

# Formulation of Unary Law of PicoPhysics

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1. Summary .....	1
2. Introduction.....	1
3. Unary Law .....	2
4. Unary Law Vs Fundamental Laws Of Physics.....	4
5. Picophysics – Unification Process.....	6
6. Success Story (Geometrical Properties Of Space).....	7
7. Digital Reality .....	7
8. Conclusion.....	8

### 1. **Summary**

*In this essay we describe the thought process which made us consider the fact 'Space contains Energy' as starting formulation of Unary law of Pico-Physics. An overview is provided on process of integrating the laws from contemporary physics into PicoPhysics. An overview is provided on integration of Geometrical properties of space into Unary Law.*

*In Picophysics we find answers to questions never asked before. To this end; an overview is provided of integrating geometrical properties of space into unary law. The scope of PicoPhysics encompasses understanding facts of nature whether identified in contemporary science or embedded in human psychology*

### 2. **Introduction**

Before 1975 the thought process in PicoPhysics was fragmented around Conservation & Energy, Inertia & Activity (Since dropped after formulation of Unary law), Formation of Matter, Inertia & Activity, and Properties of nucleus & extra-nuclear regions of material particles. The integration of the thought processes by Kambhar (An ether like concept) concept was weak.

By 1980 Unary Law was fully established in PicoPhysics. Many Universal Laws of science were considered to be candidate as Unary Law. These laws included; Laws on Invariance, Superposition & Conservation, Entropy, Uncertainty Principle & Schrödinger's equation. One of the problems with these fundamental laws with universal applicability was 'they were too abstract'. It was very difficult to orient a thought processes that could integrate the laws in other application areas with them. While for Law of Entropy it was only partly true, it could have provided us a common platform for change, while first law of thermodynamics answers creation in negative.

The problem with alternative dispensation based on laws of thermodynamics will still be absence of direct relationship to human observations, abstractness and dependence on concepts other than contained in the law itself.

Instead, the attention shifted to determine the highest common factor in human observations. It was felt that all observations are result of set of elementary interactions between objects (geometrically confined and isolated matter). Matter was already considered as another form of energy thanks to famous equation . We have already discounted the inter-convertibility between energy and mass. A letter to American Journal of Physics in 1970 was rejected with a question asking “Who are the scientists who believe conversion between mass and energy?” Thus Energy that is geometrically confined is present in all observations. The next stage was elaboration of geometrical confinement as contained in space.

### 3. **Unary Law**

The above thought process gave us the statement ‘Space contains Energy’. It was universally applicable, close to human perception and intuitively conclusive & deterministic. It was very attractive candidate to become Unary law statement.

***But to be termed a law, the statement has to be more than just being a fact or truth.***

The energy is already identified with conservation. It’s presence in the statement can be attributed to the concept of conservation.

***The concept of conservation in contemporary physics is weakened by neutralization.***

If matter is considered as form of energy, negative energy will hypothesize negative matter. Contemporary physics already has electron and positron as particle /antiparticle pair. But none of them has energy in negative. It was seen that the energy in Unary law may not share neutralization of contemporary conservation concept. So a modified concept Konservation evolve out of conservation. The Konservation concept imbibes confidence of PicoPhysics to explain nature with Unary law. This concept drives itself more from first law of thermodynamics – energy can never be created or destroyed. To improve the concept further, the development of science of arithmetic’s was analysed. Specially the concept of Infinte numbers. It gave more substantial (conclusive and deterministic) properties to Energy.

***The newly defined Energy with this conceptual leaning was termed Kenergy and incorporated into Unary Law.***

Space was harder to understand. It needs to be raised to a level where it can occupy significant position in Unary law. The first break came when we realized that intuitively we consider the Space to be more conserved than even energy. Energy can change forms and to an observer (capable to observing certain forms of energy only), it can prove to be not conserved. Space has no such luxury; it can not hide itself from observer. It exists. Further thoughts made us understand the space-conservation was secondary conservation – due to objects used to link different elements of Space were all composed of Kenergy – Konserved substance. With this realization, Space was conceptualized with Anti-Konservation. It can be created and destroyed. Quantifying creation and consumption of Space and setting up the mathematical formulation shall be included with the concepts embedded into Unary law or intuitively derived from it.

***Thus in Unary law, Space represents a reality that is Anti-Konserved, while Kenergy is Konserved.***

Initially, 'Kenergy exists' was considered as corollary to Unary law. This will confirm to human intuition that everything we observe exists in the space. We can go silent on the word 'Space' and 'contain' replacing them with Exists. "Exist" being conclusive, deterministic and assertive is better acceptable to human psychology. "Kenergy Exists" is still considered corollary to Unary law in PicoPhysics. It also avoids conflicts with contemporary inclusion of neutralization in conservation concept by being soft on the Konservation concept.

However, this corollary misses the word 'Space'. It is important for statement of Unary law to be able to include Anti-Konservation. This highlights Kenergy characteristics as Konserved reality. It also provides a direct and conclusive relationship to human observations. It makes Unary law less abstract, bringing it closer to reality.

Next difficult contemporary concept to understand was Time. In a way it was much more difficult than Space and Kenergy. This concept is integrated into human physic. It is very difficult to have a thought processes devoid of time. Intuition and Speculation was used to integrate time with concept of Space and Kenergy. The word 'Contain' in Unary law is indicative of this processes as well as geometric containment.

***Thus word 'contain' in Unary law represents geometric confinement as well as dynamics that confine Kenergy in Space as well as time.***

Initially, Unary law was formulated to understand interaction between Kenergy in different confinement states. The interaction will be known as Space Limited Interaction. It has been realized after immigrating to Canada(1996), that Unary law describes the Unary Interaction. The Unary Interaction is interaction between

Space and Knergy. All other interactions can be described in terms of interaction between Space and Knergy.

In latest understanding;

***Unary law 'Space Contains Knergy' describes the Unary Interaction between Space and Knergy.***

The above statement summarises the position of Unary law in Picophysics to-date.

#### **4. *Unary Law Vs Fundamental Laws Of Physics***

In contemporary physics we have multiple universally applicable laws. The prominent among them are those who changed human intuition. These are Newton's law of motion and Einstein's Relativity. Laws of thermodynamics and Schrödinger's equation have universal appeal as well.

The concept of inertia when enunciated as universal law in Newton's laws of motion was at variance with human intuition that without an external motive force (power), all objects would come to rest and that moving objects only continue to move so long as there is a power inducing them to do so. This intuitive thinking is still valid and basis to judge the physical development of human body in competitive sports.

Newton observed astrological objects. In the process he explored the Inertia concept. He found it applicable to astronomical objects. The application to objects on earth was not that straight forward as human intuition guides otherwise. He speculated and applied to all objects to arrive at universal inertial concepts.

***Newton opted to formulate laws of motion, to directly state how it conflicts with the currently held belief and Intution.***

When taken with explanation that motive force (power) is required to balance force of resistance (drag) of the medium (air) the newton's inertia wins. Now-a-days Inertia is part of human intuition.

Due to size of observed objects relative to size of earth, a preferential frame of reference got embedded in human intuition. This influenced laws of motion, conclusions about relative motion and on addition of velocity. Addition was an abstract concept from mathematics. It included symbolic representation of quantity by a number, and dropping physical nature of object. Thus the concept of addition only part represented nature. Its application to all objects and situation was

extrapolated in human intuition. Lorentz experiments were in part result of this human intuition of applicability of abstract concept of mathematics to measurements on motion.

The important part of Einstein's relativity was invariance principle. This invariance concept evolved from human experience of traveling long distance in ships that move with little or no acceleration. So your experience (essentially mass, weight, human physical power etc) is invariant with respect to speed of ship (though change in speed matters while it is changing). The experience is extended to the laws of physics that result in human experience. So invariance of physical laws is established through human experience. The laws of physics are invariant with respect to observer. The observer is the human traveling on the ship.

Einstein in a way extended this human intuition to all laws of physics and replaced observer with frame of reference (to apply to result of Michelson's Interference Experiment). In a way, Einstein was the first to bring forward the missing element in science of mathematics – the nature in the form of object.

***Einstein relativity was the first theory that enunciated motion as law of nature.***

Before Einstein motion was projection of object's motion on observer. Einstein relativity was the first theory that enunciated motion itself as law of nature, rather than relative state of object with respect to observer in Newtonian mechanics. It used invariance principle (Galileo) to explain intricate behaviour of nature. He made law of invariance universally applicable, not just to motion.

Though it took some time, but now Einstein's relativity is part of Human intuition. The enunciation of relativity laws in terms of Lorentz Invariance was a choice made. Now Invariance law is a part of human intuition. When a cause and effect relationship is analysed, it is checked against the principle of invariance.

***In PicoPhysics we adopt Newton's approach in formulating text for laws of nature.***

Laws of thermodynamics have universal applicability. They find their origin in human perception about heat and temperature. The generalization in terms of enthalpy and entropy makes them universally applicable. In a way, current direction in astrophysics about expanding universe can be related to laws of thermodynamics. One can find influence of laws of thermodynamics (law of entropy) in PicoPhysics on conservation aspects of photon's energy. (Isolated photon either loses energy with time, or at best keeps its energy – result of occupied space characteristics).

Generalized Laws of thermodynamics are not directly comprehended as human experience. They imbibe some unique aspects of nature. They are abstract representation of nature to human brain.

Schrödinger's equation is one of the most important law in contemporary physics. It has many missing links to nature. Similar to Einstein relativity making motion as law of nature is generally hidden from human psych. Schrödinger's equation has many more such hidden trails. Kenergy is present in the equation as the wave function describing its distribution over the Space-time.

***Overall Schrödinger's equation can be said to be a representation of Unary law in advanced mathematical representation.***

However, it is abstraction in the extreme. It is very difficult to comprehend. In our dispensation we will refer to this law when we reach a stage to be able to interpret it.

##### **5. *Picophysics – Unification Process***

Pico-physicist uses Intuition, Speculation, Abstraction and Concept observers as tools to understand contemporary physics. He uses concepts such as Observer, Kenergy & Konservation, Space & Anti-Konservation, Time and dynamic universe as derived from Unary law to link laws of contemporary physics into Unary law. To a Pico-physicist;

***Laws of contemporary physics with universal applicability are facts of nature to be understood and integrated into Unary law.***

Pico-physicist uses Intuition, Speculation, Abstraction and Concept observers as tools to understand contemporary physics. He uses concepts such as Observer, Kenergy & Konservation, Space & Anti-Konservation, Time and dynamic universe as derived from Unary law to link laws of contemporary physics into Unary law. Most basic facts that are important and embedded into our Intuition are first brought out and re-established in Pico-physics from Unary law. The basic facts in Pico-physics include 3-D Space, Heterogeneity of Space, Speed of light as translation between length and time, Path-Continuity of Kenergy, Granularity of Kenergy, Refraction of light (result of non-homogenous space) being the Unary Interaction. The formation of matter in elementary form, is than modeled out of Kenergy. The properties and laws of interaction of this matter is then used to explain and integrate the laws of contemporary physics into Unary law of Pico-physics (Space contains Kenergy).

## 6. **Success Story (Geometrical Properties Of Space)**

Participation in FQXi ESSAY CONTEST 2012<sup>i</sup>, generated stimulus to devote considerable time on concepts of PicoPhysics. During this period it became evident that geometric properties of space has been taken as a fact in formulation of PicoPhysics. The inclusion of the same, into **UNARY LAW** will increase our confidence into concepts of PicoPhysics. The objective of integrating the geometrical properties of anti-Konserved space has been achieved.

A proof of **Pythagoras' Theorem** not based on geometrical properties will establish the geometrical properties of space for us. The spatial transformation (location and orientation) of objects and observer are all addressed once this theorem is established. Algebraic proofs of Pythagoras' Theorem were seen to contain geometrical of area, congruency or shape. The proof of Pythagoras' Theorem using concepts embedded in PicoPhysics, enabled us to integrate geometrical properties of space into **Unary Law**.

Using the PicoPhysics result that measurability is a result of Konservation the logical sequence in proof consists of; simultaneity and event sequence, 3-spatial dimensions of space –corollary<sup>ii</sup> to unary law, invariance of speed of light, a re-look at **Michelson–Morley experiment**<sup>iii</sup> together with required simultaneity of events at half-silvered mirror, establishes Pythagoras' Theorem. This proof uses no geometrical concept except sequencing along the three dimensions of space.

The inclusion of geometrical property of space, into unary law has filled the gap identified last year in the understanding of nature. This gives me as a Pico-physicist immense pleasure.

## 7. **Digital Reality**

The topic of this year essay competition is digital reality. Representing information as a series of items in either of two feasible states has fascinated some philosopher of science to understand reality as two states of universe. These states have been related to psychological states by some. In Picophysics unary law guides us to a unary particle which is present in contemporary physics as Photon (result of Konservation & confinement). Next complexity level results into elementary particles. The progressive levels are nucleus, atoms, and finally matter composing the natural objects. Any object has integral number of photons (Unary particles). All unary particles are identical in all respects (of interaction with space). Thus it can be said, the nature is binary, some parts are occupied by Knergy others are not. This is enunciated in Unary Law – Space contains Knergy.

Universe can be considered as a reality with two possible states as per Unary law (Space, & Space containing Knergy).

## 8. **Conclusion**

PicoPhysics seeks to understand facts of nature whether identified in contemporary science or embedded in human psychology.

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<sup>i</sup> Participated with essay on '5-Dimensional Universe by Vijay Mohan Gupta' accessed June 25,2013  
<http://fqxi.org/community/forum/topic/1326>

<sup>ii</sup> A general discussion on Unary Law Corollaries accessed June 25,2013  
<http://vmguptaphy.files.wordpress.com/2012/03/unary-law-corollaries.pdf> .

<sup>iii</sup> Michelson\_Morley experiment accessed June 25,2013 on Wikipedia  
[http://en.wikipedia.org/wiki/Michelson%E2%80%93Morley\\_experiment](http://en.wikipedia.org/wiki/Michelson%E2%80%93Morley_experiment)