become the object of cognitive and articulate knowledge. The scriptures are *pudgala* in physical form but are non-physical in the articulate form. With the help of articulate form of scriptures and its own thoughts the mind perceives both the gross and subtle objects. The omniscient knows fully the physical and non-physical objects including a *paramanu*. A person with clairvoyance knowledge also has the ability to perceive gross and subtle objects. Common persons know subtle objects by scriptural knowledge and inference.

### **6 Jivastikaya (or Jiva, Soul)**

*Jiva* is the generic name of sentient substance. *Jiva* substance is non physical and is not sense - perceptible; it does not have the properties of colour, smell, taste and touch. Consciousness and *upayoga* are the differentia of the *jiva*. *Upayoga* and consciousness are the two sides of the same entity *jiva*. Consciousness may be interpreted both as a structure and a function of the *jiva* but *upayoga* refers to the functional side only. *Upayoga* gives us almost the same meaning as we get by being mentally active. Just as a mental activity is a fact of mental functioning and a mental capacity, a fact of mental structure; in the same way consciousness or *chetana* may be taken as a fact of the *jiva's* structure and *upayoga*, as a fact of the *jiva's* function.

Consciousness is the generality of the attributes (if not of all the attributes of the *jiva*), which distinguish the *jiva* from the inanimate. *Upayoga* is the generality of the manifestations of such attributes. Consciousness manifests itself in several ways: intelligence, knowledge, intuition, bliss, perception (cognitive elements), emotions, will, attitude and behaviour, awareness of pleasure and pain. Intelligence (cognitive and creative power of *jiva*) and intuition are agreed to be the two main manifestations (*upayoga*) of consciousness. Both of them are comprehensions of the object by the subject. Life and consciousness are coextensive. Wherever there is life, there is consciousness and vice versa. But there are degrees of explicitness or manifestation of

consciousness in different organisms. In the lowest class of organisms, it is very much latent, while in human beings, it is very much manifest. *Jiva* is entirely distinct from inanimate existence, which does not possess consciousness.

The *jiva* may be pure or impure. *Jiva* naturally exists in impure form. The impurity in *jiva* is due to karma attached to it, *jiva* without karma, which are *pudgala*, is not found naturally. Thus, the *jiva* which was described as non corporeal above is corporeal as found in nature. In practice only the impure corporeal form of *jiva* is capable of performing physical acts, the non-corporeal form of *jiva* cannot do anything physical. This must be clearly understood. There are infinite *jiva* in the *loka* (whole universe) and their number is fixed. No *jiva* can be created or destroyed.

Some of the observations, which help validate the existence of soul, are:

1 Self-consciousness possessed by a living being like I am, I am happy, I am sad, etc. The body does not make such experiences. Expressions like, I have done it, I do it, I will do it indicate the existence of soul the doer.

2 The intention of doubt, curiosity, inquisitiveness, etc. is expressions of consciousness. The doubt I am or I am not, also generates in soul and not in the body.

3 The soul is the counterpart of matter (*ajiva*). The existence of a substance without a counterpart cannot be supported logically.

### **7 Dharmastikaya (Dharma)**

*Dharmastikaya* is helpful in the motion of active substances. It is a single individual and homogenous continuum pervading the entire *loka*, but does not extend beyond it. In fact, it is a cause of finiteness of the *loka*. Temporally, *dharma* is beginning less and eternal. Being non-physical and non-corporeal (*amurta*), it is devoid of sense-qualities of smell, taste, touch and colour, and, therefore, imperceptible to the sense – organs and physical instruments. Immobile itself, it passively assists the motion of mobile objects like *jiva* and matter and micro movements in all realities. Not even the minutest vibration is possible without the assistance of *dharma*. Hence, where there is no *dharma*, there is neither psychical activity nor physical activity like functioning of nerves, beating of heart, winking of eyelids, propagation of light waves, vibrations of any

kind etc. *Dharma* passively assists the *jiva* and *pudgal* but does not actively help in their movement.

### **8 Adharmastikaya (Adharma)**

*Adharmastikaya* assists *jiva* and *pudgala* to assume rest position. Its other characteristics are similar to *dharma*. It is also a single, indivisible and homogeneous continuum pervading the entire *loka* but does not extend beyond it (it is also a cause for finiteness of *loka*). It is beginning less, eternal, devoid of sense qualities and imperceptible to the sense organs and physical instruments. It is immobile and assists *jiva* and *pudgala* passively in assuming rest position. It does not stop moving *jiva* and *pudgala* but becomes a passive agent in retarding and stopping their movement just like a shade of tree prompts a traveling passenger to stop. An object reversing its direction stops momentarily before changing the direction and such turn is also assisted by *adharmastikaya*. The still positions of body, concentration of mind, silence, staying motionless and all still postures etc., are due to passive action of *adharmastikaya*.

There are two main reasons for assuming the existence of *Dharma* and *adharmastikaya*

- 1 Assist *jiva* and *pudgala* in the act of motion and rest.
- 2 Division of *akasa* into *lokakasa*, cosmic space, and *alokakasa*, trans-cosmic space.

We believe that there is a cause for every action. *Jiva* and *pudgala* move, stop and travel throughout the cosmic space on their own. But an agent is required to help the act of motion (or stoppage) such that it itself is motionless and is present everywhere in the cosmic space. In the absence of this agent motion is not possible. *Dharma* and *adharmastikaya* are present in the *loka* only and therefore *jiva* and *pudgala* cannot cross over to trans- cosmic space. The liberated soul has infinite vitality but cannot go beyond *loka* for the same reason.

The *loka* maintains its finite shape because of *dharma* and *adharmastikaya*. In the absence of *dharma* and *adharmastikaya* the matter may either spread out in the infinite *akasa* or may contract into a Big Crunch by the force of gravity, a fear often expressed by scientists, and the *loka* may lose its identity and existence. The *dharma* and *adharmastikaya*

are essential components of the scheme required for the existence and functioning of *loka*. The other essential components in the scheme are *akasa* and *kala* as described below.

### **9 Akasastikaya (Space)**

*Akasastikaya* is a real substance. It is the container of all other substances, stationary or moving. It is boundless / infinite, eternal and one indivisible unit. It is non physical and so does not possess the qualities of touch, taste, smell and colour. The part of *akasa* which is occupied by other substances is called *loka* (cosmos). *Loka* is finite and is surrounded in all direction by *aloka* which is inert, empty pure boundless space. Beyond *loka* there is no object – animate or inanimate. No *paramanu* or *Jiva* can cross the boundary and go beyond the limit of *loka*. The *dharma* and *adharmas* determine the boundary of the *lokaakasa* by their own finiteness and thus divide *akasastikaya* in two parts, *loka* and *aloka*.

*Dharma* and *adharmas* are mutually inter-penetrating and concomitant with *loka*. Their existence and influence do not extend beyond *loka*, but within the cosmos they are all-pervading and co-extensive. They have a unity of locality with diversity of functions. Without these two, the systematic structure of the cosmos would have been a chaos. *Akasa* has infinite *pradesa* and all other substances have innumerable *pradesa*.

### **10 Kala (Time)**

*Kala* possesses the characteristic of 'persistence – through – change' and, therefore, is a substance. Its existence is necessary to define the duration (continuity), change (modification), motion, newness and oldness of substances. Time by itself cannot cause a substance to exist, but continuity of existence implies duration in terms of time. Mutation or change of modes also cannot be conceived without time, because change implies temporal succession in which modification takes place. Similarly, motion implies different positions of an object in space in temporal succession. Lastly, time causes the distinction between the old and the new, the 'before' and the 'after'. *Kala* is not *astikaya* i.e. it does not have spatial extension. Only the 'present' mode of *kala* is in

existence, the 'past' has expired and the 'future' is yet to come. The singular present' *kala* cannot have spatial extension.

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*Kala* is of two types – the absolute *kala* and conventional *kala*. The absolute *kala* assist modification/ change in substance and the conventional *kala* measures the duration of change. The Svetambara and Digambara traditions differ in the interpretation of absolute *kala*. According to Svetambara view since the absolute *kala* assists the substances like *jiva* – and *pudgala* in their modification it should be an attribute of the substance it is assisting. Thus the need of a separate substance like absolute *kala* is dispensed with. The Digambara concept of absolute *kala* is very different. According to this view the absolute *kala* is in the form of *kalanus* (*paramanus* of *kala*) which are placed one each on each *pradesa* of *loka*. The *kalanus* are separated from each other and therefore there is no spatial extension. The number of *kalanus* is equal to the number of *pradesa* (innumerable) in the *loka*. A *kalanu* assists the substances present on its *pradesa* in their modification. *kalanu* itself being a substance follows the rule of origination – cessation - permanence. The concept of conventional *kala* is same in the two traditions. The smallest indivisible unit of conventional *Kala* is 'samaya'. One 'samaya' is the time taken by a paramanu moving at a medium pace to go from one *akasa pradesa* to the adjoining *pradesa*. All other units of conventional *kala* are multiples of 'samaya'. These practical units of conventional *kala* are based on the movement of sun and moon. *Ghari, muhurt*, month and year are some practical time units described in Jain philosophy. According to Jain philosophy the motion of sun and moon is observed in a limited part of middle *loka* and therefore the conventional time is defined in that region only. The standards of conventional time so obtained are used for measurement of intervals of duration in other regions of *loka*.

## **11 Comparison of Jaina Concepts of Intangible Substances and Scientific concepts**

*Akasa* of Jains is a substance which accommodates all other substances, stationary or moving. So all objects, including light particles, move in it, *Akasa* is non material, one indivisible unit having infinite *pradesa*. Its *pradesa* do not move like the

particles of fluids and therefore, *akasa* provides a solid like continuum (at least for *paramanus* & *varganas*) in which transverse waves can travel. Thus *akasa* is the medium of propagation for light, were it photons or waves. The travel of light, however, like any other movement, requires the passive assistance of *dharma*. The *akasa* does not become an effective medium of propagation in the absence of *dharma*. The presence of any other substance like ether is not necessary in Jain scheme. The *akasa*, *dharma* and *adharmas* being non-material fulfill the needs of travel of both *jiva* and *padgala*. *Dharma* and *adharmas* must also be solid like substances so that their *pradesas* do not move, they superimpose on *akasa pradesa* in one-to-one manner. Both are present in *loka* and have the same shape as *lokakasa*.

The space of Newton is similar to *akasa* in some respects. Both are independent objective realities which are immobile and indivisibly whole entities. The Newton's space is void and requires the presence of ether but *akasa* does not need it to be a medium for propagation of light.

The time defined by Newton appears to be a fact rather than a substance. It measures the intervals of time like the conventional *kala* of Jains. Newton did not accept any limit on the velocity of light thus denying an inter relationship between space and time. According to the Jain philosophy also speeds higher than velocity of light are possible as happens in the case of *paramanu* and some *varganas*.

The Einstein's theory of relativity surmises that all speeds are relative and that the absolute velocity of any object can not be determined by any means. This generally is interpreted to mean that absolute space does not exist. If this is true then the Jain concept of *akasa* does not agree with the theory of relativity. But before coming to such a conclusion we must ascertain that the impossibility of determining the absolute velocity is due to subjective limitation of the observer or is it a real impossibility. If it is by limitation of the observer then existence of the absolute speed can not be denied. In view of Jain philosophy such a limitation is indeed due to the observer. An omniscient observer perceives the substances in their absolute state as he does not face the

limitations imposed by physical sense organs. He can perceive the absolute velocity and the absolute space.

Werner Heisenberg clarifying the above situation said that the ether which was a requirement of Maxwell's equation has been disapproved by theory of relativity. This is sometimes interpreted to mean that there is no absolute space. But one must be careful in accepting such a statement. Although Heisenberg did not clearly accept the existence of independent immobile space but he did accept that rejection of ether does not imply rejection of absolute space. He also posed questions to critiques of theory of relativity. According to these critiques "the special theory of relativity in no way establishes the non-existence of absolute space and time. This theory only says that absolute space and time do not participate in common experiments. But if appropriate time standards are used in this theory, there may be no objection to acceptance of absolute space." The critiques of relativity theory may also say – "we hope that future advancements in standards will enable us to clearly define the absolute space... and then we shall be able to oppose the special theory of relativity." Thus it is seen that denial of the existence of absolute space on the basis of special theory of relativity may prove wrong.

Let us consider now the four dimensional continuum of space and time. It is difficult to comprehend the exact meaning of this concept. Clearly, it shall be wrong to say that four dimensional continuum means that time is one dimension of space. The Jain philosophy is very clear in this regard. If *pudgala*, *akasa* and *kala* are treated as separate entities then there is no objection to the theory of general relativity. Jain philosophy also supports that gravitation and other effects produced by matter are also material entities. So all changes in space due to matter are also matter and have no connection with the space.

Let us look at the doctrine of space propounded by Bertrand Russell. Concluding a philosophical proposition he writes – "in this way there are two kinds of space – one relative space and other absolute space. The first is known by our experience and the second is imagined or postulated. But this makes no difference in our ability to perceive space and the things like colour, sound etc. All of these are expressed by cause and

effect principle and experienced by us. Our knowledge of space can not be different from our knowledge of colour, sound and smell." The two kinds of space mentioned by Russell can be called perceptual space and conceptual space. The *akasa* is the conceptual space of Russell and scientists are concerned with the perceptual space. But existence of perceptual space depends on the conceptual space. Thus it is seen that the concept of *akasa* is not only supported by the theory of relativity but is also logical. The *lokakasa* is the perceptual space or simply space considered by scientists. This space contains matter and its effects like gravitation etc.

A final note on the role of four intangible substances is in order. The non-physical substances *dharma*, *adharma*, *akasa* and *kala* are four essential components of the scheme of *loka* which also contains the other two physical components, soul and matter. The actions and functions of the physical components are possible due to the existence of the four non-physical components. The intangible substances in fact provide a stage on which the physical actors, soul and matter, act and play. And for this act and play to take place no other thing except the six substances is required, that is, there is no need to presume the existence of any super power like God to create the stage and guide, control and prompt the actors in their play. The souls are self-motivated; they guide and control their own course, under the influence of *pudgala*, on the stage provided by the four intangibles, without any obligation. All the six substances are infinitely powerful and maintain their individual and distinct identity and existence; mutual cooperation among them makes the *loka* a coherent, purposeful and meaningful place where we experience the consciousness that guides our daily life and future.