

# The Entropy Created the Space Points, Atoms, the Physical Time the Way these are, At Least on Psychological Point of View. The Entropy Can Answer - Why has Our Reasoning Gone So Sadly Astray?

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**Abstract:** According to the second law of thermodynamics, the entropy increases with time. If we assume that it is correct, it implies that there was very very special state of equilibrium during the Big Bang where everything was in super balance state and entropy was absolute zero. Since the evidences tell us that there is unidirectional flow of time after Big Bang, the entropy starts its journey just after the Big Bang and ever growing since Big Bang to till date. Since it is  $1.4 \times 10^{10}$  years now since the Big Bang, the entropy must be a giant by now. The entropy started generating inequality (after Big Bang) to the super equilibrium state of the Universe during the Big Bang. Thus all smoothly evenly equilibrium in the early Universe transformed into coarse-graining regions of local area of isolations. The tiny little local area of isolation formed is the atom where almost all the dealings are done within the atom, all the forces work within the atom and minimum interactions outside the atom. Every atom is almost an isolated local area. The entropy also generated inequality within the atom making protons and neutrons strongly bonded in a tiny space in the center (the nucleus) and almost massless electrons in a vast vacant place outside the nucleus. This inequality in mass put the electrons in motion around the nucleus which we call motion due to strong nuclear force. A good resemblance is like the nucleus is the king of the kingdom (atom) and electrons are the servants. The mighty power the nucleus has its own mass (just like wealth of a king). Motion is nothing but an illusion. The motion is nothing but a strong vibration of massless particles due to the supermassive particle in the center of a local area of isolation. The strong nuclear force is nothing but miniature gravity within the atom. The similarity between the strong nuclear force and the gravity is that both exist due to mass. The massless particles (electron for atom and planets for solar system – a comparative study with respect to supermassive center) set in motion around the supermassive center (nucleus for atom and the Sun for solar system). One of the key differences in motion in an atom and in solar system is the difference between overall mass in both systems. The more massive is the thing, the more its momentum for same speed, the better accuracy with dynamical (Newton's law) laws. That is why Black Holes have tends to Infinite mass and tends to zero speed to keep momentum finite (conservation of momentum). The motion of electrons could not be predicted accurately because the state variables of the local area (atom) could not be fully understood till date. Nothing is random, everything is deterministic as past and future are both preserved and protected by the physical time. Past and future are the flipped side of the same coin. Because past is fully unaltered, so is the future. Past is definite for us because we can interact with it to get the information and future is probabilistic because we cannot interact with it to extract information. But it is just psychological limitation only. Nothing has to do with definite or probability for the physical time. Life = the past (definite) + the future (probabilistic). But life itself becomes definite past after death or whatever. Thus life is definite. So is the future. It implies that everything is definite and deterministic such as electron motion, randomness etc. It also condemns the uncertainty principle. Because everything is predefined by the physical time (such as life), well defined by the physical time (such as past), thus no scope is there for probability, uncertainty, and randomness. These might not make sense for psychology but it has nothing to do or rather minimum to do with psychology for the physical time.

**Keywords:** The physical time, conservation of momentum, smoothly evenly equilibrium, coarse-graining regions of local area of isolation, the second law of thermodynamics

## 1. Introduction

According to the second law of thermodynamics, entropy increases with time [1, 2]. So, the Big Bang Universe was in a super uniform and balance state that is assumed by the second law of thermodynamics with absolute zero entropy [3, 4]. The entropy was a necessary and sufficient condition to put the Universe set in motion to strive for equality. There is always in-built inequality to set the Universe in motion to strive for equality [5]. Like we maintain a potential difference in a circuit to put the free electrons in motion and strive for equal potential in the both terminals of the circuit [6, 7]. Otherwise the electrons generally have drift velocity which is slower than a snail [8, 9]. But electric potential difference made electrons to set in motion to close to the

light speed [10, 11]. There is also biological evolution of brain with more developed brain for the next generation, the more developed brain is necessary and sufficient condition which indicates positive inequality to run the society so that a better ability of the next generation can beat the huge experience of previous generation. Thus society is in psychological motion. Nature loves to hide and nature loves to be mystic [12, 13]. Thus the inequality is nonlinear so that future cannot be predicted with good accuracy which set the human beings in psychological motion to reveal the nature of the nature and solve the mystery. Thus we strive for more knowledge, no matter how much we effort, still there is always a lot of work to be done to reveal nature which is a never ending quest for human beings because of the in-built mystery of nature. The nature will keep alive the natural

Volume 5 Issue 11, November 2016

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selection to keep its mystic nature and mystery so that future can never be predicted with good accuracy. The natural selection does not depend on human reasoning like normal reasoning of human being is that if you have excellent interview, you should get a job but natural selection might be that because a person have strong political hold to get the job even if he has worst interview. Natural selection will keep alive the non-linearity and push the wrong people to hold very sensitive post like professors or associate professors even if he is not sure what to use –whether I does that or I did that or I do that, which a nursery student can tell with great accuracy. Even he is in total confusion about which one is correct; still natural selection favors him to be a leader at least in a local area of isolation. Thus natural selection is a necessary and sufficient condition to keep the nature nonlinear, least predictive and mystic at least within psychological arena of human beings. We can never have complete idea of mystic nature because we deal with the nature with conscious mind only which is less than half of the total mind [14, 15]. We have some vague idea of the subconscious mind and we have no idea of the unconscious mind [16], with this kind of mind ability, one should have no choice but to be pessimist about revealing the total mystery of nature. That is the reason that our reasoning about the nature has gone so sadly astray. No matter how much you try, you will be end up with deficit only.

## 2. On the Space, Atom and Physical time

An atom isolates the other atoms in a nonlinear way to keep it mystery and to preserve its own territory. A space point isolates other space points in a nonlinear way to keep its own identity preserved and to keep the distant effect minimum with nonlinearity. That is why gravity is inversely proportional to the square of the distance and not simply distance only. Inversely proportional comes into play because of the isolation, effectiveness (of gravity of other atom) gets reduced due to the isolation between space points and between atoms. The square term comes into play due to nonlinear isolation nature of atoms and space points. The dynamic (Newton's) famous equation is-

$$F = G \frac{m_1 m_2}{d^2}$$

Where  $F$  is the gravitational force between two masses.

$m_1$  and  $m_2$  are the two masses.

$d$  is the straight line distance between the masses.

$G$  is gravitational constant

Because of nonlinear isolation of space points and atoms, the gravitational force  $F$  can be predicted fairly accurately with the nonlinear distance  $d^2$  term. There is a critical mass  $m_c$  above which Newton's law holds good. And because electrons and nucleus is below the critical mass  $m_c$ , this theory does not hold good and interference comes into play. Thus the gravity  $G$  can be termed as massive gravity [17, 18]. Miniature gravity of atom (strong nuclear force) is an underperformed gravity at least dynamical laws point of view [19, 20]. Similarly the physical time instants also isolates each other, thus, the more distant time instants, the

gloomy is the memory. The nearer the time instant, the better is the visibility of memory [21, 22]. Same thing holds true for the future too. The future time instants also isolate each other as the past time instants do. Thus we can have better guess about the very near time instants like driving a car on a road to guess the smoothness of the road. The guess become nonlinearly obscure at a distant future as we have no idea of the road smoothness that will come after half an hour. Because of the physical time isolation set by the entropy as it did with space points and atoms, future is not a linear device. Thus, uncertainty comes into play with psychology [23]. The entropy made the memory also a nonlinear device with local isolation, the reason why, at times, distant time instants can be remembered and more recent time instants are forgotten. Thus natural selections come into play as to which time instants to be remembered and which one is to be forgotten. The entropy made the memory highly nonlinear as uneven distribution of conscious mind, less clear subconscious mind and total obscure unconscious mind, and entropy generates uncertainty of their operational procedures.

## 3. On The Newton's Gravity

More general form of dynamic law is that gravitational force is directly proportional to the ratio of square of mass to the square of straight distance between them [24, 25].

$$F \propto \frac{m^2}{d^2}$$

Where  $F$  is the gravitational force between two same masses.

$m$  is the mass.

$d$  is the straight line distance between the masses.

Thus the force is the ratio of two nonlinear quantities-which itself is highly nonlinear. These all nonlinearities are necessary and sufficient conditions for the Universe to be as it is behaving now. We do not have proper reasoning of the big question why the Universe is the way it is. Unless we have complete understanding of the Universe in totality, the why question will be always standing still.

## 4. On the Entropy

The entropy must be a state variable of the Universe. It can answer many things and can resolve many key questions. If we can know, the maximum limit of entropy of the Universe, if any, we can answer that whether time will reverse or not, the Universe will contract or not, there will be Big Crunch or not, what are additional properties of the physical time, what are the cycles of the physical time, what came before the Big Bang, what are the new ideas of the origins of the Universe, why the Universe in the expanding phase etc.

## 5. Conclusion

The entropy can be a state variable of the Universe because it can reveal many questions of the underlying mystery of the Universe. The entropy created off-balance in the super balanced early Universe. The entropy forces in-built

inequality into the system and set the system to motion to strive for equality. The entropy introduced nonlinearity into the system to strive for linearity for the system. The entropy created definite past and uncertain future at least on psychological point of view. The entropy created psychological divisions of mind- conscious, subconscious, unconscious mind. The entropy created coarse-grained regions in a tiny area in the Universe and rest of the almost total area is mass-less. The entropy created isolations among atoms, among space points and among time instants to have nonlinear effect which can be least predicted. Nature loves to hide, nature loves to be mystery. Nature uses a parameter called entropy to keep itself a mystery. The entropy introduces natural selection to facilitate lesser abilities in better positions. The entropy is opaque, nonlinear, highly distorted but an essential entity, necessary and sufficient condition to run the Universe the way it is. But till date, no proper reasoning for the question-why the Universe is the way it is. So, we keep the question why alive for future research on the Cosmos.

## 6. Acknowledgment

I am cordially grateful to **Dr. Aparna Nath**, Associate Professor and my PhD Guide, The department of Physics, National Institute of Technology, Agartala, India, for the epitome of inspiration and motivation to write this particular paper with perfection and accuracy. I am extremely thankful to her for all possible help she made to write this paper. Also I am thankful to The Department of Physics of National Institute Of Technology Agartala (NIT Agartala) for proper conduct and coordination.

## References

- [1] Roger Penrose, "Cycles of Time", Vintage Books, London, pp. 50-56.
- [2] Stephen Hawking, "A Briefer History of Time", Bantam Books, London, pp. 1-49.
- [3] Stephen Hawking, "Black holes and Baby Universes and other essays", Bantam Press, London 2013, ISBN 978-0-553-40663-4
- [4] Stephen Hawking, "The Grand Design", Bantam Books, London 2011
- [5] Stephen Hawking, "A Brief History of Time", Bantam Books, London 2011, pp. 156-157. ISBN-978-0-553-10953-5
- [6] Stephen Hawking, "The Universe in a Nutshell", Bantam Press, London 2013, pp. 58-61, 63, 82-85, 90-94, 99, 196. ISBN 0-553-80202-X
- [7] Stephen Hawking, "The Beginning of Time", A Lecture.
- [8] Stephen Hawking, "Stephen Hawking's Universe: Strange Stuff Explained", PBS site on imaginary time.
- [9] Gerald D. Mahan, "Many-Particle Physics", Third Edition, Springer, 2000
- [10] Uno Ingard, K "Fundamental of Waves & oscillations", Cambridge University Press. P. 38, ISBN-0-521-33957-X Oxford: The British Academy, 1999
- [11] A. Zee, "Quantum Field Theory in a Nutshell", Princeton University Press, 2003
- [12] Storrs McCall, "A Model of the Universe", Oxford: Clarendon Press, 1994

- [13] Craig Callender, "Time, Reality and Experience", Cambridge, UK: Cambridge University Press.
- [14] Craig Callender, "Thermodynamic Asymmetry in Time", The Stanford Encyclopedia of Philosophy (Spring 2002 Edition)
- [15] Storrs McCall, "A Model of the Universe", Oxford: Clarendon Press, 1994
- [16] Robin Le Poidevin and Murray McBeath, "The Philosophy of Time" Oxford: Oxford University Press, 1993
- [17] Newton-Smith, W.H., "The Structure of Time". London: Routledge & Kegan Paul, 1980.
- [18] Barry Dainton, "Time and Space", Ithaca: McGill-Queen's University Press, 2001
- [19] Robin Le Poidevin, "Questions of Time and Tense", Oxford: Oxford University Press, 1998.
- [20] Nerlich, Graham, "What Spacetime Explains". Cambridge: Cambridge University Press, 1994.
- [21] Sklar, Lawrence, "Space, Time, and Space-time". CA: University of California Press, 1974.
- [22] Whitrow, G., "The Natural Philosophy of Time". Oxford: Oxford University Press, 1961. (2nd edn., 1980.)
- [23] Smart, J. J. C., "Problems of Space and Time". London: Macmillan, 1964
- [24] Stephen Hawking, "A stubbornly persistent illusion-The essential scientific works of Albert Einstein", Running Press Book Publishers, Philadelphia, London 2011.
- [25] William L. Craig, "Time and the Metaphysics of Relativity", Dordrecht: Kluwer Academic Publisher, 2001

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