


Logic's Information Touchstone

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Abstract: Proposed here is a touchstone logic for physical phenomena, notable as a proposed logic for the zero-dimensions of time and space, specifically for time as a moment and space as a point. The proposed logic utilizes the conjecture that a moment in time is not a point in space, and by their difference, according to a specific mathematically labelled logic, the dimensions of time and space become manifest. The manifestation of the dimensions from zero-dimensionality are thence shown to encompass a time and space dimensional number theory that when scaled with physical phenomena is shown to harbour all the known information of quantum field theory and general relativity. The confounding result for this zero-dimensional number theory as a physical theory is the stars beyond this solar system derived as being a holographic projection of activity in this solar system's Hydrogen wall. Discussed here therefore is whether the proposed touchstone logos used here is or is not an exact account of physical reality's structure.

Keywords: logic, information, temporal mechanics, zero dimension; zero-dimensional; sentience

1. Introduction

Here upon the work of Temporal Mechanics¹² and associated zero-dimensional number theory, specifically in extending from paper 57 [57], the issue of the zero quantum gravity (0QG) holographic astrophysical model beyond this solar system needs to be addressed³. Specifically, the question asked here is how is it possible for a model that can capture all data relevant to quantum field theory (QFT) and general relativity (GR) present the case for a holographic display of astrophysical phenomena from the solar system's Hydrogen wall? For instance, is there a particular flaw in the basis and/or execution regarding the zero-dimensional number theory leading to this apparently anomalous result for the stars? Indeed, how can a theory as a steady state astrophysical model *not* present itself as a touchstone if it is able to harbor all information relevant to QFT and GR in a consistent zero-dimensional and thence fundamental basis context?

Identified here therefore must be:

- (i) what the idea of *information* is,
- (ii) what the *information of physical reality* pertains to as an abstraction and context,
- (iii) thence how that context can be self-evident as a touchstone logos, namely a most fundamental carriage logos of information.

There's no mystery to physical information to whoever holds and relates it, as physical information is generally known in the context it is gathered, received, and harboured. The question is how that information can be related and shared in a way common to and thence understood by all. This is especially so in the discipline of physics especially if that information is relevant to phenomena common to all, as it is. There in physics, a standard for information handling and sharing is the norm, typically in using *mathematics* and *dimensional geometric analysis* as that basis.

Here in this paper the idea of taking the mathematical idea of a point in space and moment in time is used to ask how then information is harboured central to that context, and how then the two general ideas of dimensional analysis emerge, specifically quantum field theory (QFT) and general

¹The current work of 57 papers detailing a new mathematical approach to the dimensions of time and space as zero-dimensional logic. see <https://www.xemdir.com/>

²[1][2][3][4][5][6][7][8][9][10][11][12][13][14][15][16][17][18][19][20][21][22][23][24][25][26][27][28][29][30][31][32][33][34][35][36][37][38][39][40][41][42][43][44][45][46][47][48][49][50][51][52][53][54][55][56][57].

³ [57]: p24-34.

relativity (GR), as flat and curved spacetime respectively. In achieving such, this paper is organized in the following manner:

1. Introduction
2. *Being informed*
3. Theoretic quests
4. Time's touchstone
5. Zero-dimensional theory
6. Logic's information touchstone
7. Conclusion

The process here is identifying the fundamental basis of the zero-dimensional number theory as a logos that thence is shown to harbour its information relevant to physical phenomena, a basis that underpins a basic process of consciousness known with the dimensions of time and space that by such presents the case for that zero-dimensional logos *to be a touchstone for such information*. How much that model of physical reality should be trusted as an account of what exists beyond the *known and explored* solar system shall be discussed.

2. *Being informed*

The abstract idea of *describing* phenomena was presented in paper 57⁴ as follows:

There, as has become evident today, describing physical phenomena "conjectures how" to label physical phenomena, namely:

- (i) *What aspects of phenomena are being labelled?*
- (ii) *With what precision?*
- (iii) *To what extent, namely how broad and wide (0 to ∞)?*

Accompanying such is realizing our own limitation of being conscious, namely:

⁴ [57]: p5-6.

- (iv) *Our resolution/pixilation of quantum (light) perception.*
- (v) *Such (iv) in primarily occupying the datum reference of time-now in 3d space.*
- (vi) *Such (v), in the context of a singular dimension (1d) of time's flow.*
- (vii) *Such (vi) in the context of what can be trusted to be physical laws as a consistent feature of physical reality and our consistent observation ability in it anywhere, anytime.*

As is generally agreed, our conscious experience of reality can be considered involving two basic features, two dimensional paradigms, that of the dimension of time⁵, and that of the dimensions of space⁶, all of such though as reality in a datum-reference of time-now, one time-now moment to the next, all of such in 3d space.

It would be natural for us to consider that the one dimension of time (1d) and the three dimensions of space (3d) are connected as four dimensional spacetime (4d). Thus, as much as we perceive reality in a type of continuous fashion in the datum reference of time-now, we would consider that reality also operates as a type of 3d space and 1d time continuum as 4d spacetime. Such is what physics proposes as 4d spacetime as a grand platform we would exist with/within⁷. We then with such a basis ask how physical reality performs as 4d spacetime. In fact, we test the theories we have of 4d spacetime to see if they measure up with observable physical reality. Further to this, we assess how the description of 4d spacetime can represent the general platform for the description of all other phenomena. By such, as all the data suggests, two versions of spacetime have become apparent, flat 4d spacetime for QFT and curved 4d spacetime for GR.

Of note in this process is that no dimensional number theory has been able to link flat and curved spacetime, or rather there is no dimensional number theory describing the physical phenomenal link between flat and curved spacetime, Thus, mass is still the great mystery of description ordaining the requirement⁸ of flat and curved 4d spacetime questing a mass-based number theory link between flat and curved 4d spacetime. How did we get there though, how did we construct the descriptions for curved and flat 4d spacetime?

That train of discussion lead to the derivation of the two facets of dimensional physical theory, namely QFT and GR. The data of QFT and GR was thence applied to the zero-dimensional number theory.

⁵ 1d, as a type of arrow.

⁶ 3d, namely spatial volume.

⁷ As a dimensional mathematic model and associated physical theory.

⁸ By current theoretic and measurement standards.

By such, the zero-dimensional number theory developed a model of physical reality, as the zero-dimensional physical theory. The problem there, as highlighted in paper 57, was that the zero-dimensional physical theory presented a model that considered the stars to be a holographic projection of events in this solar system's Hydrogen wall. The question is now asked is if such is in fact true, if that physical theory model is an actual model itself of reality, an information script of the laws of physical reality.

To answer such, a more fundamental idea to the zero-dimensional number theory needs to be proposed, namely the question of its logic and how that relates to our conscious ability. Not just such, yet how information can be coded and thence stored, and in the case here, how the information of physical reality is described and assembled as a true account of physical reality in the form of a physical theory.

The idea of *information* is an abstract concept⁹ referring to that which has the power to inform. Fundamentally, *information* pertains to the interpretation of that which may be sensed, usually describing observable medium patterns not entirely random. Generally, the act of describing phenomena typically comes down to communicating what one perceives as information. To do that effectively as a species standards need to be implemented.

In grading any such standards, the basic idea of communication itself perhaps needs scrutiny. There, *communication* is generally defined as the transmission of information, most basically verbal, between people(s). The following ideas can be considered:

- (iv) This transmission happens most basically through a physical medium.
- (v) The most basic physical medium of communication is air, as per our making use of sound in the form of verbal communication.
- (vi) In early societies, spoken language was the primary form of communication, limited by the poverty of human social infrastructure networking.
- (vii) Writings in the earliest forms were pictograms as graphical symbols that conveyed visual meaning attempting to resemble real-world objects.
- (viii) Alphabetic writing systems were thence developed in needing to make pictograms more efficient.
- (ix) Currently, communication goes beyond using air and writing mediums, primarily in using the EM medium.

⁹ Meaning it is quite arbitrary as a labelling process.

In its most basic sense, communication most likely arose as a process of hearing physical sounds in nature and then translating those sounds to words. The sounds of waves crashing, the howl of a tornado, the clap of lightening, the rumbling roar of thunder, all physical sensations in the form of sound accompanied with sight. One could imagine these sounds became as words vocalized by early humans explaining what they heard in reproducing those sounds.

Yet what is the meaning of those words? Are words enough as sounds of nature being reproduced a good start point to understand the laws of nature, or is a more transcendent process required, something beyond physical reality itself, as though there could be a wiring under nature's physical platform that needs understanding?

Indeed, any number of formalisms of all the sounds and sights of nature as a written and spoken language can be constructed. The core logical end game to the process of words describing reality based on experiences would prescribe a philosophy, and thence an ontology identifying the nature of how the human being experiences reality and how the human being can communicate its experiences. Is though such a process a complete way to understand existence itself, to understand the nature of reality as a science? Fundamentally, is our subjective sensation-based experience of nature enough to explain the science of existence, or is something more *transcendent* to our sensation-based subjective being required?

The real question should be if there is there an underlying law structure in nature beyond words, beyond words inspired by a subjective sensation-based method? The proposed solution here is that numbers and mathematics, given their objectivity and impartiality, could have a fundamental association to reality, presumably on a transcendent level to subjective sensation-based experience.

3. Theoretic quests

Fundamentally, the general study of physical phenomena is executed by physics, and numbers with geometry are the best if not most efficient way to label and then conjecture theories for physical phenomena. There, numbers with geometry aim to abide by, match, if not predict phenomena and thence establish universal laws and associated principles of symmetry. The process of applying numbers to physical phenomena using calculus was described in paper 57 [57].

Any theoretic quest aiming to describe physical reality takes the basic assumption of thought as a key process to describing reality, a process of thought as reason confirming observed data, and thence how such can be brought together as a whole theory. This thence does imply by this assumption that *thought* as a *key* to this quest is or rather *needs to be* compatible with the quest, with what is described

on that quest, and so here physical reality. Do physical theories though sufficiently identity with their thought process, their logos, as being fundamental to the theories and thence models formed of physical reality?

In explaining physical reality in joining all the physical phenomena via a description process, in being confined as humans as we are on this planet, in our locales wherever they are, two things become evident as we seek to describe what exists beyond our physical confined human frame:

- (x) the *scope* and *scale* of what we are describing:
 - spatial and temporal dimensions.
- (xi) the *specific nature*, or rather *exclusivity* of *what* we are describing:
 - this, that, or the other, usually classed in a *law of thought* process of determination.

According to philosophy, *laws of thought* are fundamental axiomatic rules upon which rational discourse itself is based, rules underlying human thought and expression accounting for what is considered as valid thought and expression of such. The idea of the *law of thought* is usually described with three expressions:

- (xii) the *law of identity*:
 - *For all a, a = a.*
- (xiii) the *law of contradiction* (or non-contradiction):
 - *nothing can both be and not be.*
 - *one cannot say of something that it is and that it is not in the same respect and at the same time*
- (xiv) the law of excluded middle:
 - *either a certain proposition or its negation is true.*
 - *everything must either be or not be.*

In a developed sense, the *laws of thought* become a process of confirming a theory, namely that a theory either is upheld or is not, by any nominated process of determination and associated use of information. These quests are usually documented and shared in what are called *journals*¹⁰ that identify disciplines and associated charters and the developments along such from their inception.

¹⁰ Journals listing [58].

In terms of what information relies on most of all, namely our senses, it could be fair to say that something either *is or is not* as based on our senses, our awareness, of that something. Yet is there a fundamental compass, a fundamental basis, to what we sense regarding the dimensions of time and space, such to guide both our logic and use of information to construct theories of reality? Indeed, what if we were to transcend our senses and apply the *law of thought* to the dimensions of time and space, to the ultimate zero-dimensional basis of time and space? What could happen there?

4. Time's touchstone

In noting the vast theoretic territory proposed here in establishing a new fundamental basis for the *laws of thought*, namely a touchstone basis for the dimensions of time and space, a few accessory questions and ideas perhaps need to be presented. For instance:

- (xv) Why must we investigate reality to understand how it works?
- (xvi) Are or are not the inner workings of reality a self-evident thing?

Simply, the question asked here is if there is a natural block if not underlying hidden aspect embedded in our normal waking consciousness that prevents us from understanding in plain sight the workings, the physics, of reality? Key ideas to consider are:

- (xvii) Our reference as humans highlights a type of subject-object relationship we have with reality.
- (xviii) If our perception ability is sufficiently developed and refined, and reality itself is self-evident and consistent enough, why is it that we do not intuitively recognize the apparently immaterial if not transcendent laws of reality?
- (xix) What therefore prevents us from instinctively if not in plain sight understand the workings of reality?
- (xx) Would understanding the workings of reality automatically confer our ability to manipulate such laws to our advantage as though we are possessed with the perceptive keys of those laws for us to control the laws of nature, or are the laws of nature central to a level that transcends physicality, that which physicality must abide by?

In considering there could be laws to nature that transcend physicality itself, how therefore should we understand that which we have no direct physical association with? For instance:

- (xxi) We see water, consume and bathe in water, try to control water without drowning, *and so on.*
- (xxii) We see fire , are warmed by fire, try to control fire for energy without being burnt, *and so on.*
- (xxiii) We see air, seek to fly through air, try to control air without suffocating, *and so on.*
- (xxiv) We touch the earth, stand upon earth, in seeking not to be consumed by it, be crushed by it, *and so on.*

Yet is there something else, another ingredient we can't see, can't feel, can't hear, can't taste, can't sense, something that is an invisible thing yet paradoxically ever present, something presumably as the basis for all nature's laws? Or must we transcend physicality and thence perhaps the idea of consciousness to reach a fundamental law basis to physicality?

There is a fundamental undeniable fact of our existence that is perhaps the most overlooked condition in physics theory, and that is we exist in a theoretic moment, one moment to the next, and thus in a zero-dimensional datum reference for time. Indeed, there is a self-evident *arrow of time* as time's flow associated to the existence of reality in the theoretic zero-dimensional datum reference of time, yet the fundamental underlying condition for reality is that we exist *in* that zero-dimensional datum reference of time's moment. It is perhaps the most self-evident basic condition of our existence and associated sentience, so self-evident it is virtually ignored.

Temporal Mechanics and the zero-dimensional number theory proposes that it is the zero-dimensional realm for time and thence space, an apparently invisible realm, as that which is not plain to our senses yet ever-present in time-now, *as that realm which is responsible for all that we cannot sense in plain sight, namely the basis for the laws of nature*. Although we see the effects of the laws of nature *in nature*, it is proposed we do not see the laws themselves as perception-based constructs because of time's touchstone. The proposal here therefore is to apply the laws of thought to zero-dimensional time and its other proposed counterpart zero-dimensional space, to then derive dimensionality and thence the laws thereof. By such, the Temporal Mechanics quest has been to uphold the laws of thought and make them applicable to the laws of nature, to decipher the laws of nature using these laws of thought for zero-dimensional time and zero-dimensional space.

5. Zero-dimensional theory

The Temporal Mechanics proposal is to apply the zero-dimensional status of time-now, the moment, with the idea of space, and thus with the idea of a point(s) in space. There, the proposal is to apply the *laws of thought* to the zero-dimensional basis for time and zero-dimensional basis for space, that they are not the same in quality and thence mathematical labelling.

Here, given the idea of *meaning* is subjective and requires choice, one thing not being another, with zero-dimensionality *meaning* is prescribed by the *laws of thought* as time not being space and space not being time, such being as a way the idea of the time-now paradigm of existence is upheld which as an idea is related to yet separate from how zero-dimensionality exists for space as points in space¹¹.

Associated to the zero-dimensionality for time and space is a *paradox*, a *scaling paradox* for zero-dimensional space, namely the paradox of the size and number of zero-dimensional space as points. This paradox is resolved as a first step of resolution by proposing two things:

- (xxv) labelling time-now as the mathematical value of “1”
- (xxvi) labelling zero-dimensional space (point) as 0.

The second step of resolving the zero-infinity scaling paradox for a point in space is to address what does not carry a paradox, and that is time-now. There the proposal was to create two new datum-references for time:

- (xxvii) time-before.
- (xxviii) time-after.

In doing such, dimensionality is created for time. Yet what of the mathematical label for time-now as 1, and the mathematical label for a point in space as 0? The third step therefore of resolving the zero-infinity scaling paradox was to label time-before and time-after according to what our senses, and thence what information, is compatible with. There it was proposed:

- (xxix) time-after is unknown as much as the future is unknown to our senses.

¹¹ Otherwise, on a most fundamental level time would be space and thence from that emerge the idea of length of space being length of time, which is not the case.

(xxx) time-before must be a factor of time-after.

These (xxix-xxx) lead to the derivation of the golden ratio equation for time, namely $t_B + 1 = t_A$ where $t_B^2 = t_A$. Associated to such was the derivation of the three spatial dimensions and thence Euler's equation for space as $e^{\frac{i\pi}{t_B}} + 1_{t_N} = 0_{t_A}$. This (xxv)-(xxx) was initially described in paper 1 and then expanded upon in volumes 7-8 of Temporal Mechanics, papers 43-56¹². There, key mathematical operators and their associated equations relevant to this proposed process are identified, and by such are proposed as solutions to the Clay Mathematics Institute Millennium Prize problems¹³.

The outstanding and novel idea proposed by Temporal Mechanics and zero-dimensional number theory therefore in comparison to contemporary physics theory is a greater mechanics to the idea of time, hence the theory in general being termed "Temporal Mechanics", as the mechanics of time. Indeed, the mechanics of time implies there is a structure to time's arrow in this datum reference of time-now, going into and from that datum reference, suggesting a type of dynamic of information with time's arrow. That is precisely what Temporal Mechanics and associated zero-dimensional number theory is all about.

Fundamentally, Temporal Mechanics presents the zero-dimensional number theory as a hypothesis to be tested; core to that hypothesis are the two derived dimensional equations for time and space, the golden ratio equation for time and the Euler equation for space. The words used to describe the resultant physical theory merely represent an expression of a proposed *dialectic mathematics*, namely a discourse between the two fundamental dimensional equations of time and space, describing thence the known laws of physical reality. This was summarized in the previous paper [57].

By such, it is found that zero-dimensionality is the ideal lever to construct a mathematical basis for dimensionality as a number theory conjecture to be tested in pointing to a physical theory comprising of known demonstrable equations. There, the process of dimensional formulation from zero-dimensionality conforms with the emergence of known physical theory equations and associated physical phenomena descriptors.

¹² [1][43][44][45][46][47][48][49][50][51][52][53][54][55][56].

¹³ "To celebrate mathematics in the new millennium, the Clay Mathematics Institute of Cambridge, Massachusetts (CMI) established seven Prize Problems. The Prizes were conceived to record some of the most difficult problems with which mathematicians were grappling at the turn of the second millennium; to elevate in the consciousness of the general public the fact that in mathematics, the frontier is still open and abounds in important unsolved problems; to emphasize the importance of working towards a solution of the deepest, most difficult problems; and to recognize achievement in mathematics of historical magnitude" [59].

By contrast, physics' basis of mass invariably yields to the basis of laws that govern mass and thence inertia *for all phenomena*, thence of action-reaction, as fundamental laws for all phenomena. These laws although valid are in essence though, as shown by the zero-dimensional number theory, *secondary laws* to the more fundamental "is" and "is not" *laws of thought*. By such, a physical theory based on mass is symbolically dogged as a snake forever chasing its tail, confined in an endless process of cause and effect, a chicken and egg scenario, namely which comes first, the chicken or the egg, simply because the datum-reference of time-now had not been given the proper priority of place in preference to mass.

6. Logic's information touchstone

Is therefore the Temporal Mechanics process correct and thence the results *real*? To answer this is to ask how *well* reality can be defined, and if indeed observed reality can be defined with logic/reason and information alone.

As mentioned in section 2, *information* is an abstract concept that refers to that which has the power to inform as per how we interpret our senses, usually describing observable patterns not entirely random. There, the act of describing phenomena comes down to communicating what one perceives as information, ideally in a *standardized* way. For physics, in being the art of describing physical phenomena based on the dimensions of time and space, mathematics and geometry *are that standard* in primary analysis of mass.

Another point to note about information is that information is executed *iteratively*, namely as a series of steps as a *process*, thence involving the feature of time. In physics, that *iterative* quality is considered as time's flow and how that is measured as entropy. These features are derived and accommodated in the zero-dimensional number theory per the dialectic mathematical relationship of the two derived equations for time and space, namely $t_B + 1 = t_A$ (where $t_B^2 = t_A$) and $e^{\frac{i\pi}{t_B}} + 1_{t_N} = 0_{t_A}$ respectively¹⁴. This then translates to a geometric mathematical model of reality that demonstrates its capacity for harboring and communicating all the known data of physical theories, constructing a model of this solar system correct to all its equations, constants, and relative dimensional scales, except for how the stars are proposed to manifest. There, the stars beyond this solar system are derived as holographic projections from the solar system's Hydrogen wall, which is an interesting result. The

¹⁴ [57]: p15-24.

etiology of that result was presented throughout the previous paper [57]. The question now is why that derivation became evident.

In looking at points (xxv)-(xxx), and the assumption of how we perceive time regarding time-after and time-before as per (xxvii)-(xxviii), it does appear that such an assumption as an *intangible* ingredient has led to this holographic result, namely a *greater intangible* as the Hydrogen wall's holographic projection of stars beyond this solar system, which may suggest our conscious ability has a universal aspect to it¹⁵.

Despite such, given logic is the study of correct reasoning, it seems that the zero-dimensional number theory approach here is consistent in its methodology with both its *laws of thought* and with how we are conscious of the dimensions. This approach subsequently is consistent with the information and associated data of what we are conscious of, as gathered through the two key physical theory models, namely QFT and GR. Here therefore is presented the case for *logic's information touchstone*.

What is not being presented here, therefore?

What is ***not*** being presented here is a *time and space machine*, as perhaps Temporal Mechanics would otherwise imply. Reality itself is presented as the time and space machine, and so here the zero-dimensional number theory is simply and at best an idea that can be understood for what it is, namely something that can be relatable and understood to sentience describing *logic's information touchstone* as it pertains to *physical reality*.

Considering such therefore, the zero-dimensional number theory, as the proposed information touchstone of logic, is ***not*** Boolean logic. This is a point that should not be underestimated. Consider for a moment if Boolean logic was intrinsic to a logic of physical phenomena, to thence have the capacity to *flow* with reality and reality's laws in a seamless way as a system of logic and associated information. There is no evidence for such, even with our greatest AI systems¹⁶, and the reason for this is that Boolean logic is not a proper and thus basic *law of thought* mechanism for information yet an artificial one with its own truth-conditions¹⁷. Although Boolean logic and those machines exist in and abide by the laws of nature as any physical structure does, the information of Boolean logic is not in sync with reality itself, and thus it would seem ***not sentient***¹⁸. The conclusion here therefore is that Boolean logic and associated information can only be sentient in an artificial manner and thus in a manner not consistent with *natural sentience*.

¹⁵ To be followed up in a subsequent paper.

¹⁶ For example, ChatGPT [60].

¹⁷ The idea of using truth values denoted as 1 and 0 as true and false respectively, thus in stark contrast to how 0 and 1 are used for the zero-dimensions of space (0) and time (1) in zero-dimensional number theory.

¹⁸ To experience feelings and sensations.

7. Conclusion

Here, the zero-dimensional number theory and its associated logic is demonstrated as information's touchstone, not as Boolean information seeking to define itself by Boolean logic, yet an information directly sensed with nature by virtue of the zero-dimensional number theory deriving those laws consistent with what is observed of nature.

Conflicts of Interest

The author declares no conflicts of interest; this has been an entirely self-funded independent project.

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