THE INTEGRAL CONSTRUCT OF SCIENCE©

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ABSTRACT

We owe Chinese philosopher Tao Tzu an intricate and beautiful vision of our universe. The universe is seen as a seamless and unbroken movement and change, filled with bright objects, streams of particles, waves and eternal energy. Every observer is himself an integral function of the giant object. The universal object is never static, and none of its patterns of which we can take conceptual snapshots are real in the sense of being stable, even for the smallest duration imaginable. The majesty and beauty of our universe is undeniable. Physics is the endeavor that attempts to describe the behavior and structure of universal construct. Laws of physics are generalizations, with the intrinsic prospect that they can or cannot be preserved over our entire universe. Generalizations are not suitable to deal with complex matters, and at times are considered illogical; however they are commonly what the physics laws are. A number of general theories of physics provide a model for the fundamental rules that govern our universe, becoming a framework that the new discoveries must conform. The theory of relativity is such a general theory. The theory of relativity is a complex theoretical framework that facilitates the understanding of the universal laws of physics, but it is not the laws of physics by itself. It is based on the *curved space-time continuum abstract* concept, and it is well suited for interpreting cosmic events.[1] However, it is not well suited for handling of our contemporary scientific needs of the humanity, such as dealing with the global warming, energy harvesting, or the changes in our planet natural environment that we call pollution. More so, a general theory based mainly on abstract concepts and imagination can facilitate the emergence of countless new fancy theories that require an incredible large effort to validate them, even when we are headed in a wrong direction. Likely many of the new scientific theories are just theoretical fantasies that put science on a wrong path that induce the loss of large amount of scientific effort. My view is that a new simplified theory of the natural world is needed, a simple theory that provides a verifiable framework on which new discoveries can be made. Views of physicists, mathematicians, chemists, engineers and of course philosophers have to be all in harmony with such a theory. We leave in a beautiful, uniform, and logical world. We live in a world where everything probable is possible

INTRODUCTION

Human activity is universally justified by its essential obligation and endeavor for sustaining its existence; for preserving life. In search of efficiency, along with our human inability to tolerate un-described chaos, we are restless on sorting and ordering of diverse objects. As Freud noted, *"The benefits of order are incontestable - It enables men to use space and time to the best advantage".*

[1] Please see my article "The Verifiable Route to the Scientific Truth" that describes the consequences of adopting an abstract scientific framework and abandoning the factual truth in scientific discoveries.

The desired road to order is by adhering to principles such as simplification and efficiency. Primal actions such as counting, grouping, and classification of objects have assisted in the development of arithmetic, and geometry; they have aided in accomplished a unique attentiveness and facilitated the development of logical/rational awareness. Our minds require order with respect to spatial placement of objects, and of the sequence and duration of events; therefore substantiate the emergence of the concepts of time and spatial geometry. Scientific discoveries those are useful for humanity development. A scientist is an explorer of the unknown. We can distinguish the applied matters scientist who is preoccupied with the physical observation and techniques, and also the pure scientist who committed in solving scientific puzzles. The beauty and majesty of our universe is undeniable. Physics describes the behavior and structure of matter, and was for long time the focus of our inquiries. The beauty of the stunning *simplicity of the world* is revealed in the laws of physics. It is important and puzzling to mention that generalizations are many times illogical, and nerveless the laws of nature are in some way generalizations. We also must separate the legitimate scientific method from metaphysical speculations. More important to new solutions to the wonders of science, is to challenge and refute unfounded theories based on pre-conceptions. We all agree that progress is stagnated by the restless acceptance of useless dogmatic ideologies, and incredible amount of effort is wasted. Science itself it is a creative activity that in many respects resembles other activities of the human mind. It is a road to order, to simplification and efficiency. Scientific laws represent mathematical functional relationships between variable quantities. A scientist is a true explorer of the unknown. There are two varieties of scientists: applied scientists interested in gaining knowledge from empirical observations and techniques. And there is the pure scientist, he is committed to theoretical understanding of our world, and in some way his tasks are similar with that of solving puzzles. Since the epic theory of relativity many scientists have embarked in a pursuit of astonishing theoretical fantasies, abandoning the prudent and logical path to scientific inquiry. The theory of relativity is accepted as the work of an undisputable and worshiped genius; however it is so intricate that can not possible genuinely proved or denied. It stands along the great achievements of human mind; such as Mozart or Verdi music, wonderful literary works of Shakespeare, Dostoyevsky or Poe.

Following are some of my personal considerations in the attempt to understand our world. That led to a very simple view of the laws of physics, bellow.

- Matter moves in vacuum at constant speed. (perpetual)
- There is no change in the motion of matter without causation (acceleration and deceleration are due to external forces)
- Energy is preserved in vacuum. (speed)
- Matter singularly occupies its volume in space.
- Matter motion in a strait line, unless is impacted by external forces,

At first I like to share with the reader some of my observations regarding such matters as time, space, matter itself, radiation and light, gravitation, subjects that have preoccupied me for many years and are the basis of this paper. Later on in this paper I'll provide more detail on structure regarding the simplified reference construct regarding the laws of nature.

TIME CONSIDERATIONS

"Having a camp fire, it warms us at present time. As past, it was a pile of wood, and as future, it will become a pile of ash."

The concept of time has an intellectual origin and a necessity of our cognitive mental processes. Similar to the concepts such as the line, the point, the space abstractions, and it is indispensable for describing and ordering such quantities as duration and velocity. The concept of time is central in physics; also we can say that the concept of time is indispensable to understand

physics. Furthermore, various logical concepts such as cause/effect, permanent /momentary, past/present/future, action/no-action and the ordering of event emergence sequences required the development of the concept of time. Without the concept the time our logical system would break down. The perpetual sequential processing of sensations leads to understanding of present, past and future, therefore of the time sequences. Symbols of events are sequentially imprinted on our mental memory strip in a way that preserve the chronological order, in addition it also the impression length imprint does account also for such details as duration. The concept of time is connected to the self-constitution of our intuitive mental structures. The positioning of an object to another object is a mental process - our mind requires order with respect to spatial placement, sequence and duration of events, therefore time and geometry.

"*Space and time serve as indispensable tools that arrange and synthesize the images of the objects imported by our sensory organs"* - Pinhas Ben-Zvi

Remembering does imply the use of memory, and the use of the concept of importing past-time events to present-time. Aristotle once said: *"Only animals that perceive time remember"*. Although, a way to reconstruct this statement is that only the animals that remember thus have a mean of memory recollection, perceive time. Time does not exist otherwise; it is just a mental abstraction. Our cognitive structures deploy the indispensable concept tools such as time and space to order the images of the objects collected by our senses. The retention by the memory of sense data, also recollection, leads to understanding of present, past and future, therefore of the time sequences. The concept of time provides a sequencing order for the occurrence of random events, that also might have a duration (time bound) component. The random event could also be the outcome of some other random action, when a cause is present. We can say that the act of tossing a coin will necessarily produce an outcome; the outcome itself is random. For the chronological sequence of events the time-duration is not the essential component, but the ordering of the events to each other with regard to the order they are sensed. The first, second, third, or the last order of appearance or disappearance, sometimes also compounded with objects time-duration, and some other properties. Time – it is the concept of measurement and ordering of duration segments. Time is not duration itself, but duration is a fragment of time. Change implies duration, and change is provable. Also one can remember but can not experience the past. Present only exists, past is a recorded in memory object, and the future is generated by the inductive quality of our mind. *The present* in time is reminiscent of only a snapshot, as a photograph, frozen in time that encapsulates the concept of point in time.

Present-time objects are not required to be in a continuous sequence, but they do conform to the chronological form of ordering. For example talking is a metal process. The sequence of sound objects that form a thought symbol, a word, requires a sequential order, and that order also implies the concept of time. Music is also a mental object - music necessitate a relational sequence of tones; the later one does need the earlier one as a point of comparison, and change of tonality perception. There is a distinction between tone and melody. Also the human language requires the concept of metrical constraint and implies duration, and event ordering, therefore what we call time.

The time concept is not a human exclusive characteristic. Linguistic symbols such as dog barking, birds "singing", imply the concept of rhythm, duration, and event ordering; therefore time. The plants cycle of foliage, flowering, baring fruits happen in orderly sequences and not without meaningful purpose. The awareness of the concept of time is therefore obvious in plants existence.

Events as related to the concept of time

Some events are time-dependent; some are time-independent. Here is a simple classification.

Time-neutral event

- Probability of a coin toss. The experiment is done in time but the *time* itself is not related to the event outcome. (head or tail)

Time-bound event

- Theory of relativity e=mc2 does imply the energy is time dependent (c2 is velocity), at least in this relation. Distance = velocity * time. More so, acceleration – implies variable velocity and therefore variable duration for the same space. Both the concept of time and space are essential for defining it.

Time in Racing

- Time fixed and the outcome variable – basketball
- Time neutral – tennis
- Distance fixed, order primary, time component is secondary. – marathon, cycling
- Distance fixed and duration/order essential – 100 meters flat

Time classifications

Real-time

- Time required for speaking, for example.

General-time

- Writing – communicating in general time. For example: a note saying that "today is Monday" is valid only if indeed today is Monday. Or leaving a note on the friend's desk: "please call me". It is a message in general-time and dependent on the moment when our friend reads the note.

Imaginary time

- In imaginary time, when there is no beginning or end (eternity), contrary to the real-time where there is a beginning and end.

SPACE CONSIDERATIONS

The human eye provides a three dimensional "field of view" on which objects can be detected. The eye provided the brain the sense data with regard to the present existence of objects in that view. As the eyes move along with the human body, the "field of view" changes, and different sense data is presented to the brain. A "field of view" or a sequence of "field of views" defines for the human mind the initial notion of what we call now *space.* The "field of view" can detect objects of a limited spectrum of colors, and of large sizes; the eye can not detect, for example, the atomic structure of the objects. The "space" so detected by the eye, it is extended by the human cognitive prosesses, due to the over changing "field of views". A priori inductive reasoning does provide the understanding that the space is boundless or infinite. In this space the objects are singular and plural, closer or further from the point of detections. The objects are placed in particular locations in the "field of view", they have particular size and properties. The singular quantity is sometimes called "one" and the plural quantities are called, equivocally, "two", "three"

and so on. This is the root of the counting process, numbering, and it is the starting point of arithmetic. The displacement between objects is detected, and this displacement is called now "distance". The objects location in relation to each other was classified as near, close, far, up or down, and so on. Comparing with the human characteristics such as arm length, the footstep, and so on we started measuring the "distance".

Some of the objects detected in the "field of view" are irregular; some are liner, curved, spherical and so forth; as physical characteristic. The ordering of these object properties has generated some understanding of the external world and is the initial point of development of what we call now geometry. Objects that are approximate representations of geometric objects are abundantly found in nature. The initial development of arithmetic and geometry has greatly advanced, in time, by cognitive a priori processing. Therefore, we can argue that the empirical data presented to the human mind thru the senses organs, are the start point of our human understanding of space, time, mathematics, and of all scientific knowledge. We also can conclude that majority of animals do have sense datum accumulation capabilities and memory, and therefore they also have a notion of time, space, and even an initial form of arithmetic. Likely every species of animals perceive the world in some other way that we, the humans, do but nerveless they perceive it in a complex way, and this is seems to be an important observation.

Space is then an abstract concept that defines a geometrical volume where objects can be located. The geometrical concept itself is an induced abstraction. An object of space can be called *location*. Matter singularly occupies it's *location* in space.[2] Three dimensions are sufficient to represent all the existing space volume in the universe. The space can be envisioned as a sphere, and then only a center location and radius are needed for its representation. Curvature of space and time continuum is a complex mathematical representation of the space object, and not necessarily a characteristic of the space itself. Space and time can be seen as independent concurrent processes, with a relational element. The space itself has to be described as empty, factually a vacuum. That would suggest that the empty space is cold and dark, since no matter or energy is present. In other words, space is emptiness. The space object must be considered dynamic, as it is required to allow the Universe to expand. Therefore must be more space then the infinite universe. That tells that more space can be created or the universe itself can not be viewed as infinite unless we assume that matter itself can exist outside "space".

UNIVERSAL REFERENCE FRAME (URF)

A *Referential Frame* can be defined by the spatial context/the circumstances in which an event occurs; a setting.

First we define a Universal Reference Frame (URF), which encapsulates the space of the entire universe. The URF contains multiple independent and nested frames, named Local Action Frames (LAF). The LAF can also contain multiple LAFs, nested inside their space. In general the Local Action Frame (LAF) is the frame where the action is observed. All frames are nested to the URF.

A Reference Frame (observer) can be identified within one of these constructs:

Universal Reference Frame (URF) – Universal frame that encloses all possibly LAF frames.

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[2] Considering an airport I visualized the connection between time and space. The airport runaway can be considered the "location" in the airport "space", and then only one plane (mass object) can be at that one location at one given time. After a plane left the runaway then another plane can use it (same "location" in the airport space) on a disjoint segment of time. Commonly airports have multiple runaways, and multiple planes can occupies multiple runaways at the same point in time. This lead to my realization that "matter singularly occupies it's location in space", otherwise we have a "collision", a source of change in the universe.

Local Action Frame (LAF) – Local frame where the action is observed. Some Local Action Frames become statically bound to other LAFs, and then they become Local Action Inertial Frames of reference. (LAIF)

Some events are bounded to LAFs for brief duration and then are bound to the URF. In that case the motion is same from all reference frames. (as the light is assumed to be)

The Reference Frames are indispensable to define motion/rest, velocity, acceleration, location.

The state of rest, as contrary to motion, has it specific point of reference. For example a car which is in a state of rest nearby, it is also in a state of travel by the cosmic motion. All things are in motion and at rest, or both, with respect some disjoint points of reference and time.

ABOUT MATTER

The *Law of conservation of energy*[3] suggests that in nature nothing is gained or lost, all is a transformation. The impossibility of a logical justification for the creation of matter, since in our universe everything is a transformation, brings a real obstacle to its definition. Can matter be created? Is the transformation of *nothing* to something is even possible? Our current logical system does not allow for the possibility of the creation of matter, and the real question is the determination is the matter really exists or is just a form of energy. Matter can be seen as clustering of elementary particles (matter by themselves) by atomic bonding forces. Between any two particles there is an attraction force inversely proportional to the square of the distance between them, the gravitational force. There are also atomic and molecular bonding forces that have created large objects of matter, as it is what we can sense and are. Mass is property of matter, and all matter has mass. Nothing material exists that does not have mass and the mass interaction fields.

Particles of matter, interacting among each other, and traveling at high velocity are called *radiation*. Therefore, radiation can be accepted as a manifestation of matter. It is also now agreed that matter also exhibits wave characteristics, therefore matter is not an internally static object.[4]

Certain characteristics of matter can take only discrete values, and in that sense implies that only minimum amount of physical entity is involved in the interaction, and that is the subject of quantum inquiry of the subject.

It is puzzling to say, but *energy* and *matter* may possibly be the distinctive manifestation of the same phenomenon. The famous Einstein formula $e=mc^2$ equates energy and mass. (the c^2 is a number constant, it denotes proportionality and can be ignored)

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[3] *The law of conservation of mass* (Lavoisier) states *that the total energy is neither increased nor decreased in any process. Energy can be transformed from one form states that to another and transformed from one object to another; however the total amount remains constant.*

[4] The relationship, called the de *Broglie hypothesis*, holds for all types of matter: all matter exhibits properties of both particles and waves

It is assumed that the entire universe can be seen as an object of energy and matter. The matter is a mass object, and since we can equate the energy with mass we can assert that the universe is only matter.

ENERGY

Since the earlier described relation and the association of mass and energy, it is difficult (if not impossible) to define the mass and energy as separate entities. Is possible to consider energy when matter not is present? (Example: in vacuum) The matter itself is not a static object; it does inherently incorporate internal energy as necessary component of its construct. I refer to this energy as internal energy. (IE) Also matter objects are in perpetual motion[5] and that an additional component or energy, kinetic energy (KE), is added to the total energy of the object. As the matter objects travel in space occasionally they collide to other objects and the outcome is settled by what we call the *laws of nature*. There are changes to the matter objects, and the energy is re-distributed to the objects involved in the collision. Traveling in the empty space (described earlier as vacuum) the internal energy and the kinetic energies of an object are preserved.

The new energy received by the planet earth it is mainly from the sun. For example, the matter object from the sun that arrives to our planet (light radiation) travels in empty space until it collides with matter objects of our planet. A number of collisions and transfer of energy takes place in the atmosphere, part of the energy is transferred to the body our planet, and some energy is reflected away. Also energy from our planet dissipates by colliding to matter objects while traveling into the galactic space.

LIGHT

Gravity is what keeps matter in balance/together, light is what connects it.

An intricate representation of light propagation describes light as spherical pulses that propagate in all directions. The light is an electromagnetic radiation, and the light matter object is the photon. Light is the most abundant radiation in our universe. Besides the traveling light we sense, light is also stored part of the atomic structures.

Light moves at constant speed measured at 299792458 meters/second, and it is said to be the maximum velocity in the universe. That implies that it was generated during the creation of our universe, during the “big bang”, and it is traveling since.[6] Furthermore, it can provide insight of the rate of expansion of the universe *singularity* that has created the universe as we can sense it now. Since the light has wave properties, and the photon moves on a wavy pattern, the speed of light is not truly the speed of the photon, but it’s a linear displacement in space. That would imply that the photon itself possibly travels at higher speed that the so defined classical “speed of light”, an observation with immense scientific implications.

The matter particles that form light (photons) are subject to the attraction of gravitational forces.[7] However, given the small mass and high velocity of light it can not be easily detected.

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[5] Please see *The Absolute Laws of Matter* section of this paper.

[6] Since the *Law of Conservation* of matter mentioned earlier, also new light can not possibly be created.

[7] Since a *Black Hole* does not allow even the light to escape and that why it is “black”, it also implies that the light is influenced by a massive gravitational field.

In general, radiation is not sensed by our vision sensory organs.(eyes) Only a small spectrum of the electromagnetic radiation is examined by the human eye. The typical human eye will respond to radiation wavelengths from about 390 to 700 nm In terms of frequency, the spectrum of visible light. The spectrum does not, however, contain all the colors that the human eyes and brain can distinguish. Other colors and shades such as pink, violet, or grey are formed by a mix of multiple wavelengths. Since light is a electromagnetic radiation, it is just a flux of vibrating particles traveling in empty space. Many matter objects reflect light, and that allows us to sense objects and see colors, which make our world to look so beautiful. However, color itself does not exist in nature; our mental construct associates a light frequency with a certain color similar to how we associate a letter with a certain sound, a cognitive process. We can also distinctively visualize and sense a black object; but that is due to the absence of light radiation.

GRAVITATION

The gravitational forces are deeply mysterious, and a good opportunity for more scientific discovery.[8] Since Newton's wonderful work, was accept that between any two particles there is an attraction force inversely proportional to the square of the distance between them. Since the Universe itself is a non-homogenous object of matter, it contains clusters of matter that are separate from each other. We must consider the entire Universe gravitation, related to the mass of the entire Universe. However, the universal gravitation is not uniform; it is "disturbed" by local area of increased local gravitation such as the galaxies gravitation, stars gravitation, planes gravitation, and so on.

Besides the visually sensed scrutiny of our universe, large matter objects are supposed to exist, the famous "black holes". The gravity of the black hole is so intense that does not allow even the light to escape its space. That would justify that fact that it is "black", and we can not visually sense it. However, if the black hole objects exist, that also implies that the light is attracted by a gravitational field. Therefore, the light particles, as any other particle of matter, are reacting to gravitational forces.

The buoyancy in a liquid it is and interesting phenomena, and can be considered a form of simple anti-gravity. In a mass of fluid, an immersed mass object id affected by an upward force. (contrary to gravity) The net upward buoyancy force is equal to the magnitude of the weight of fluid displaced by the mass object; this is well known as the Archimedes principle[9] Furthermore, besides the liquids, also gases shows the buoyancy property as well, we all noticed helium filled balloons rise.

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[8] Electric forces between elementary matter particles form matter objects as liquids and solids. Furthermore, electric forces are also part of metabolic processes. I wonder is there is a relation between gravitation fields and electric fields, and if they are in any ways related.

[9] Archimedes' principle indicates that the upward buoyant force that is exerted on a body immersed in a fluid, whether fully or partially submerged, is equal to the weight of the fluid that the body displaces. Archimedes' principle is a law of physics fundamental to fluid mechanics.

EVENT

Evens cause the transformation of matter, and, at times, multiple events are logically connected. All events are deterministic, even if the view or the *frame of reference* for evaluating them is non-deterministic. Our universe can be viewed as a quantum object, however the laws of nature are preserved and that guarantees that the deterministic aspect is preserved.

Here is a simple event classification:

Primal event. (independent of any other)
Basic event; a collection of interconnected primal events.

[Status] Cause -> [Event]
[Event] Cause -> [Event]

The events necessary characteristic:

- No event occurs without cause
- Some events (such as collision) generate matter cluster changes

THE ABSOLUTE LAWS OF MATTER

1. Matter travels in vacuum at constant speed. (perpetual)
2. There is no change in the motion of matter without causation (acceleration and deceleration are due to external forces)
3. Energy is preserved in vacuum. (the internal and external energy)
4. Matter singularly occupies its volume in space.
5. Matter motion in a strait line, unless is impacted by external forces.

This is a straightforward structure that is based on simple concepts.

Matter travels in vacuum at constant speed. (perpetual)

This implies that matter motion is perpetual, and its characteristics are only disturbed by exterior forces. The initial matter motion can be described as generative of perpetual inertia. The initial generative inertial forces are inherent in our universal construct, and not generated by external events. External events do generate changes related to matter objects, and the matter motion and inertial velocity will also change during the events. The inertia velocity change will be related to the mass (energy) of the new matter object (IE) and the new velocity/kinetic energy (KE) of the matter object.[10]

There is no change in the motion of matter without causation (acceleration and deceleration are due to external forces)

[10] This is conforming to *Newton's Law of Inertia* that every matter object continues in its state of rest, or of uniform velocity in a strait line, as long as no other force acts on it.

Acceleration/deceleration event happens only while external forces are applied to a matter object. Acceleration is not perpetual or continues in the absence of the external action.

Energy is preserved in vacuum. (the internal and external energy)

No loss or gain of energy of mass object (both IE and KE) happens while the object is not interacting with other objects. That can be collision or interaction with any fields of matter. (electric field, magnetism, gravitation)

Matter singularly occupies its volume in space.

It is fact that multiple matter objects can not occupy the same location is space, at the same time.[11] It is the intricate time/space connection, and that induced my formal statement that *matter singularly occupies its volume in space*. When multiple matter objects attempt to occupy same location is space, at the same time, a collision event occurs. The kinetic energy of all objects is distributed among all participating matter objects proportional to their mass content. The collision outcome is settled but what we name the *laws of nature*. This is the main source of change in the universe.[12] This also will straightforwardly account for the emergence of matter reaction force and changes in the velocity of the matter motion.

Wolfgang Pauli forwarded his P*auli Exclusion Principle* for particle behavior, and Albert Einstein used the ultra complex abstract concept of *curved space-time continuum fabric,* based on the Minkowski's mathematical model, for representing the space/time and matter relationship.

UNIFORMITY IN NATURE

A certain degree of uniformity is easily observed in our world.[13] Furthermore, we live in a world where the probable is possible. The beautiful world developed as it is, simply because the transformation was possible. A quantum view of our world is valid since the world events are equally independent, and the outcome of these events can be predictable by statistical modeling. The fact that the universe is uniform is proved by the validity of observation. The valid correlation between the statistical/probabilistic modeling provided by mathematics is compared against the observation of natural world itself. The mathematical statistics modeling provides a proportional opportunity for all events, and the observation of our world satisfies the statistical model.

The question if we are part of the multi-verse can be satisfied by sensed observations that will not satisfy the mathematical modeling provided by statistics. Observations of events (let's say by the edge of the universe) that are peculiar to the usual patterns and show a statistical pattern inconsistent to the construct of a single/independent and uniform universe. Uncommon velocities, uncommon behavior of matter objects, and Creating of geometrical patters not consistent with the

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[11] *The airplane on a runaway, the car moving on a highway is a clear example of the principle. When a plane or a car attempts to use simultaneously same location to some other material object a collision occurs.*

[12] *Another source of change even can be the effect of attraction/rejection fields (electric, magnetic, gravitational), things that are related to matter in a way unknown to me.*

[13] We can observe that even smaller tasks, such as the mixing the sugar in our coffee, or the uniformity of new paint color after stirring paint of different colors will produce a surprising uniformity.

contrast of the Universe would be an indication of some external influence that is residing outside our universe construct.

There is continues change in our beautiful universe, a change where the probable events are possible.[14] That is accountable for emergence of our solar system, for our planet, and for the life on earth. What a wonder our world really is.

[14] Second Law of Thermodynamics. This says that the total amount of disorder, or entropy, in the universe, always increases with time. The “entropy” is a fancy word, but instead a more suitable word would be *change*. (not necessarily entropy)

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The following is a short list of the most important references that have influenced my thinking during the last years. The opinions on this text were inductively based on personal reflection when reading the named material. Additional data was gathered during the school years and from various other sources such as Internet, magazines, TV shows, etc.

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