

# The zero-dimensional physical theory (V): information, energy, efficiency, and intelligence

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**Abstract:** Proposed here is the case for a number theory derived from a mathematical description of zero-dimensional time (as a moment) and zero-dimensional space (as a point) as the underlying mathematical information base of physical phenomena. In support of this, the proposed zero-dimensional number theory is scaled with the charge of the electron and speed of light to translate into a physical theory confirming known mathematical descriptions of physical phenomena together with proposing new mathematical descriptions for physical phenomena that physics has yet to attain by its current mathematical approach. Specifically, examined here is how this process of physical theory formulation prescribes the contemporary ideas of information, energy, efficiency, and intelligence. By such, the modern scientific method is examined and found both problematic and limited in attempting to relate numbers and geometry directly to physical phenomena. Proposed here therefore is the case for the zero-dimensional number theory as the core mathematical information base of physical phenomena as per its indirect physical phenomenal route of mathematic and geometric execution.

**Keywords:** zero-dimensional; information; energy; efficiency; intelligence

## 1. Introduction

In this modern era of information-technology, the emphasis is on how to build smarter and more energy-efficient technology. That emphasis also presumes a smarter understanding of physical phenomena and how such an understanding can convert into technologies with just as intelligent and efficient mechanisms of execution. The paper here presents the case for how that process of identifying the right science to fulfil that task can be achieved.

The context of this paper, the 54<sup>th</sup> on the Temporal Mechanics zero-dimensional theory<sup>1</sup>, specifically here as paper 5 in the 8<sup>th</sup> volume<sup>2</sup> of Temporal Mechanics, is central to describing the physical theory from the described 7<sup>th</sup> volume<sup>3</sup> zero-dimensional number theory proposal. Specifically, here will be presented a circumspect account of the zero-dimensional physical theory formulation process, accounting for the ideas of information, energy, efficiency, and intelligence, themes consistent with the current quests of 21<sup>st</sup> century physical research. As such, this paper is constructed as follows:

1. Introduction
2. The context of this paper
3. Information, Energy, efficiency, and intelligence
4. The current scientific approach
5. Conclusion

It is no fluke that humanity has found itself on the path of information, energy, efficiency, and intelligence. In fact, it could be argued that the by-product of unintentionally executing scientific misinformation, energy waste, inefficiency, and a lack of insight/intelligence, especially regarding that associated use of technology, has impacted our natural environment *adversely*. By such, much of the aim today in science particularly physics is in better understanding the fundamental and correct information of physical reality to thence develop more energy efficient and sustainable technologies for our better survival with that nature we are trying to more intelligently understand and work with.

The question here is how information can be based on a number theory itself, and how that can then relate with physical phenomena, here namely energy, and how that concept of energy as the fundamental process of physical phenomena is given efficiency by its underlying networked number theory, and how then all such leads warrants a discipline of intelligence and thence presumably our more intelligent existence in nature.

## 2. The context of this paper

Paper 48 [48] of Temporal Mechanics described the philosophy of numbers, highlighting their abstract nature, including how they are used with geometry and thence points, all proposed as abstractions, as abstract concepts *about* physical reality and *not being* physical reality per se. With that philosophy of numbers and geometry (using points) a number theory was developed in paper 49 [49]. The next hurdle was making that number theory *relevant to* physical reality. The proposal in paper 50 [50] was to scale the number theory to physical reality, specifically to two known values of physical data,

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<sup>1</sup>[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].

<sup>2</sup>[50][51][52][53].

<sup>3</sup>[43][44][45][46][47][48][49].

namely the values for the speed of light  $c$  and the charge of the electron  $e_c$ . That number theory of paper 49 [49] was thence proposed to represent a physical theory [50] if all its equations when scaled in such a way ( $c$  and  $e_c$ ) could account for known features of physical phenomena together with new features physics is only now learning about<sup>4</sup>. Paper 51 [51] thence addressed the key issues in contemporary physics theory, namely causality, locality, and indeterminacy, identifying their zero-dimensional aetiology in the process of measuring physical reality. Paper 52 [52] thence graphically mapped the nature of the medium of *timespace* intrinsic to causality, locality, and indeterminacy in preparation for the proposed new proofs (experiments) outlined in paper 53 [53].

In its most basic sense, the zero-dimensional number theory was asked to test itself by solving the most fundamental questions of mathematics, specifically the Riemann hypothesis [54], Goldbach's conjecture [55], and Fermat's last theorem [56]. The zero-dimensional number theory achieved those proposed solutions by using the two derived values of the emergent golden ratio equation ([49]: p10-15) which together as a product result in  $-1$ , noting Euler's equation  $e^{i\pi} = -1$ . The Riemann hypothesis was then tested for the golden ratio features that should be embedded in  $e^{i\pi} = -1$  confirming that they indeed were ([49]: p18-23), noting that the golden ratio was derived in accepting a  $0 \leftrightarrow \infty$  paradox ([48]: p18)([49]: p8-9) when using a 0-dimensional basis for time and space.

What happened therefore was that in confirming Euler's equation and the golden ratio from a zero-dimensional basis for time and space, a 2d and thence 3d *timespace* reality were derived with prime number features. It was thence proposed that such a number theory basis could form the basis of a physical theory if scaled with two known values of physical reality, there the speed of light  $c$  and the charge of the electron  $e_c$ . To then prove Euler's formula further and the associated proposed solution to the Riemann hypothesis, that zero-dimensional number theory when scaled as such is being tasked<sup>5</sup> as a physical theory to correctly derive the known physical equations of physical reality and their associated physical phenomenal descriptors with those equations.

Here, in the absence of historical and/or contemporary works similar to this approach, Temporal Mechanics [1-53] defines the *state of the art* of why numbers and geometry should not be applied directly to physical phenomena in presuming to be a physical theory yet applied via a secondary route. Here therefore, not once is the zero-dimensional theory proposal suggesting a point (zero-dimensional space) is real. Here, a point is still an abstraction in space, as is a moment in time. Yet, to not each give zero-dimensional time and zero-dimensional space mathematical significance is considered as an incomplete execution of mathematics in what should be a true and complete arena of dimensional analysis. This was presented in paper 48 ([48]: p18-23). There, in joining the proposed mathematical labels for zero-dimensional time and zero-dimensional space, a number theory was derived/emerged as the proposed secondary route.

In short, the first test of the zero-dimensional number theory was presenting solutions for the Riemann hypothesis, Goldbach's conjecture, and Fermat's last theorem ([49]: p18-24). That number theory was then scaled to the speed of light  $c$  and charge of the electron  $e_c$  to consider itself a physical

<sup>4</sup> Such as the X17 particle: ([30]: p19-20).

<sup>5</sup>As per Volume 8 of Temporal Mechanics: [50][51][52][53].

theory candidate [50] by correctly deriving known and additional equations and values for physical phenomena. To be asked now is the relevance of this approach to the ideas of information, energy, efficiency, and intelligence, and how such can be compared with the current scientific method.

### 3. Information, energy, efficiency, and intelligence

*Information* [57], as with numbers, is proposed here to be an abstraction ([50]: p3-6), here as *information* referring to that which has the power to inform, and thus implying the notion of sentience. The information of the zero-dimensional physical theory is proposed to be the derived numerical dimensional patterns from the zero-dimensional number theory, patterns that are proposed to correlate with physical phenomena. Here, information is not knowledge itself, but the underlying number theory *meaning* of physical phenomena [58]. Such is the process of the zero-dimensional physical theory, namely having the data of physical phenomena available which is then processed into information via the filter of the underlying proposed secondary route zero-dimensional number theory.

Fundamentally here information is transmitted in time and space, and in its most basic sense is an emergence from the interoperation of zero-dimensional time and zero-dimensional space. That emergence is derived to most basically manifest as energy, as the most basic form of that interoperation of the zero-dimensionality of time (a moment) and zero-dimensionality of space (a point) *as information*. Here therefore with the zero-dimensional number theory, energy is an emergent network of data points as information in *timespace*, termed the *temporal wave function*, analogous to *EM* and its associated wave and particle (quantum) feature ([52]: 11-30).

The term *energy* is from the Ancient Greek term ἐνέργεια, *enérgeia*, as *activity*, as a quantitative/measurable property *transferred* to a body or to a physical system, recognizable in the performance of work and in the form of heat and light. With the zero-dimensional number theory, energy is precisely such as the fundamental emergence of the *temporal wave function* from the mathematical interoperation of zero-dimensional time and zero-dimensional space. As such, energy is a conserved quantity intrinsic to other features of physical phenomena, primarily mass, noting that energy cannot be created or destroyed other than being a primary emergence from a zero-dimensional basis for time and space, and kept as a constant (and thence conservation precedent) by the derived constraints of that calculated emergence process, namely by the derivation of minimum and maximum mass values ([50]: p6-17) and associated energy processes for 3d *timespace*.

A current puzzle in physics regarding energy and information is in the form of the “black hole information paradox” [59] where Einstein’s theory of general relativity predicts the existence of black holes as regions of spacetime from which nothing (including light and thus energy) can escape. Such then implies a destruction of energy into nothingness. This has thence required a mechanism to be adopted in the form of Hawking radiation [60] to account for the presence of a black hole without violating energy as a process of information conservation, a continual challenge for physics theorists [61-62] in formulating a theory of quantum gravity based on those initial postulates such that information is not lost for a black hole’s historical existence and mechanism. The thinking of design there is to uphold the idea that there

must exist a basis of energy efficiency whereby energy is not *lost* or *destroyed*. That fundamental precedent is upheld by the zero-dimensional physical theory in linking the known physical phenomenal features of *EM* and gravity ([52]: p11-44)([53]: p4-8).

Embedded in the conservation of energy precedent of the zero-dimensional number theory is a basis of efficiency for energy relationships in *timespace*. In general terms, efficiency can be considered as the measurable ability to avoid wasting energy. In more mathematical terms, efficiency signifies the level of performance that uses the least number of inputs to achieve the highest amount of output. Such is the quintessential basis for the zero-dimensional physical theory description of energy, namely in energy being an emergent property of the interoperation of the zero-dimensionality of time and space as upon the zero-point energy sheer of physical existence<sup>6</sup>. The resultant number theory thence describes this absolute efficiency that is proposed to underly physical existence in the form of interlinking equations relevant to the basic features of emergent energy (as the proposed temporal wave function); here, efficiency is a measurable concept that comes from a basic precedent of conservation of energy in establishing existent and available and relevant pathways handling the energy exchange processes of physical phenomena.

From a sentient perspective, efficiency of information can be regarded as intelligence [63], intelligence being the ability to perceive or infer information and to retain it as knowledge to thence be executed as adaptive behaviours within an environment. Such is precisely the process here for the zero-dimensional number theory in being applied to physical phenomenal data. Historically, the word intelligence derives from the Latin verb *intelligere*, namely, to comprehend or perceive. As with the ideas of the emergent dimensions of time as *time-before* and *time-after* with the zero-dimensional number theory ([49]: p10-16), the intelligence of the zero-dimensional number theory makes allowance for and describes the human *ability* to remember descriptions of things (*time-before*) and use those descriptions in future behaviours (*time-after*) as a streaming cognitive process in *time-now*. By such, the zero-dimensional number theory confers descriptors for the cognitive abilities of learning, concept forming, understanding, and reason<sup>7</sup>. Although intelligence confers the idea of sentience, an efficient information description of physical phenomena that streams with our sentient abilities is the essence of the zero-dimensional number theory. Logically, it could therefore be considered that the technologies of that resultant zero-dimensional physical theory would also stream with our sentient abilities. Is such a proposal though a step ahead of the current scientific approach in describing physical phenomena and associated development of technologies?

#### 4. The current scientific approach

Much of the current scientific approach is central to the *scientific method* [64], namely:

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<sup>6</sup>As zero-dimensionality for time and space: ([53]: p2-8).

<sup>7</sup> Introduced throughout paper 10, "The Conception of Time" [10].

- Formulating hypotheses of *physical phenomena* as per curiosities, inferences, and insights of *observations*.
- Testing those hypotheses per experiments most commonly as measurement-based statistical testings of deductions drawn from the hypotheses, thence leading to experimental findings.
- Refinement (or elimination) of the hypotheses based on the experimental findings.

The process in the scientific method involves making hypothetical explanations as *conjectures*, namely deriving predictions from the hypotheses as logical consequences, and then carrying out experiments or empirical observations based on those predictions/conjectures. For a scientific hypothesis to be meaningfully tested, it therefore needs to be falsifiable, implying that it is possible to identify a potential outcome of an experiment or observation that conflicts with predictions deduced from the hypothesis. How can a zero-dimensional number theory therefore be falsifiable if it proposes only one general result? The zero-dimensional number theory needs to support all known physical data with many opportunities therefore to be falsified. Simply the zero-dimensional physical theory can be falsifiable in not deriving what is known of physical reality in all its aspects.

The core problem though with the current scientific method is presuming that a hypothesis as a physical theory (involving numbers and geometry) can be a real and direct representation of physical reality. Technically, numbers and geometry are abstractions of physical reality, and so at best a physical theory can only approximate what it proposes to describe via its abstract use of numbers and geometry. There, the obvious consequence of a physical theory trying to mimic a process of physical phenomena is not being able to account in an absolute zero-dimensional sense<sup>8</sup> what exists, simply because zero-dimensionality of space as a point and zero-dimensionality of time as a moment do not in fact exist.

Thus, the scientific method in avoiding zero-dimensionality presumes its process of abstraction as being more real than a zero-dimensional basis, which technically is a fallacy, for indeed numbers and geometry cannot be presumed to be physical reality per-se given their abstract nature. There, the fault of the current scientific approach is to consider the dimensions as real things, and to give dimensions numbers, and thence suggest that numbers are physically real, which they are not. By such a process, information is related as intelligence, such in relaying equations as related to physical phenomena which thence by-passes an actual notion of efficiency, namely by-passing a zero-dimensional efficiency basis of mathematical information and thence energy. The proposed solution there is to acknowledge this fault of contemporary physics theory and associated use of numbers and geometry, and to thence develop a number representation for zero-dimensional time and space, and to then have a number theory emerge from that mathematical zero-dimensional interoperation of zero-dimensional time and zero-dimensional space, as presented throughout papers 49 [49] and 50 [50], and further detailed in papers 51-53 [51-53].

Albert Einstein in his lecture “Geometry and Experience” at the Prussian Academy of Science in Berlin on 27 January 1921 [65] described this problem of numbers applied to physical reality in the following manner:

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<sup>8</sup>Pin-point (zero-dimensional) descriptions for time (as a moment) and space (as a point).

*One reason why mathematics enjoys special esteem, above all other sciences, is that its laws are absolutely certain and indisputable, while those of all other sciences are to some extent debatable and in constant danger of being overthrown by newly discovered facts.*

*In spite of this, the investigator in another department of science would not need to envy the mathematician if the laws of mathematics referred to objects of our mere imagination, and not to objects of reality. For it cannot occasion surprise that different persons should arrive at the same logical conclusions when they have already agreed upon the fundamental laws (axioms), as well as the methods by which other laws are to be deduced therefrom. But there is another reason for the high repute of mathematics, in that it is mathematics which affords the exact natural sciences a certain measure of security, to which without mathematics they could not attain.*

*At this point an enigma presents itself which in all ages has agitated inquiring minds. How can it be that mathematics, being after all a product of human thought which is independent of experience, is so admirably appropriate to the objects of reality? Is human reason, then, without experience, merely by taking thought, able to fathom the properties of real things.*

*In my opinion the answer to this question is, briefly, this: - As far as the laws of mathematics refer to reality, they are not certain; and as far as they are certain, they do not refer to reality.*

Albert Einstein

Address to Prussian Academy of Sciences (1921)

In many ways, Einstein accepted the limitation of mathematics describing physical reality. The zero-dimensional number theory avoids this acknowledged limitation by accepting that zero-dimensionality is not physicality per-se, yet that physical reality *emerges from* zero-dimensionality. The question is how. There, the theory of zero-dimensionality [1-53] takes the idea of numbers *not being physical reality* and then delivers a zero-dimensional number theory as one that emerges from the proposed relationship of zero-dimensional time with zero-dimensional space, such through the proposed instalment of the dimensions of *time-before* and *time-after* ([49]: p10-16). That number theory is then scaled to physical phenomena to thence be shown compatible with what is observed of physical phenomena ([50]: p11-17).

A subsequent paper shall demonstrate physical reality to be a holographic projection from the zero-dimensional number theory level. Understandably, to measure a holographic projection in directly using mathematics and geometry would betray the *underlying* mathematics and geometry being the cause of holographic projection demonstrated to be physical reality, as shall be explained there.

## 5. Conclusion

A lack of regard for physical reality, the stage we stand upon and exist within, can have consequences in the form of our inadvertent authorship of natural catastrophes via technologies and

sciences that are not a true thorough fundamental account of physical reality. This paper has aimed to highlight a new intelligent approach to the analysis of physical phenomena, namely to the handling of energy and thence information in a zero-dimensional and thence proposed *absolute* zero-point efficient manner. This approach has been described and supported with proposed solutions to the Riemann hypothesis, Goldbach's conjecture, and Fermat's last theorem, together with deriving the known equations and associated constants of physical phenomena, together with new equations for phenomena physics has yet to successfully describe, when the zero-dimensional number theory is scaled with the charge of the electron  $e_c$  and speed of light  $c$ . Although the previous paper [53] proposed new zero-point energy research for this proposed zero-dimensional physical theory, further work shall highlight the holographic nature of physical reality and how such a lens of analysis can better describe astrophysical stellar phenomena.

### Conflicts of Interest

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

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