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Marxism In The Light Of Philosophy of the Modern Physics.

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Abstract: Marxism is based on Newton's law of motion by physics and Darwinism by biology. After Marx there are tremendous changes in physics, those are relativity theory and quantum mechanics, which changed the old classical theories completely reverse. Modern physics consists of time and space, quantum physics and interpretation of quantum physics that is Quantum non-locality. These subjects are not taken in to account with the previous philosophies. Neo -Marxists explain and interpret Marxism only in classical way. Nevertheless, comprehension in modern physics completely changed the perspectives about universe and hence, there is an imperative need to revise Marxism in light of modern physics. It is necessary to include modern physics through first hand observations, investigations and interpretations in any form of primary research. Whereas it is also equally important to consider philosophical, political and sociological implications of modern physics. As have updated classical physics into modern physics, there is a need to update classical philosophy into modern philosophy that necessitates modernization of religions. The purpose is to interface the concepts of the two chief theories of modern physics, which presents a different picture of the concepts of space, time, and matter from that presented by classical physics and philosophy. The philosophical implications of modern physics are to be considered. Classical Marxism can be transformed into Modern Marxism to solve social, economical, political and environmental issues that we face today. There is going to be neither peace nor prosperity for mankind as long as the earth remains divided into so many independent states, until some kind of international system is created. As Lenin told "Society sometimes needs "push" aiming for real universalism". Modern Marxism can bring a democratic, non violent, organization with real class consciousness.
The humanity faces a crucial choice in the new millennium.Either we continue our present patterns of life, within the present institutions that secure today's huge and growing concentration of power at all levels and the consequent continuous deepening of the present multidimensional crisis, or,alternatively, we start building a new left political movement imbibing the newer scientific & economic developments that would involve the creation of institutions for a sustainable Inclusive Democracy, i.e. we embark on a process which would create the preconditions for the establishment, for the first time in history, of a new and truly democratic World Order.

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I. INTRODUCTION

Marxism is based on Newton's law of motion by physics and Darwinism by biology. After Marx there are tremendous changes in physics, those are relativity theory and quantum mechanics, which changed the old classical theories completely reverse. Modern physics consists of time and space, quantum physics and interpretation of quantum physics that is Quantum non-locality. These subjects are not taken in to account with the previous philosophies. Neo -Marxists explain and interpret Marxism only in classical way. Nevertheless, comprehension in modern physics completely changed the perspectives about universe and hence, there is an imperative need to revise Marxism in light of modern physics. It is necessary to include modern physics through first hand observations, investigations and interpretations in any form of primary research. Whereas it is also equally important to consider philosophical, political and sociological implications of modern physics. As have updated classical physics into modern physics, there is a need to update classical philosophy into modern philosophy that necessitates modernization of religions.

II. CLASSICAL PHYSICS AND THE ENLIGHTENMENT

We are all familiar with the way the Universe is organized and how it works. For most of us, the understanding stems from our school education, and mostly it originates in the Newtonian Mechanics Perspective of how everything around us is structured. It is also called Classical Physics. In the Newtonian world view, everything is one vast machine or mechanism made up of matter and energy. This machine is entirely deterministic which means that if you knew the speed and position of every piece of matter in the universe you would know its entire future — just as if you knew the speed and position of the balls on a billiard

table, you could calculate where they will all end up. Everything happens (time moves forward) in a three dimensional space. Consciousness and mind have absolutely no place in this model.

As per the Newtonian Mechanics Perspective, everything is predictable. If you know about the parts, you can know about the Whole. Logic and mathematics can explain everything. If you have understood how the most basic processes in the universe works, you can make prediction about the bigger events. The world is made of matter and the forces acting on them. The matter can be divided into smaller particles up to the level of atoms and subatomic particles. All the particles and the matter made up of those particles (from very small to the largest celestial bodies) follow the same classical physics' laws. The reality is what you can perceive, or manage to perceive through your five sensory channels. If anything is beyond this level of perception, it does not simply exist.

In the seventeenth and eighteenth centuries science and rational thinking began to challenge superstition and appeals to religious authority.Some thinkers, particularly in France, saw no need even for God, and for the first time in the history of Christendom atheism became a respectable alternative. The main objection to the clockwork universe was the implication that humans, as mechanical bodies themselves, do not possess free will. This meant that we are not responsible for our actions. Not only did this contradict the central religious doctrines of sin and atonement, it posed real problems for secular society. If a person is not responsible for his acts, what basis is there for punishing or rewarding him for those acts? Besides, most people have the innate conviction that they possess the freedom to act self-consciously no matter what scientists or philosophers may say.

Evolution completely contradicts the biblical story of the origin of life and on the Origin of species triggered a protracted war between science and those who insist the Bible is the literal word of God. That war has continued unabated to the current day. A rational dialogue between science and Bible-literal religion is probably impossible, since each proceed from a different presupposition. Scientists presuppose that the Scientific method of objective observation and logical or mathematical model building is the best and perhaps only way to arrive at useful information about the world.

Fundamentalists presuppose that their scriptures are divinely inspired and so must not be questioned. If they contradict science, then science is wrong and must be proven so at any cost.

Analyzed from the point of history, 'Renaissance' means the love, eagerness and interest, which were shown towards philosophy, science, art and literature in fifteenth century A.D. In medieval times, the church regulated education and directed its influence upon the society. When human mind wanted to be free from that bondage and welcomed new light, renaissance of events took place. In fact, the renaissance had created humanism in man and increased the desire in men to know more and more. Eventually renaissance galvanized the development in the field of philosophy, literature, art and science resulting illumination of the world with new knowledge. In medieval times, the church regulated education and directed its influence upon the society. When human mind wanted to be free from that bondage and welcomed new light, renaissance of events took place. In fact, the renaissance had created humanism in man and increased the desire in men to know more and more. Eventually renaissance galvanized the development in the field of philosophy, literature, art and science resulting illumination of the world with new knowledge. In politics, the democratic political theory came in to practice after French Revolution, and influenced by western philosophy, which resulted later as Marxism and made major changes in this world.

III. MODERN PHYSICS

"A new scientific truth does not triumph by convincing its opponents and making them see the light, but rather because its opponents eventually die, and a new generation grows up that is familiar with it."
― Max Planck,

Quantum physics is the study of the behavior of matter and energy at the molecular, atomic, nuclear, and even smaller microscopic levels. "Quantum" comes from the Latin meaning "how much." It refers to the discrete units of matter and energy that are predicted by and observed in quantum physics. Even space and time, which appear to be extremely continuous, have smallest possible values. The term modern physics generally refers to the study of those facts and theories developed in this century that concern the ultimate structure and interactions of matter, space and time.

The first major step toward a deeper understanding of the nature of space and time measurements was due to Albert Einstein, whose special theory of relativity (1905) resolved the inconsistency between mechanics and electromagnetism by showing, among other things, that Newtonian mechanics is only a first approximation to a more general set of mechanical laws; the approximation is, however, extremely the speed of light. Among the important results obtained by Einstein was the equivalence of mass and energy, expressed in the famous equation $E = mc^2$. From a logical standpoint, special relativity lies this time, Einstein also applied the quantum hypothesis to photons in an explanation of the photoelectric effect. This hypothesis was found to be consistent with special relativity. Einstein's General Theory of Relativity was revolutionary at the time that he wrote

it. A few years before Einstein wrote his General Theory of Relativity, he devised the Special Theory of Relativity, which was equally astounding.

The field of quantum mechanics started as early as the middle of the nineteenth century when physicist Gustav Kirchhoff showed that the emitted energy of a blackbody depends solely on the temperature and the frequency of the emitted energy. The blackbody is a concept in physics and is known as both a perfect absorber and a perfect emitter in the sense that it absorbs or emits all the energy. Kirchhoff demonstrated that the emitted energy is dependent on these two quantities however, he was not successful in correctly formulating the blackbody energy emission rate. Hence, he set a challenge to all physicists to find the correct formulae for the emitted blackbody energy.

Over the coming years there were several attempts to tackle the blackbody problem, many of which turned out to be incomplete, until the problem was finally solved by Max Planck in 1900. Amazingly, as soon as Planck discovered the problem it was only a matter of hours before he derived the correct formulae for blackbody emission.

While his deduction was triggered by an ingenious conjecture, he remained unsatisfied with his work and sought out an exact reason that would justify in theoretical terms the reason for his conjecture. In his workings, Planck made important assumption that energy is not continuous but rather discrete quantity. In particular, Planck stated that energy consists of quanta of energy.

Initially, Planck's explanation was not taken very seriously within physics. However, there was a physicist that became interested in the Planck's theory about the discreteness of energy and he went by name Albert Einstein. Einstein used Planck's idea to derive his seminal work on discrete properties of light, and in 1905, Einstein made very important realisation – if the light behaves as if it was made out of a quanta then perhaps it is also emitted and absorbed in that way.

Einstein used this realisation to describe the photoelectric effect. Thisquanta of the light – the light particle – is now known as photon. The main problem with his theory was that the theory of classical electrodynamics postulated that the light is a wave. It was counterintuitive to think that something can be both a particle and a wave. This led to the phenomenon that is now known as the wave-particle duality of light.

While Einstein's explanation of the photoelectric effect provided for testable predictions, it took ten years to design an experiment that could show that his predictions were correct and hence, in the meantime his quantisation did not receive widespread support. However,Einstein found another application for quantisation within the theory of specific heats. This use of the quantisation was soon supported by experiments and brought a broader audience to the quantisation debate. This eventually resulted in the Solvay Congress in1911 where similar ideas were mooted. Here, as the second youngest physicist at the conference, Einstein gave a talk on the specific heats and offered his insights on electromagnetic radiation.

The next stop for quantisation was the model of atom. Niels Bohr, in his doctoral studies, noticed inconsistencies in one of the theories trying to describe the model of atom – Rutherford's model. In Rutherford's model, the electrons circle around a dense core. Bohr's intuition led him to the idea of quantisation of the model. Bohr suggested that electrons circle the dense core in orbits and that for an electron to switch the orbits it must overcome a quanta of energy. Following the Bohr's result, Einstein successfully connected the Bohr's model with blackbody radiation. In the same paper, Einstein also postulated that the transition between the orbits cannot be determined precisely. In particular, he stated that the transition can only bedetermined probabilistically.

Bohr's model of atom allowed for a much more general quantum theory. Unfortunately, this task was not as simple as one might wish. While some parts of the model could be described classically, some could not be described that way. Continuous work on the theories with conjunction with Bohr's model resulted in the concepts known as the old quantum theory. The old quantum theory was simply a collection of results built around the Bohr's model of atom. The collection of the results was quite successful in explaining many experiments but suffered from inconsistencies and incompleteness. There was not a single failure as such rather a collection of little missing doubts. Moreover, the number of these doubts was overwhelming.

To overcome these obstacles and help better explain the assumptionsthat were used in the model of atom, Niels Bohr formulated the correspondence principle. Simply put, the principle states that for large systems the results of quantum theories must match the classical results. This simple principle based on the previous experience happened to be a very important building block of what is now known as the quantum mechanics.

The correspondence principle on itself was a positive start but it was not sufficient to help build a more consistent and more complete quantum theory. A group of theorists suspected that the assumption that electrons circle around a dense core in orbits might not be consistent with the rest of theory and hence, they tried to abstract from the orbits. The group eventually focused on the probabilistic transitions of the electrons in the atom core.

Two seemingly distinct quantum theories eventually made their appearance in 1925-1926. The first was offered by Heisenberg and took the approach of following the Bohr's correspondence principle to the

uttermost detail. The result was a theory that was counterintuitive on many levels. However, the theory managed to acquire several followers and hence, it was accepted by some.

While Heisenberg's theory was built around the revised Bohr's model and the absolute discreteness of the particles, the second theory was based on the wave-particle duality. Louis de Broglie proposed that if light may act as both a particle and a wave, then maybe electrons can act as both particles and waves. This idea, amongst others, led Erwin Schrödinger to formulate his own quantum theory.

Schrodinger thought about the discreteness of particles simply as if they were merely stable forms of continuous matter waves and built his theory around this intuition. The result was that there were two fundamentally different theories. Although the theories soon turned out to be mathematically equivalent, they still offered two fundamentally different explanations for their mathematics. To address this confusion, several modifications to the interpretations of both theories had to be made. Max Born changed the waves in the Schrodinger's theory to abstract probabilities of discrete particles occurring while Heisenberg postulated his uncertainty principle reducing the possibilities of even the things as fundamental as measurements.

Finally, Bohr's principle of complementarity that stated that the result of the experiment must be described in classical, not quan-tum terms made the interpretation into its more conventional form by Copenhagen interpretation of quantum mechanics.

Approximately a quarter of a century after the first Planck's realization into the quantisation, the theory as well as the interpretation for the quantum mechanics was ready. Many, including one of the pioneers of the quantum theory – Albert Einstein, found the resulting theory and the explanations for the theory insufficient and unsatisfactory.

The Einstein–Podolsky–Rosen paradox or the EPR paradox[1] of 1935 is a thought experiment in quantum mechanics with which Albert Einstein and his colleagues Boris Podolsky and Nathan Rosen (EPR) claimed to demonstrate that the wave function does not provide a complete description of physical reality, and hence that the Copenhagen interpretation is unsatisfactory; resolutions of the paradox have important implications for the interpretation of quantum mechanics.

The essence of the paradox is that particles can interact in such a way that it is possible to measure both their position and their momentum more accurately than Heisenberg's uncertainty principle allows, unless measuring one particle instantaneously affects the other to prevent this accuracy, which would involve information being transmitted faster than light as forbidden by the theory of relativity ("spooky action at a distance"). This consequence had not previously been noticed and seemed unreasonable at the time; the phenomenon involved is now known as quantum entanglement.

While EPR felt that the paradox showed that quantum theory was incomplete and should be extended with hidden variables, the usual modern resolution is to say that due to the common preparation of the two particles (for example the creation of an electron-positron pair from a photon) the property we want to measure has a well defined meaning only when analyzed for the whole system while the same property for the parts individually remains undefined. Therefore, if similar measurements are being performed on the two entangled subsystems, there will always be a correlation between the outcomes resulting in a well defined global outcome i.e. for both subsystems together. However, the outcomes for each subsystem separately at each repetition of the experiment will not be well defined or predictable. This correlation does not imply any action of the measurement of one particle on the measurement of the other; therefore it does not imply any form of action at a distance. This modern resolution eliminates the need for hidden variables, action at a distance or other structures introduced over time in order to explain the phenomenon.

Quantum physics has uncovered the aspects of physical reality at odds with our everyday sense of this reality resulting in emergence of amazing new fact of nature known as nonlocality. In contrary to the classical physics which insists that physical reality is local and that a point in space cannot influence another point beyond a relatively short distance, quantum concepts and experiments conducted with photons originated under certain conditions and travelled in opposite directions to detectors located about several miles apart, revealed the amazing fact that photons interacted or communicated with one another instantly or in no time. This is clear evidence to substantiate the concept of nonlocality disproving the EPR paradox.

IV. QUANTUM KEY IMPLICATIONS

1.There is no objective reality independent of an observer.
2.We live in a participatory universe. The observer affects what is observed by the mere act of observing.
3.Quantum entities exist in a multiplicity of simultaneous potential states (called a superposition), hovering in an abstract realm between existence and nonexistence prior to being observed.
4.There is no independent quantum entity separate from its properties. Its properties are a function of our observation. This is to say that these quantum entities aren't real in the way we ordinarily think of something as being real.

5.The act of observation is the very act which turns the potentiality of the quantum world into the actuality of the seemingly ordinary world.
6.Our act of observation not only changes the present state of the universe, it reaches backwards in time and changes what we can say about the past. This turns our conception of linear time and causality on its head.
7.The questions we ask make a difference.
8.The universe is a seamless, undivided and instantaneously interconnected whole. This is to say that each part of the universe is interrelated with every other part in an immediate and unmediated way.
9.An expression of this wholeness is the universe's non-locality, in which every part of the universe is related to and in communication with every other part. Our universe doesn't play by the typical rules of third-dimensional space and time.
10.Quantum entities can jump from one place to another without traversing the path in-between.
11.The laws of physics are not written in stone, but are mutable.
12.The quantum universe is not separate from consciousness; rather, it is an expression of consciousness. Mind and matter are no longer seen as separate.
13.Quantum physics literally changes and transforms our mind, as it introduces a new way of thinking. It also helps us see the world differently, which helps the world to manifest differently
14.Quantum physics is showing us how we ourselves are moment by moment playing a key role in the creation of our experience, as well as in the genesis of the cosmos, in this very moment
15.Significantly altering Descartes' famous principle, "I think therefore I am," quantum physics would instead say, "I choose therefore I am."
16.Quantum physics is a revelation in living form: it is showing us the dreamlike nature of our universe.

The condensed essence of quantum implications can be summarized as follows
Non Localism : Localism requires a cause and its effect occur at the same place, that there is no action at a distance. If an event A is the cause of another at B, there must be enough time between the two to allow a signal travelling at the speed of light from A to reach B. Any theory which has locality is called local.
Non Localism indicates an influence to pass between two systems or particles instantaneously, exceeding the limit set by the speed of light, so that a cause at one place can produce an immediate effect at some distant location. Any theory that allows non-locality is called non-local.
Causality : In classical physics, an effect can't occur before its cause. In the theory of relativity, causality means that an effect can not occur from a cause which is not in the back (past) light cone of that event. Similarly, a cause can not have an effect outside its front (future) light cone. These restrictions are consistent with the grounded belief (or assumption) that causal influences cannot travel faster than the speed of light and/or backwards in time. In quantum field theory, observables of events with a space like relationship, "elsewhere", have to commute, so the order of observations or measurements of such observables do not impact each other. To explain ; quantum events like gamma radiation can occur randomly without any physical cause which disproves the phenomenon of causality.
Indeterminisim: Quantum indeterminacy is the apparent necessary incompleteness in the description of a physical system, that has become one of the characteristics of the standard description of quantum physics. Indeterminacy in measurement was not an innovation of quantum mechanics, since it had been established early on by experimentalists that errors in measurement may lead to indeterminate outcomes. However, by the later half of the eighteenth century, measurement errors were well understood and it was known that they could either be reduced by better equipment or accounted for by statistical error models. In quantum mechanics, however, indeterminacy is of a much more fundamental nature, having nothing to do with errors or disturbance.
Observation and consciousness : In the Newtonian paradigm, there is a sharp dichotomy between the observer and the observed. Physical reality has its own nature and obeys its own laws, quite apart from what observers do, and even apart from whether there are observers. world changes much of this. The quantum observer stands inside his or her observations, which themselves play an active role in bringing about the very reality they then look at. In a sense not yet fully understood, the quantum observer helps to make the world of his or her observations. The unobserved world of quantum reality is a plethora of possibilities. All this possibility becomes an actuality only when the wave function collapses and whatever else may make the wave function collapse.

Mind and matter : The mind-body problem is a collection of interrelated problems and philosophical issues about consciousness, the self, free will, meaning, knowledge, our experience of time, and so on. The origin of consciousness can be studied by seeing what systems of the brain are affected when anesthetics lead to a loss of consciousness. Mind & matter function in synchronicity and cannot be looked upon as a separate entity.

Materialism and Idealism : Both materialism & idealism do exist and the question of primary or secondary in its existence does not arise owing to the fact that time, matter & space are interlinked and with interchangeable characteristics. This strongly implies that all forms of one thing.

Appearance and Reality : Modern physics gives us reason to believe that we can know some things about the objective, real world, but we cannot know everything, which results in a position called as "realistic realism." we can know more than mere appearances, and that we can know to some extent the way things really are.

Multiworld Theory: Quantum reality is described as a bizarre world of both/and. Cats are both alive and dead; photons and electrons are both waves and particles, both here and there, now and then. The many possibilities carried by quantum SUPERPOSITIONS are spread out over space and time. Yet we live, at the level of ordinary experience, in a world of either/or. We see waves or particles, live cats or dead cats, and so on. If quantum theory indicates that the atom is both decayed and not decayed, then the many worlds interpretation concludes that there must exist two universes: one in which the particle decayed and one in which it did not. The universe therefore branches off each and every time that a quantum event takes place, creating an infinite number of quantum universes. Many of the quantum postulates the possible existence of multi world concepts and needs to be empirically verified.

Future can change past : The possibility of future changing the past cannot be totally ignored. The concept of time travel, teleportation, "retrocausiality" are underway & yet to be proved. The theory of "retrocausiality" suggests that a particle can run backwards through time to the point where it is entangled and affects its partner that way.

The purpose is to interface the concepts of the two chief theories of modern physics, which presents a different picture of the concepts of space, time, and matter from that presented by classical physics and philosophy. The philosophical implications of modern physics are to be considered. Classical Marxism can be transformed into Modern Marxism to solve social, economical, political and environmental issues that we face today. There is going to be neither peace nor prosperity for mankind as long as the earth remains divided into so many independent states, until some kind of international system is created. As Lenin told "Society sometimes needs "push" aiming for real universalism". Modern Marxism can bring a democratic, non violent, organization with real class consciousness.

V. GLOBALIZATION AND NEW WORLD ORDER

It is a process which is far from being clear in its outlines, constant in its progression or uniform in its effects. It is characterized by the growing frequency, volume & interconnectedness of movements of ideas, materials, goods, information, pollution, money and people across national boundaries and between regions of the world ; shortening or abolishing the distance in time & space between events & places in the world with increased diffusion of standardized practices & protocols. It also encomprises the emergence of organisations, institutions & social movements for promoting, monitoring or counteracting global forces.

To achieve this movement of oneness encomprising all these ideologies & scientific facts a new world order is aimed at with the following aspects.

The necessity of a democratic and internationalist alternative to

- Neoliberal capitalist globalization.
- The necessity of realising equality between women and men.
- The necessity of deepening the crisis of legitimacy of the World Bank,
- The IMF, the WTO, the G7 and the big multinationals.
- Support for the cancellation of the Third World Debt and the abandonment of structural adjustment policies
- Support ending the deregulation of trade, opposition to certain uses of Genetically modified organisms and rejection of the current definition of Intellectual property rights in relation to trade ('TRIPS').
- Opposition to privatisations.
- Opposition to militarist policies.
- Support for the right of peoples to an endogenous development.
- Financing on the basis of the taxation of capital.
- Support for the rights of indigenous peoples.
- The necessity of agrarian reform and a generalised reduction of working hours.
- The promotion of democratic experiences like the participatory budget.

Integration of all the above mentioned aspects amalgamated with the newer social & economic approach will result in Universalism, internationalism or globalism evolving policies aiming for economic equality and national integration. The goal of universalism is to form

- A World Super State
- A World Legislator
- A World Parliament

- ❖ A World Police Force
- ❖ A Supreme Tribunal
- ❖ A Single World Currency
- ❖ A World Taxation System
- ❖ A Single Universal Auxiliary Language
- ❖ Establishment of a World Free Trade Area and

Finally, sustainable development and equal distribution are the action plan to be implemented worldwide to control all land, all water, all minerals, all plants, all animals, all construction, all means of production, all energy, all education, all information and all human beings in the world. The time has come to take up this task with enthusiasm and turn setbacks into new dimension to communism. The creation of such an organization will of course give an absolute guarantee of victory.

The humanity faces a crucial choice in the new millennium.Either we continue our present patterns of life, within the present institutions that secure today's huge and growing concentration of power at all levels and the consequent continuous deepening of the present multidimensional crisis, or,alternatively, we start building a new left political movement imbibing the newer scientific & economic developments that would involve the creation of institutions for a sustainable Inclusive Democracy, i.e. we embark on a process which would create the preconditions for the establishment, for the first time in history, of a new and truly democratic World Order.

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