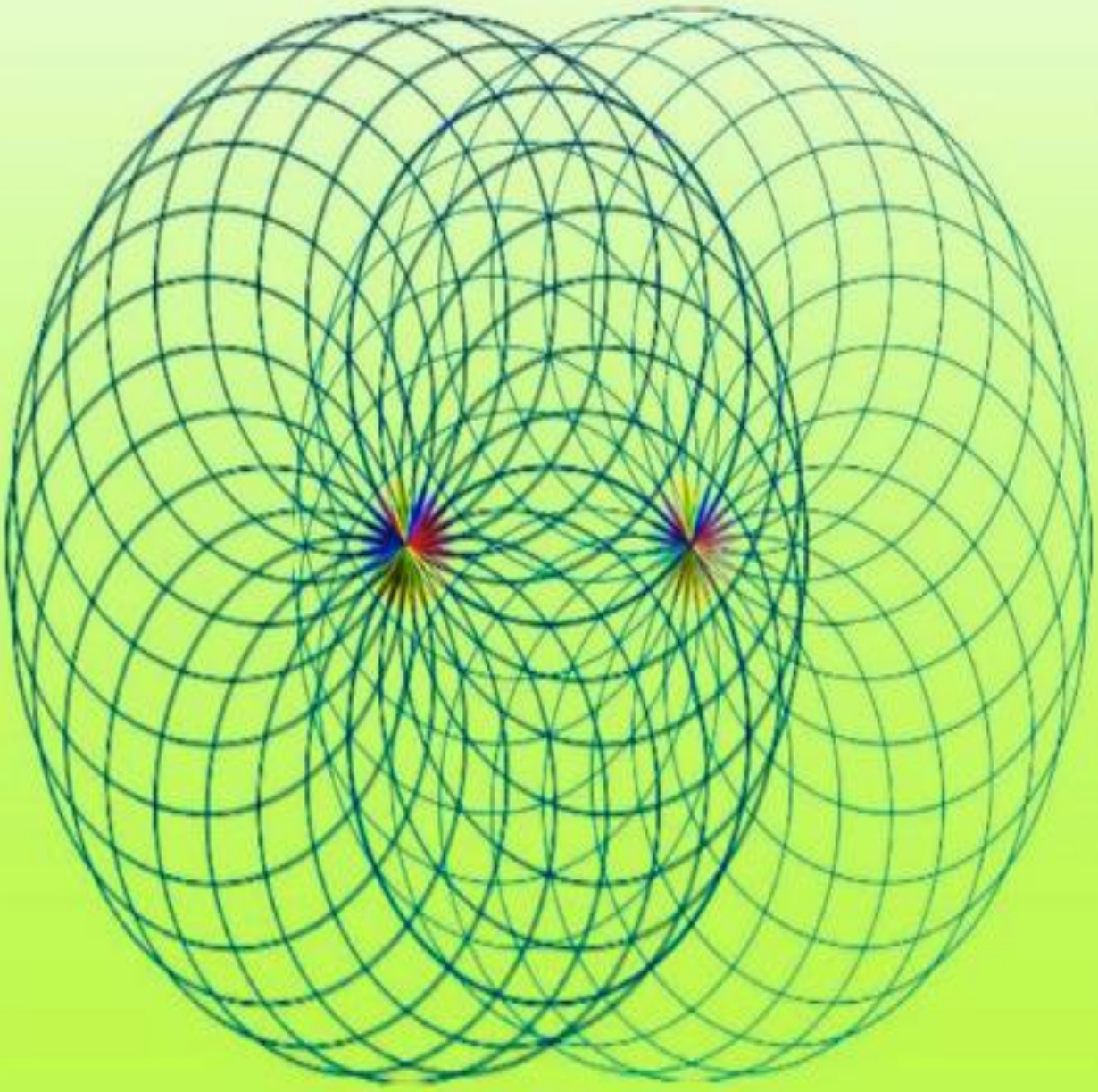
DPT

Dimensional Physics Theory



By Javier Aguilar

THEORICAL RESEARCH BOOK

About the DPT Series

- **Volume I — Conceptual Foundations** *(Completed)*: Introduces the philosophical and conceptual principles of DPT.
- **Volume II — Theoretical Foundations** *(This Volume)*: Develops the mathematical framework and theoretical predictions of DPT.
- **Volume III — Experimental Validation** *(In Preparation)*: Tests the predictions of DPT against experiments, simulations, and astronomical observations.
- **Complete Edition** *(Future)*: A unified volume containing the conceptual, theoretical, and experimental development of Dimensional Physics Theory.

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PREFACE

This volume constitutes the formal theoretical development of the **Dimensional Physics Theory (DPT)**, advancing beyond the conceptual foundations introduced in the preceding work. While the initial volume sought to articulate the philosophical motivations and intuitive framework of DPT, the present text is dedicated to the rigorous mathematical formulation of its principles and their implications for physical reality.

The purpose of this book is to establish DPT as a structured theoretical framework by expressing its core ideas in precise mathematical language. Here, dimensions are no longer treated solely as abstract or conceptual entities, but as quantifiable and dynamic constructs whose interactions can be modeled, analyzed, and, in principle, tested. The transition from conceptual insight to formalism is essential, as it enables the theory to be evaluated within the established methodologies of modern physics.

Throughout this work, we introduce equations, models, and relationships intended to describe the behavior of dimensional phases and their influence on space-time, energy, and the fundamental interactions. Attention is given to ensuring internal consistency, coherence with known physical principles where applicable, and the capacity for extension into experimentally verifiable predictions.

It is important to emphasize that, despite this progression toward formalization, DPT remains an evolving framework. The mathematical structures presented here should be understood as a first systematic attempt to encode the theory, rather than a final or complete description. As such, they are open to refinement, reinterpretation, and expansion considering further analysis and empirical investigation.

This volume is written with the expectation that its primary audience will include physicists, mathematicians, and researchers with an interest in foundational questions of reality. Familiarity with advanced mathematics and theoretical physics is assumed, as the discussions involve formal derivations and abstract modeling beyond the scope of introductory exposition.

The development of any new theoretical framework is inherently a collective endeavor. The author therefore encourages critical examination, independent derivation, and collaborative engagement with the ideas presented herein. Only through rigorous scrutiny and open discourse can the validity and potential of DPT be meaningfully assessed.

If the conceptual volume represented the question—*how might reality be understood through dimensions?* — this theoretical work represents the first attempt at an answer expressed in the language of mathematics.

The journey undertaken here is one from intuition to formal structure, from speculative insight to analytical expression. It is offered not as a conclusion, but as a foundation upon which further theoretical and experimental work may be built.

1. INTRODUCTION

This section serves as a **recapitulation of the conceptual foundations** presented in the first volume of *Dimensional Physics Theory (DPT)*, providing the necessary context before advancing into its formal mathematical structure.

The conceptual volume established DPT as a framework aimed at understanding reality through a **layered dimensional system**, where existence is not confined to a single plane but distributed across multiple interacting dimensions. At its core, the theory introduced the **Space–Time–Energy (STE) model**, proposing that these three elements are not independent in quantities but deeply interconnected components of a unified structure governing all physical and non-physical phenomena.

A central idea of DPT is that **dimensions are dynamic phases of existence**, each characterized by distinct forms of energy, behavior of forces, and types of beings. The conceptual volume defined **five primary dimensions**, ranging from the quantum scale (first dimension) to higher existential planes such as the fourth dimension (associated with dark matter and cognition) and the fifth dimension (associated with frequency, emotion, and dark energy).

Within this framework, DPT proposed a correspondence between **dimensions and fundamental forces**, extending beyond the standard model of physics. For example:

- The **first dimension** aligns with quantum behavior and the strong nuclear force
- The **second dimension** with molecular interactions and the weak force
- The **third dimension** with classical physics and electromagnetism
- The **fourth dimension** with gravity and dark matter
- The **fifth dimension** with a proposed **vibrational force**, governing frequency and existence itself

Additionally, the conceptual work introduced the idea that **known physical laws may represent projections or limiting cases of deeper dimensional interactions**, suggesting that phenomena such as gravity could be reinterpreted not only as curvature of space-time but also as a **dimensional resonance effect**.

Although primarily conceptual, the first volume also hinted at **mathematical structure** through references to well-established physical formulas and their dimensional relevance. In particular:

- The quantum relation $E = m\ x\ c2$ was associated with **first-dimensional (quantum) energy behavior**
- Einstein's relation $E = m\ x\ c2\ was$ linked to **third-dimensional (mass-energy) interactions**

These expressions were not yet unified within DPT but were presented as **dimension-specific manifestations of a deeper, underlying framework**.

Furthermore, the conceptual volume emphasized that the ultimate goal of DPT is to **translate these qualitative insights into quantitative form**, enabling derivation, prediction, and experimental validation. As stated in its conclusion, the theory reaches its true beginning at the transition from ideas to formal proof.

This theoretical volume takes that next step.

Here, we move from descriptive interpretation to **mathematical formalization**, introducing precise definitions, symbolic representations, and derivations that aim to express dimensional phases, STE relationships, and force interactions in rigorous terms. The objective is to determine whether DPT can:

- Reproduce known physics as special cases
- Provide internally consistent equations
- Generate new, testable predictions

In doing so, this work transforms DPT from a conceptual framework into a candidate for formal **physical theory**.

2. THE STE MODEL

The **STE (Space–Time–Energy) Model** in DPT states that space, time, and energy are **not independent in quantities**, but **interdependent manifestations of a single underlying structure**.

- **Space** → structure of the system
- **Time** → evolution/order of changes
- **Energy** → driving mechanism of interactions
- All physical phenomena emerge from their **coupled interactions**.

Space Matrix Representation

	1	2	3	4	5	6
A						
B						
C						
D						
E						

$$A_1 \longleftrightarrow E_5$$

The Universal Matrix is defined as

$$U = [S(\iota) \int_n]$$

$$\begin{pmatrix} S(\iota)\int_1 & S(\iota)\int_2 & S(\iota)\int_3 \\ S(\iota)\int_4 & S(\iota)\int_5 & S(\iota)\int_6 \\ S(\iota)\int_7 & S(\iota)\int_8 & S(\iota)\int_9 \end{pmatrix}$$

Space-Time Graph

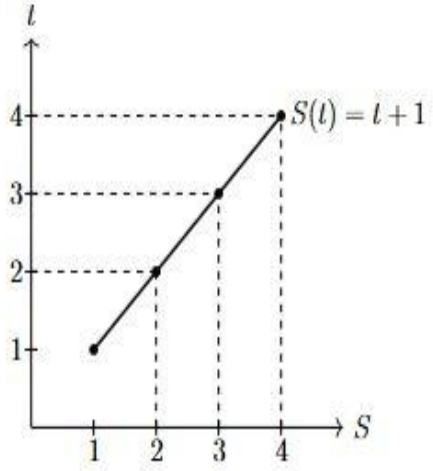


Table of Values

S	ι
0	−1
1	0
2	1
3	2
4	3

Space-Time Function

$$S(\ell) = \lim_{n \to 5} \sum_{i=1}^{n} \int_i + (\ell + 1)$$

where

$$\int_1 = 0$$

$$\int_2 = x$$

$$\int_3 = y$$

$$\int_4 = z$$

$$\int_5 = \lambda$$

Dimensional Force Definitions

$\int_1 \rightarrow$ 1st Dimension Force

$\int_2 \rightarrow$ 2nd Dimension Force

$\int_3 \rightarrow$ 3rd Dimension Force

$\int_4 \rightarrow$ 4th Dimension Force

$\int_5 \rightarrow$ 5th Dimension Force

1.1 First Dimension

Starting from

$$S(\ell) = \lim_{n \to 5} \sum_{i=1}^{1} f_i + (\ell + 1)$$

Since

$$f_1 = 0$$

then

$$S(\ell) = 0 + (\ell + 1)$$

Therefore,

$$\boxed{S(\ell) = \ell + 1}$$

1st Dimension Space-Time Function

1.2 Second Dimension

Starting from

$$S(\ell) = \lim_{n \to 5} \sum_{i=1}^{2} f_i + (\ell + 1)$$

Expanding,

$$S(\ell) = f_1 + f_2 + (\ell + 1)$$

Substituting

$$f_1 = 0$$

and

$$f_2 = x$$

gives

$$S(t) = 0 + x + (t + 1)$$

Therefore,

$$\boxed{S(t) = x + (t + 1)}$$

2nd Dimension Space-Time Function

1.3 Third Dimension

Starting from

$$S(t) = \lim_{n \to 5} \sum_{i=1}^{3} f_i + (t + 1)$$

Expanding,

$$S(t) = f_1 + f_2 + f_3 + (t + 1)$$

Substituting

$$f_1 = 0, \qquad f_2 = x, \qquad f_3 = y$$

gives

$$S(t) = 0 + x + y + (t + 1)$$

Therefore,

$$\boxed{S(t) = x + y + (t + 1)}$$

3rd Dimension Space-Time Function

1.4 Fourth Dimension

Starting from

$$S(\iota) = \lim_{n \to 5} \sum_{i=1}^{4} \int_i + (\iota + 1)$$

Expanding,

$$S(\iota) = \int_1 + \int_2 + \int_3 + \int_4 + (\iota + 1)$$

Substituting

$$\int_1 = 0, \qquad \int_2 = x, \qquad \int_3 = y, \qquad \int_4 = z$$

gives

$$S(\iota) = 0 + x + y + z + (\iota + 1)$$

Therefore,

$$\boxed{S(\iota) = x + y + z + (\iota + 1)}$$

4th Dimension Space-Time Function

1.5 Fifth Dimension

Starting from

$$S(\iota) = \lim_{n \to 5} \sum_{i=1}^{5} \int_i + (\iota + 1)$$

Expanding,

$$S(\iota) = \int_1 + \int_2 + \int_3 + \int_4 + \int_5 + (\iota + 1)$$

Substituting

$$\int_1 = 0, \qquad \int_2 = x, \qquad \int_3 = y, \qquad \int_4 = z, \qquad \int_5 = \lambda$$

gives

$$S(t) = 0 + x + y + z + \lambda + (t+1)$$

Therefore,

$$\boxed{S(t) = x + y + z + \lambda + (t+1)}$$

5th Dimension Space-Time Function

1 Integral of the Space-Time Function

The integral of the space-time function is used to determine the volume of space-time.

1.1 First Dimension

Starting with

$$S(t) = t + 1$$

Integrating,

$$\int (t+1)\,dt = \frac{t^2}{2} + t + C$$

$$\boxed{\int (t+1)\,dt = \frac{t^2}{2} + t + C}$$

1.2 Second Dimension

Starting with

$$S(t) = x + t + 1$$

Integrating,

$$\int (x+t+1)\,dt = xt + \frac{t^2}{2} + t + C$$

$$\boxed{\int (x+t+1)\,dt = xt + \frac{t^2}{2} + t + C}$$

1.3 Third Dimension

Starting with

$$S(l) = x + y + l + 1$$

Integrating,

$$\int (x + y + l + 1)\, dl = xl + yl + \frac{l^2}{2} + l + C$$

$$\boxed{\int (x + y + l + 1)\, dl = xl + yl + \frac{l^2}{2} + l + C}$$

1.4 Fourth Dimension

Starting with

$$S(t) = x + y + z + t + 1$$

Integrating,

$$\int (x + y + z + t + 1)\, dt = xt + yt + zt + \frac{t^2}{2} + t + C$$

$$\boxed{\int (x + y + z + t + 1)\, dt = xt + yt + zt + \frac{t^2}{2} + t + C}$$

1.5 Fifth Dimension

Starting with

$$S(t) = x + y + z + \lambda + t + 1$$

Integrating,

$$\int (x + y + z + \lambda + t + 1)\, dt = xt + yt + zt + \lambda t + \frac{t^2}{2} + t + C$$

$$\boxed{\int (x + y + z + \lambda + t + 1)\, dt = xt + yt + zt + \lambda t + \frac{t^2}{2} + t + C}$$

1.6 Volume of Space-Time

The integral of the space-time function is used to determine the volume of space-time, which results in energy.

In other words, the volume of space-time is equal to its energy.

Define the space-time volume as

$$V_{STE} = \int \left(\lim_{n \to 5} \sum_{i=1}^{n} \int_i + (t+1) \right) dt = E_0$$

where

$$E_0$$

is the intrinsic energy of space-time.

1.7 Energy Zero

$$E_0 = \text{Intrinsic Energy of Space-Time}$$

When calculating the volume of space-time (or Energy Zero),

$$t = \frac{s}{v}$$

where

$$s = \text{distance}$$

and

$$v = \text{velocity.}$$

For the calculations presented in this theory,

$$v = c$$

where

$$c = 3 \times 10^8 \; m/s$$

is the speed of light.

Therefore,

$$l = \frac{s}{c}$$

due to the STE Duality principle.

1 Practical Example: Energy Zero of Space-Time

Consider a space of length

$$s = 2m$$

Using

$$t = \frac{s}{c}$$

where

$$c = 3 \times 10^8 \; m/s$$

we obtain

$$t = \frac{2}{3 \times 10^8}$$

$$t \approx 6.67 \times 10^{-9} \; s$$

1.1 First Dimension

For the first dimension,

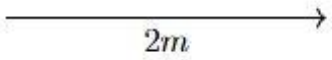


Figure 1: Geometric representation of the First Dimension.

$$S(t)_1 = t + 1$$

thus

$$V_{S(t)_1} = \int S(t)_1 \, dt = \int (t + 1) \, dt$$

$$V_{S(t)_1} = \frac{t^2}{2} + t + C$$

Substituting

$$t = 6.67 \times 10^{-9}$$

gives

$$V_{S(t)_1} = \frac{1}{2}(6.67 \times 10^{-9})^2 + 6.67 \times 10^{-9} + C$$

Since

$$\frac{1}{2}(6.67 \times 10^{-9})^2 \ll 6.67 \times 10^{-9}$$

then

$$\boxed{V_{S(t)_1} = 6.67 \times 10^{-9} + C}$$

Energy Zero in the First Dimension.

1.2 Second Dimension

For the second dimension,

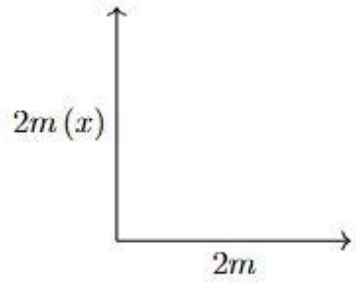


Figure 2: Geometric representation of the Second Dimension.

$$S(t)_2 = x + t + 1$$

and

$$x = 2m$$

Therefore

$$V_{S(t)_2} = \int S(t)_2 \, dt = xt + \frac{t^2}{2} + t + C$$

Substituting

$$x = 2$$

and

$$t = 6.67 \times 10^{-9}$$

gives

$$V_{S(t)_2} = 2(6.67 \times 10^{-9}) + \frac{1}{2}(6.67 \times 10^{-9})^2 + 6.67 \times 10^{-9} + C$$

$$V_{S(t)_2} \approx 2.0 \times 10^{-8} + C$$

$$\boxed{V_{S(t)_2} = 2.0 \times 10^{-8} + C}$$

Energy Zero in the Second Dimension.

1.3 Third Dimension

For the third dimension,

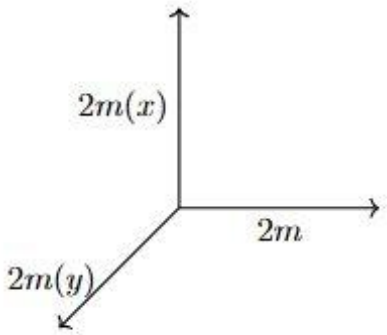


Figure 3: Geometric representation of the Third Dimension.

$$S(t)_3 = x + y + t + 1$$

with

$$x = y = 2m$$

Therefore

$$V_{S(t)_3} = xt + yt + \frac{t^2}{2} + t + C$$

Substituting

$$x = y = 2$$

and

$$t = 6.67 \times 10^{-9}$$

gives

$$V_{S(t)_3} = 2t + 2t + \frac{t^2}{2} + t + C$$

$$V_{S(t)_3} = 2(6.67 \times 10^{-9}) + 2(6.67 \times 10^{-9}) + \frac{1}{2}(6.67 \times 10^{-9})^2 + 6.67 \times 10^{-9} + C$$

$$V_{S(t)_3} \approx 3.3 \times 10^{-8} + C$$

$$\boxed{V_{S(t)_3} = 3.3 \times 10^{-8} + C}$$

Energy Zero in the Third Dimension.

1.4 Fourth Dimension

For the fourth dimension,

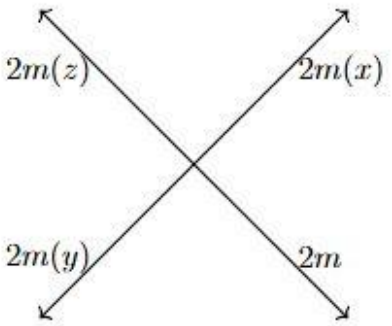


Figure 4: Geometric representation of the Fourth Dimension.

$$S(t)_4 = x + y + z + t + 1$$

with

$$x = y = z = 2m$$

Therefore

$$V_{S(t)_4} = xt + yt + zt + \frac{t^2}{2} + t + C$$

Substituting

$$x = y = z = 2$$

and

$$t = 6.67 \times 10^{-9}$$

gives

$$V_{S(t)_4} = 2t + 2t + 2t + \frac{t^2}{2} + t + C$$

$$V_{S(t)_4} \approx 4.67 \times 10^{-8} + C$$

$$\boxed{V_{S(t)_4} = 4.67 \times 10^{-8} + C}$$

Energy Zero in the Fourth Dimension.

1.5 Fifth Dimension

For the fifth dimension,

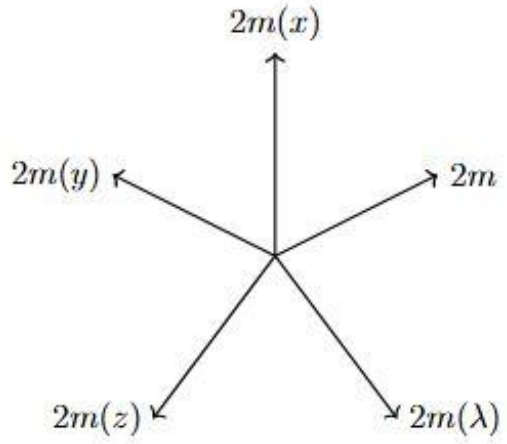


Figure 5: Geometric representation of the Fifth Dimension.

$$S(t)_5 = x + y + z + \lambda + t + 1$$

with

$$x = y = z = \lambda = 2m$$

Therefore

$$V_{S(t)_5} = xt + yt + zt + \lambda t + \frac{t^2}{2} + t + C$$

Substituting

$$x = y = z = \lambda = 2$$

and

$$t = 6.67 \times 10^{-9}$$

gives

$$V_{S(t)_5} = 2t + 2t + 2t + 2t + \frac{t^2}{2} + t + C$$

$$V_{S(t)_5} \approx 6.0 \times 10^{-8} + C$$

$$\boxed{V_{S(t)_5} = 6.0 \times 10^{-8} + C}$$

Energy Zero in the Fifth Dimension.

STE Duality (Two Faces of Existence)

STE possesses an intrinsic **duality**, forming two complementary states:

- **Active (White)** → expression of energy (motion, radiation, expansion, observable reality)
- **Passive (Black)** → stored/potential energy (stillness, contraction, latent states, hidden reality)

Reality is governed by the **continuous oscillation between these two states**, meaning:

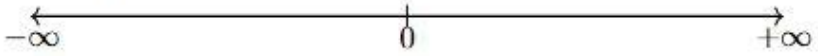
Existence = interaction between expressed energy and potential energy within the STE structure.

1 STE Duality

1.1 Visual Representation

Figure 1: STE Duality Representation

1.2 Energy Spectrum



The STE Duality is represented by

$$(-\infty,\ 0,\ +\infty)$$

which corresponds to

(Black Energy or Energy Negative, Energy Zero, White Energy or Energy Positive)

1.3 Duality Table

Black Energy	**Energy Zero**	**White Energy**
Electron	Intrinsic Energy of Space-Time	Positron
Proton		Anti-Proton
Neutron		Anti-Neutron
Black Hole		White Hole

3. THE FIRST DIMENSION

The **first dimension** in DPT represents the **quantum realm**, where energy exists in its **most fundamental and pure form**

- It is best described mathematically as a **numerical/linear system** (points → numbers).
- **Space-time is linear** → no intrinsic curvature, only points and lines.
- **Time exists only through motion** between points (no motion → no time → no existence).
- **Entities**: quantum particles (fundamental units of existence)
- **Energy form**: minimal / fundamental (linked to $E =$

1 First Dimension

1.1 Geometric Representation

The First Dimension is represented by a line extending from negative infinity to positive infinity.

$$(-\infty, +\infty)$$

where

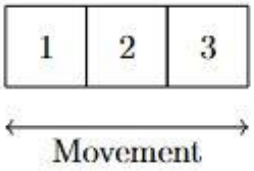
$$P_n$$

represents a point and

$$A$$

represents a line segment.

1.2 Movement Representation



1.3 Space-Time Relations

$$S = t + 1$$

where S represents Space.

$$t = S - 1$$

where t represents Time.

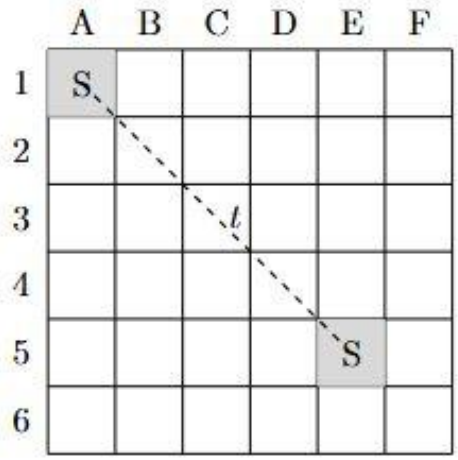
1.4 Quantum Particles

Quantum particles are represented as points in the First Dimension.

1.5 Energy Form

Energy forms are represented as line segments within the First Dimension.

1.6 Gemespasys Representation



where

$$S = \text{Space}$$

and

$$t = \text{Time}$$

The diagram represents a space-time mapping.

1.7 Gemespasys Equation

$$\text{Gemespasys} = K\, S(t)_n \frac{dt}{ds} = A'$$

where

$$A'$$

represents a single point in space-time.

If

$$A$$

is a point,
then

$$A = K\,S(t)_n$$

and therefore

$$A' = K\,S(t)_n \frac{dt}{ds}$$

1.8 Definition of K

$$K = \sum \int_n$$

or

$$K = \int_{SNS} + \int_{WNS} + \int_{EM} + \int_G + \int_V$$

where

$$\int_{SNS}$$

represents the Strong Nuclear Force,

$$\int_{WNS}$$

represents the Weak Nuclear Force,

$$\int_{EM}$$

represents the Electromagnetic Force,

$$\int_G$$

represents the Gravitational Force,
and

$$\int_V$$

represents the Vibrational Force.

Quantum Gravity in the First Dimension

As demonstrated previously by DPT, the boundary of gravity for quantum particles is the electron cloud surrounding the nucleus of the atom.

In conventional three-dimensional physics, gravity is described through the curvature of space-time. However, within the quantum realm, the behavior of gravity differs from its macroscopic representation.

In three dimensions, gravity is represented by the curvature of space-time. Within the quantum domain, this curvature approaches an infinite limit. Since the First Dimension contains only points and line segments, the geometric representation of gravity must be reformulated in terms of numerical relationships rather than spatial Curvature.

The First Dimension therefore represents gravity through the concept of infinity,

$$\infty$$

which serves as the most accurate mathematical representation of the gravitational behavior observed at the quantum scale.

- Absent in finite conditions
- **Emerges only at infinity** → leads to gravitational behavior and black holes

Infinity Between Numbers

Consider the interval between two whole numbers.
1 and 2
Although these appear as adjacent values, there are infinitely many numbers between them.
1.1, 1.01, 1.001, 1.0001, . . .
Thus,
$1 < x < 2$
contains infinitely many possible values.
Within DPT, this infinite subdivision is interpreted as the First-Dimensional manifestation of gravitational structure.

- **Uncertainty Principle origin** → inability to access past and future simultaneously

- **Quantum entanglement** explained via **Gemespasys** (connection of points in space, not distance)
- **Space = discrete points, Time = relation between them**

Curvature as Numerical Infinity

In three-dimensional space, gravity is represented by curved space-time.
In the First Dimension, curvature cannot be represented geometrically because only points and line segments exist.
Instead, curvature is represented numerically by infinity.
Consequently,
$\text{Gravity1D} \propto \infty$
and the transition between whole numbers is interpreted as movement through an infinite gravitational structure.

Matter-Energy Interpretation

Whole numbers represent discrete states of matter-energy.
For example,

1

may represent one matter-energy state, while

2

represents another.
To move from one state to another, a transition through the infinite numerical continuum is required.
This continuum corresponds to the quantum-gravitational region predicted by DPT.

Electron Cloud Boundary

The electron cloud may therefore be interpreted as the boundary between observable matter-energy states and the underlying quantum-gravitational structure.
Within this framework, gravity governs the transition between discrete matter-energy states through an infinite numerical continuum.
This interpretation forms the basis of Quantum Gravity in the First Dimension.

The first dimension is a **linear quantum system** where **existence arises from motion between points**, and **gravity and non-local phenomena emerge from infinity and dimensional interpretation**.

1st Dimension → Strong Nuclear Force

- **Role**: binds fundamental particles
- **Carrier**: gluon
- **Property**: foundational energy interaction

Observable Gravity in the First Dimension

Within the quantum realm, the curvature of space-time is no longer directly observable in the same manner as in three dimensions. Instead of observing geometric curvature, the observable quantity becomes infinity.

Therefore, DPT proposes that the First-Dimensional manifestation of gravity is represented by

$$\infty$$

rather than by a curved space-time geometry. This implies that at sufficiently small scales, the observable effect of gravity approaches an infinite numerical structure.

Black Holes as First Dimensional Objects

In the First Dimension, only points and line segments exist.

A black hole may therefore be represented as a single point within spacetime.

Let

$$P$$

represent a First-Dimensional point.

Then the limiting gravitational structure of a black hole may be represented as

$$P \rightarrow \infty$$

indicating that the point contains an infinite gravitational density.

Within DPT, black holes are interpreted as macroscopic representations of First- Dimensional infinity.

First-Dimensional Duality

By studying the First Dimension directly through numerical relationships, a deeper interpretation of duality emerges.

The STE framework suggests that reality may be represented by two complementary domains:

$$(-\infty, 0, +\infty)$$

Where

$$-\infty$$

corresponds to the negative domain,

$$0$$

corresponds to Energy Zero, and

$$+\infty$$

corresponds to the positive domain.

This duality serves as a foundation for understanding gravity, dark matter, and dark energy within DPT.

Gravity, Dark Matter and Dark Energy

Within the STE interpretation, gravity is associated with the negative side of the duality structure.

Dark matter and dark energy emerge as complementary manifestations of the same underlying framework. Symbolically,

$$\text{STE} = (-\infty, 0, +\infty)$$

with

$$\text{Gravity} \leftrightarrow -\infty$$

and

$$\text{Dark Energy} \leftrightarrow +\infty$$

Energy Zero acts as the equilibrium point separating the two domains.

Expansion and Contraction

The duality framework implies two simultaneous tendencies:

- Expansion toward positive infinity.
- Contraction toward negative infinity.
  These opposing tendencies generate the dynamic behavior of space-time and form the basis of the STE Duality model.
  The equilibrium between these tendencies is represented by

  E0

  Which corresponds to the intrinsic energy of space-time.

Summary

The First-Dimensional interpretation of gravity replaces geometric curvature with numerical infinity.

Black holes become point representations of infinite gravitational density, while the STE Duality framework provides a mechanism for interpreting gravity, dark matter, and dark energy as complementary aspects of a unified structure.

1 STE Duality, Infinity and Time

1.1 Duality Number Line

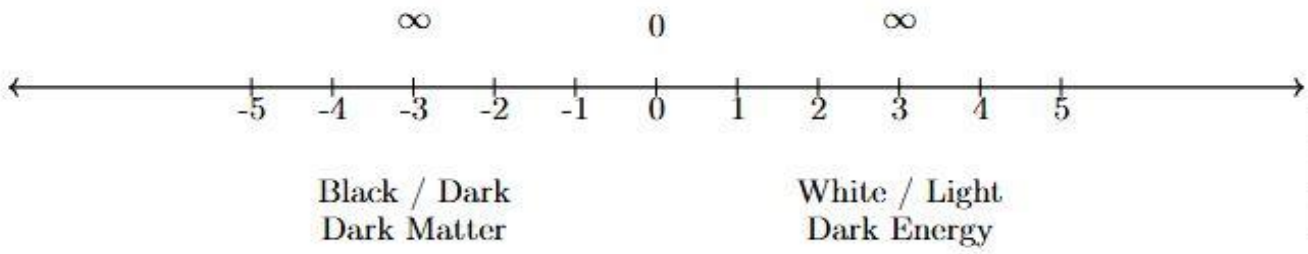


Figure 1: First-Dimensional Duality Representation

The STE duality framework is represented by

$$(-\infty, 0, +\infty)$$

where

$$-\infty$$

corresponds to the dark or negative-energy domain,

$$0$$

corresponds to Energy Zero,
and

$$+\infty$$

corresponds to the positive-energy domain.

1.2 Infinity and Successive Numbers

Consider two successive numbers

$$n$$

and

$$m$$

where

$$m = n + 1.$$

Symbolically,

$$\lim_{n \to \infty} n = m$$

where

$$n = \text{current number}$$

and

$$m = \text{next number}.$$

Within DPT, infinity represents the transition between successive states.

1.3 Examples

Moving from one state to another can be represented as

$$1 \to 2$$

$$0 \to 1$$

$$2 \to 3.$$

The transition between any two states contains an infinite number of intermediate values.

Therefore,

$$\infty$$

is interpreted as the underlying structure connecting discrete states.

1.4 Time Interpretation

Within DPT, infinity is associated with time.

Thus

$$\infty \equiv t$$

and the transition

$$0 \to \infty$$

may be interpreted as the emergence of time itself.

This leads to the symbolic relation

$$\lim_{0 \to \infty} = 1.$$

The expression is interpreted as the emergence of a first observable state from the temporal continuum.

1.5 Big Bang Interpretation in One Dimension

Within the First Dimension, the origin state

$$0$$

is interpreted as the equilibrium point of the STE duality.

The expansion from

$$0$$

toward

$$+\infty$$

generates positive states,
while expansion toward

$$-\infty$$

generates negative states.

Symbolically,

$$0 \longrightarrow (-\infty, +\infty)$$

which represents the First-Dimensional interpretation of the Big Bang.

1.6 Gravity, Dark Matter and Dark Energy

Since

$$\infty \equiv \ell,$$

gravity, dark matter and dark energy are interpreted as time-dependent manifestations of the STE structure.

The negative branch

$$-\infty$$

corresponds to gravity and dark matter,
while the positive branch

$$+\infty$$

corresponds to dark energy.
Energy Zero remains the balancing point between the two domains.

1 Gemespasys and Instantaneous Connection

1.1 Fundamental Gemespasys Relation

Recall that

$$\text{Gemespasys} = K\, S(t)_n \frac{dt}{ds} = A'$$

where

$$K = \sum \int_n$$

and

$$A'$$

represents a point in space-time.

The Gemespasys relation describes the interaction between dimensional forces and the evolution of space-time.

1.2 Space-Time Point Connection

Consider two points

$$A$$

and

$$A'$$

connected through the space-time framework.

$$A \longleftrightarrow A'$$

The connection may be represented geometrically as

$$\boxed{A \mid A'}$$

where the vertical separator represents the space-time transition between the two states.

The connection exists independently of the physical distance between the two points.

1.3 Instantaneous Interaction

Within the First Dimension, the interaction between

$$A$$

and

$$A'$$

is treated as instantaneous.
Therefore,

$$\Delta t \to 0$$

while the spatial separation remains finite.
This leads to

$$\frac{dt}{ds} \to 0.$$

Consequently, the Gemespasys relation approaches a direct point-to-point interaction.

1.4 Strong Nuclear Force Interpretation

The Strong Nuclear Force is represented by

$$\int_{SNS}.$$

Within DPT, the Strong Nuclear Force may be interpreted as the most localized manifestation of Gemespasys.
Thus,

$$\int_{SNS} \subseteq K.$$

Since

$$K = \int_{SNS} + \int_{WNS} + \int_{EM} + \int_{G} + \int_{V},$$

the Strong Nuclear Force contributes directly to the formation and stability of matter-energy states.

1.5 Matter-Energy Stability

A stable matter-energy state exists when the combined force structure remains balanced.

Symbolically,

$$\sum \int_n = \text{constant}.$$

Under this condition,

$$A = A'$$

in the sense that the space-time state remains unchanged.

Conversely,

$$A \neq A'$$

indicates a transition between states.

1.6 Space-Time Transformation

The transition from one state to another is represented as

$$A \longrightarrow A'.$$

Using Gemespasys,

$$A' = K\, S(t)_n \frac{dt}{ds}.$$

Therefore, every transformation within DPT is governed by:

$$\boxed{A' = K\, S(t)_n \frac{dt}{ds}}$$

which serves as the fundamental transformation equation of the theory.

1 Gemespasys in the Five Dimensions

Let

$$A$$

be a point in space-time.
The Gemespasys equation is

$$\text{Gemespasys} = K\, S(\iota)_n \frac{d\iota}{ds} = A'$$

where

$$K = \sum f_n$$

and

$$A'$$

represents the transformed point in space-time.

1.1 Gemespasys 1

Using

$$S(\iota)_1 = \iota + 1$$

then

$$K\, S(\iota)_1 = K(\iota + 1)$$

$$K\, S(\iota)_1 = K\iota + K$$

Therefore

$$\boxed{\text{Gemespasys}_1 = (K\iota + K)\frac{d\iota}{ds} = A'}$$

1.2 Gemespasys 2

Using

$$S(t)_2 = x + t + 1$$

then

$$K\,S(t)_2 = K(x + t + 1)$$

$$K\,S(t)_2 = Kx + Kt + K$$

Therefore

$$\boxed{\text{Gemespasys}_2 = (Kx + Kt + K)\frac{dt}{ds} = A'}$$

1.3 Gemespasys 3

Using

$$S(t)_3 = x + y + t + 1$$

then

$$K\,S(t)_3 = K(x + y + t + 1)$$

$$K\,S(t)_3 = Kx + Ky + Kt + K$$

Therefore

$$\boxed{\text{Gemespasys}_3 = (Kx + Ky + Kt + K)\frac{dt}{ds} = A'}$$

1.4 Gemespasys 4

Using

$$S(t)_4 = x + y + z + t + 1$$

then

$$K\,S(\iota)_4 = K(x + y + z + \iota + 1)$$

$$K\,S(\iota)_4 = Kx + Ky + Kz + K\iota + K$$

Therefore

$$\boxed{\text{Gemespasys}_4 = (Kx + Ky + Kz + K\iota + K)\frac{d\iota}{ds} = A'}$$

1.5 Gemespasys 5

Using

$$S(\iota)_5 = x + y + z + \lambda + \iota + 1$$

then

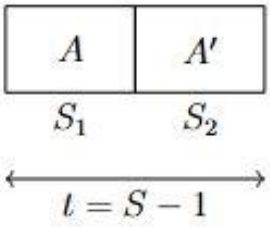
$$K\,S(\iota)_5 = K(x + y + z + \lambda + \iota + 1)$$

$$K\,S(\iota)_5 = Kx + Ky + Kz + K\lambda + K\iota + K$$

Therefore

$$\boxed{\text{Gemespasys}_5 = (Kx + Ky + Kz + K\lambda + K\iota + K)\frac{d\iota}{ds} = A'}$$

1.6 Instant Connection Representation



For example,

$$\iota = S - 1$$

and if

$$S = 2$$

then

$$t = 2 - 1 = 1.$$

Thus

$$\boxed{t = 1}$$

which represents an instant connection between

$$A$$

and

$$A'.$$

1.7 Primary Force

The primary force associated with this interaction is

$$\boxed{\int_{SNS}}$$

the Strong Nuclear Force.

1.7 Interpretation

The Gemespasys equation links:

- Dimensional forces,
- Space-time structure,
- Matter-energy states,
- State transformations.

Within the First Dimension, this relation provides the foundation for describing quantum interactions and instantaneous space-time connections.

1 Gravity in the First Dimension

1.1 Introduction

In conventional physics, gravity is represented by the curvature of space-time.

Within the First Dimension, curvature cannot exist because only points and line segments are available.

Therefore, gravity must be represented by a different mathematical structure.

DPT proposes that this structure is infinity.

$$G_{1D} \propto \infty$$

where

$$G_{1D}$$

represents gravity in the First Dimension.

1.2 Infinite Structure Between States

Consider two successive states

$$1$$

and

$$2.$$

Between these states exists an infinite number of values.

$$1.1,\ 1.01,\ 1.001,\ 1.0001, \ldots$$

Therefore

$$1 < x < 2$$

contains infinitely many possible states.

This infinite structure is identified as the First-Dimensional manifestation of gravity.

1.3 Gravity and Time

From previous sections,

$$t \equiv \infty.$$

Therefore,

$$G_{1D} \propto t.$$

Gravity becomes inseparable from the temporal structure of the space-time continuum.

The stronger the gravitational influence, the greater the temporal density associated with a state.

1.4 Point Representation

Let

$$P$$

represent a point in the First Dimension.

A gravitational point is represented as

$$P_G.$$

As gravity increases,

$$P_G \to \infty.$$

This limit represents a state of maximum gravitational density.

1.5 Graphical Representation

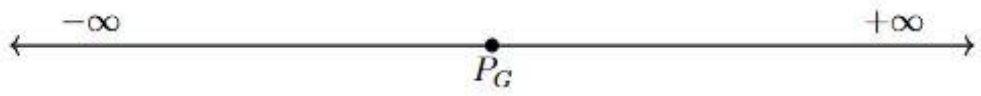


Figure 1: Gravity represented as an infinite structure in the First Dimension

1.6 Limit Formulation

The gravitational limit may be expressed as

$$\lim_{t\to\infty} P_G.$$

Likewise,

$$\lim_{G\to\infty} P_G.$$

This indicates that the point approaches an infinitely dense gravitational state.

1.7 Black Hole Interpretation

Within DPT, a black hole is interpreted as the macroscopic manifestation of a First-Dimensional gravitational point.

Thus

$$BH \equiv P_G.$$

and

$$BH \to \infty.$$

The singularity observed in black holes is therefore interpreted as a First-Dimensional gravitational structure.

1.8 Space-Time Form

Using the space-time relation

$$S(\iota) = \iota + 1,$$

gravity can be embedded directly into the space-time framework.

Therefore,

$$S_G(\iota) = G + \iota + 1.$$

As

$$G \to \infty,$$

the space-time structure approaches an infinite state.

$$\lim_{G \to \infty} S_G(l) = \infty.$$

1.9 Conclusion

Within the First Dimension, gravity is represented by infinity rather than geometric curvature.

The infinite structure between states serves as the First-Dimensional manifestation of gravitational behavior and forms the basis for later dimensional formulations of gravity.

1 Final Formulation of Gravity in the First Dimension

1.1 Gravity and Infinity

From the previous derivations,

$$G_{1D} \propto \infty.$$

Gravity in the First Dimension is therefore represented through an infinite numerical structure rather than geometric curvature.

As infinity increases,

$$\lim_{\infty \to \infty} G_{1D} = \infty.$$

Thus the gravitational structure remains unbounded.

1.2 Gravity and Time

Since

$$t \equiv \infty,$$

gravity can also be expressed as

$$G_{1D} \propto t.$$

Therefore,

$$G_{1D} = k\,t$$

where

$$k$$

is a proportionality constant.

This relation connects gravity directly to the temporal structure of space-time.

1.3 Gravity and Space

Using

$$S = \iota + 1,$$

we obtain

$$\iota = S - 1.$$

Substituting into the gravity relation,

$$G_{1D} = k(S - 1).$$

Therefore gravity may be represented directly as a function of space.

$$\boxed{G_{1D} = k(S - 1)}$$

1.4 Combined Space-Time Gravity Function

Combining gravity with the space-time function yields

$$S_G(\iota) = G + \iota + 1.$$

Substituting

$$G = k\,\iota,$$

gives

$$S_G(\iota) = k\iota + \iota + 1.$$

Factoring,

$$S_G(\iota) = (k + 1)\iota + 1.$$

Thus,

$$\boxed{S_G(\iota) = (k + 1)\iota + 1}$$

represents the gravitational space-time function for the First Dimension.

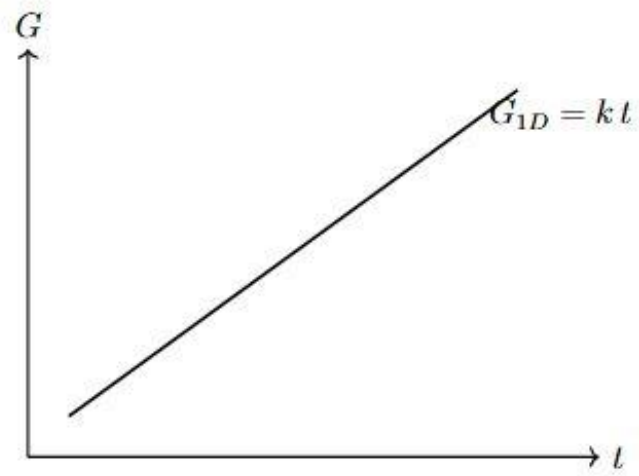


Figure 1: Linear relation between Gravity and Time in the First Dimension

1.5 Graphical Interpretation

1.6 Black Hole Limit

For a black hole,

$$G_{BH} \to \infty.$$

Therefore,

$$S_G(t) \to \infty.$$

and

$$t \to \infty.$$

The black hole becomes the limiting case of the First-Dimensional gravitational framework.

Symbolically,

$$BH = \lim_{G \to \infty} G_{1D}.$$

1.7 Connection with STE Duality

The STE Duality framework

4. THE SECOND DIMENSION

The **second dimension** in DPT represents the **geometric/molecular realm**, where reality is structured through **forms and curvature**

- It is best described as a **geometric system** (figures, surfaces, closed forms).
- **Space is inherently curved** → gravity appears naturally.
- **Time = lines (can be curved)** → time itself is affected by energy.
- **Entities**: molecules / geometric figures
- **Energy form**: represented by **circumference (boundary field)**
- **Matter**: enclosed geometric structures (e.g., triangle = fundamental unit)
- **Triangle = fundamental particle** (all structures reducible to it)
- **Prime numbers (1D) ↔ triangles (2D)** correspondence
- **Wave–particle duality** → interaction between figure (particle) and enclosed space (wave)
- **Gravity = curvature of space (via circumference/geometry)**

The second dimension is a **curved geometric system** where **energy defines boundaries, matter forms structures, and gravity emerges intrinsically from curvature**.

2nd Dimension → Weak Nuclear Force

- **Role**: transformation and decay
- **Carriers**: W, Z bosons
- **Property**: state transitions of matter

1 Second Dimension

1.1 Geometric Figures

The Second Dimension introduces closed geometric structures.

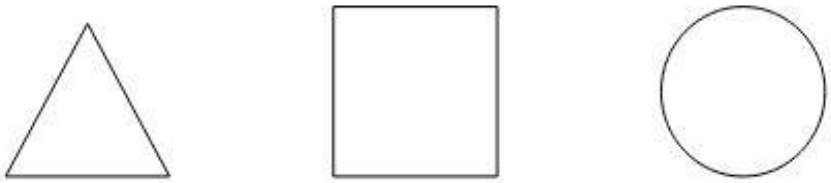


Figure 1: Basic geometric figures in the Second Dimension

The fundamental properties are defined as:

$$\text{Circumference} \longrightarrow \text{Full Energy}$$

$$\text{Sides} \longrightarrow \text{Frequency}$$

$$\text{Space-Time} \longrightarrow \text{Vibration}$$

1.2 Space-Time as Vibration

In the Second Dimension, space-time is represented as a vibration.

Figure 2: Space-Time Vibration

1.3 Energy Representation

Energy is represented by polygons inscribed within a circle.

The circumference represents the total available energy, while the polygon represents condensed or structured energy.

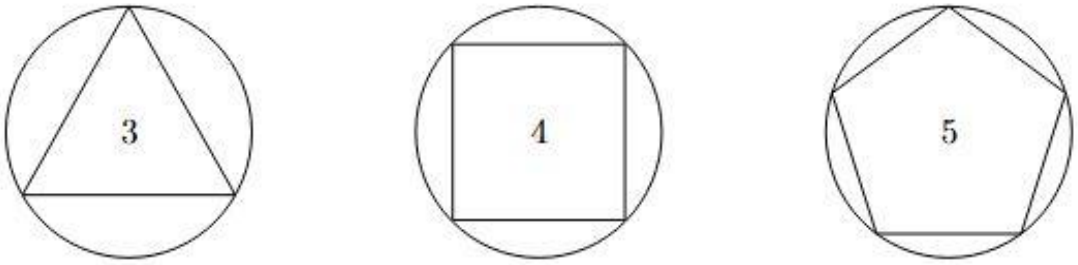


Figure 3: Polygonal representations of energy

1.4 Mass and Energy

Within the Second Dimension:

$$\text{Polygons} \longrightarrow \text{Mass}$$

$$\text{Circumference} \longrightarrow \text{Non-Zero Energy}$$

$$\text{Mass} \longrightarrow \text{Solidified Energy}$$

The circle represents the complete energy structure, while the polygon represents the portion of that energy condensed into a stable form.

1.5 Numerical Representation

In the First Dimension, numbers represent non-zero energy states.

Similarly, in the Second Dimension, polygons represent non-zero energy states through geometric structures.

Thus,

$$\text{Number} \leftrightarrow \text{First Dimension}$$

and

$$\text{Polygon} \leftrightarrow \text{Second Dimension.}$$

As the number of polygon sides increases,

$$n \to \infty,$$

the polygon approaches a perfect circle.

$$\lim_{n\to\infty} \text{Polygon}_n = \text{Circle}.$$

This relationship connects mass, energy, frequency, and space-time vibration within the Second Dimension.

1 Unity, Prime Numbers and Geometric Structures

1.1 Numbers in the First Dimension

The First Dimension may be represented by the sequence

$$0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, \ldots, \infty$$

where each number represents a non-zero energy state.

1.2 Energy Zero

Energy Zero is represented by

$$0.$$

$$0 \longrightarrow \text{Energy Zero}$$

It corresponds to the intrinsic energy of space-time discussed previously in DPT.

1.3 Unity

Unity is represented by

$$1.$$

$$1 \longrightarrow \text{Unity}$$

Within DPT, unity is the fundamental building block from which all numbers are formed.

Since every integer can be decomposed into units,

$$n = 1 + 1 + 1 + \cdots + 1,$$

unity serves as the elementary component of numerical structure.

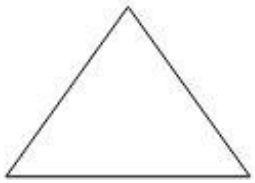


Figure 1: Unity represented by a triangle

1.4 Geometric Representation of Unity

In the Second Dimension, unity is represented by a triangle.

Thus

$$1 \leftrightarrow \triangle$$

and the triangle becomes the fundamental geometric unit of the Second Dimension.

1.5 Construction from Unity

Larger geometric structures may be formed by combining multiple units.

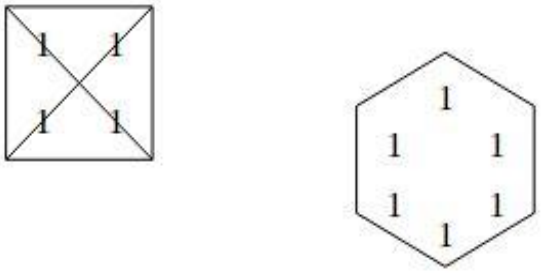


Figure 2: Structures formed from repeated units

1.6 Prime Numbers

Prime numbers are formed by unity and cannot be divided into equal groups by any number other than unity and themselves.

If

$$p$$

is prime,

then

$$p = 1 + \cdots + 1$$

with

$$p$$

copies of unity.
Examples include

$$2,\ 3,\ 5,\ 7,\ 11,\ 13, \ldots$$

Prime numbers represent fundamental numerical structures.

1.7 Composite Numbers

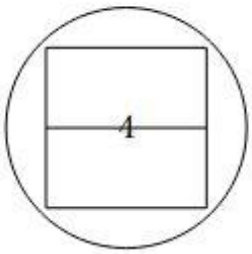
Composite numbers may be decomposed into smaller structures.
For example,

$$4 = 2 + 2$$

and

$$9 = 3 + 3 + 3.$$

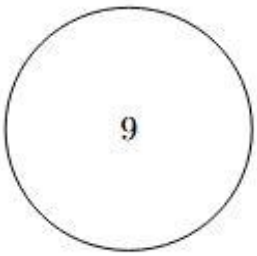
These relationships may be represented geometrically.



$\Rightarrow \qquad 4 = 2 + 2$

1.8 Prime Numbers and Molecular Structure

Within DPT, prime numbers are interpreted as fundamental building blocks of larger structures.
Thus, complex structures arise through combinations of prime components.



$$\Rightarrow \qquad 9 = 3 + 3 + 3$$

Symbolically,

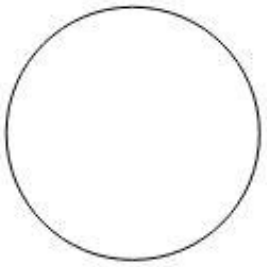
$$\text{Prime Numbers} \longrightarrow \text{Molecular Structures.}$$

Prime numbers therefore serve as the elementary constituents from which more complex geometric and energetic configurations are formed.

1 Second-Dimensional Gravity

1.1 Area and Energy

Consider the area of a circle



$= E$

Figure 1: Energy represented by a circular area

$$A = \pi r^2.$$

Within DPT:

$$A \longrightarrow E$$

where

$$E$$

represents energy.
Thus,

$$E = \pi r^2.$$

1.2 Gravity Radius

In DPT, the radius of the circle represents the range of gravity.
Therefore,

$$r \longrightarrow g.$$

Substituting,

$$E = \pi g^2.$$

Solving for gravity,

$$g^2 = \frac{E}{\pi}$$

and

$$g = \sqrt{\frac{E}{\pi}}.$$

This may be rewritten as

$$g = \frac{1}{\sqrt{\pi}}\sqrt{E}.$$

1.3 Dimensional Gravity Constant

Define

$$X_2 = \frac{1}{\sqrt{\pi}}.$$

Then

$$g = X_2 E^{1/2}.$$

The constant

$$X_2$$

is the Second-Dimensional Gravity Constant.

1.4 General Gravity Formula

The general DPT gravity relation is

$$\boxed{G = X_n E^{1/n}}$$

where

$$X_n$$

is the dimensional gravity constant and

$$n$$

is the dimensional number.

1.5 First-Dimensional Gravity

For the First Dimension,

$$G = X_1 E.$$

Using

$$X_1 = \frac{1}{2}$$

gives

$$G = \frac{1}{2} E.$$

Therefore

$$\boxed{G_{1D} = \frac{1}{2} E}$$

which is the First-Dimensional gravity equation.

1.6 Second-Dimensional Gravity

For the Second Dimension,

$$G = X_2 E^{1/2}.$$

Using

$$X_2 = \frac{1}{\sqrt{\pi}}$$

gives

$$G = \frac{1}{\sqrt{\pi}} \sqrt{E}.$$

Therefore

$$\boxed{G_{2D} = \frac{1}{\sqrt{\pi}} \sqrt{E}}$$

which is the Second-Dimensional gravity equation.

1 Practical Example: Gravity Range of Molecular Hydrogen

Recall the general gravity equation

$$G = X_n E^{1/n}$$

and the Second-Dimensional form

$$G = X_2 E^{1/2}$$

where

$$X_2 = \frac{1}{\sqrt{\pi}}.$$

1.1 Total Energy

The total energy is defined as

$$E = E_\Delta + \tilde{E}$$

where

$$E_\Delta = mc^2$$

represents mass-energy,
and

$$\tilde{E} = hf$$

represents massless energy.
If

$$f = 0,$$

then

$$\tilde{E} = 0$$

and therefore

$$E = mc^2.$$

1.2 Molecular Hydrogen

Consider molecular hydrogen

$$H_2.$$

The molar mass is

$$H_2 = 2.016\ g/mol.$$

Using Avogadro's number,

$$N_A = 6.022 \times 10^{23},$$

the mass of one molecule is

$$m = \frac{2.016}{6.022 \times 10^{23}}$$

$$m \approx 3.35 \times 10^{-24}\ g.$$

Converting to kilograms,

$$m = 3.35 \times 10^{-27}\ kg.$$

1.3 Energy Calculation

Using

$$E = mc^2,$$

and

$$c = 3 \times 10^8\ m/s,$$

gives

$$E = (3.35 \times 10^{-27})(3 \times 10^8)^2.$$

Therefore,

$$E = 3.015 \times 10^{-10}\ J.$$

1.4 Gravity Calculation

Using

$$G = \frac{1}{\sqrt{\pi}}\sqrt{E},$$

substitute the energy value:

$$G = \frac{1}{\sqrt{\pi}}\sqrt{3.015 \times 10^{-10}}.$$

Evaluating,

$$G \approx 9.8 \times 10^{-6}\sqrt{J}.$$

Thus

$$\boxed{G = 9.8 \times 10^{-6}\sqrt{J}}$$

which is the Second-Dimensional gravity range for a single molecule of hydrogen according to DPT.

1.5 Unit Analysis

Since

$$J = \frac{kg\ m^2}{s^2},$$

then

$$\sqrt{J} = \sqrt{\frac{kg\ m^2}{s^2}}.$$

Therefore

$$\sqrt{J} = \frac{\sqrt{kg}\ m}{s}.$$

Substituting,

$$G = 9.8 \times 10^{-6}\frac{\sqrt{kg}\ m}{s}.$$

Hence

$$\boxed{G = 9.8 \times 10^{-6} kg^{1/2} \frac{m}{s}}$$

which is equivalent to the previous result.

1.6 Final Result

The gravity range obtained for molecular hydrogen is

$$\boxed{G = 9.8 \times 10^{-6} \sqrt{J}}$$

or equivalently

$$\boxed{G = 9.8 \times 10^{-6} kg^{1/2} \frac{m}{s}.}$$

1 Unit of Gravity in DPT

Recall the general gravity equation

$$G = X_n E^{1/n}$$

where

$$n$$

represents the dimensional number.

1.1 Gravity Units

Since

$$E = \text{Energy}$$

and energy is measured in Joules,

$$E = (Joules)$$

then

$$G = (Joules)^{1/n}.$$

Therefore

$$[G] = (J)^{1/n}.$$

Using SI units,

$$J = \frac{kg \cdot m^2}{s^2},$$

thus

$$[G] = \left(\frac{kg \cdot m^2}{s^2}\right)^{1/n}.$$

or

$$[G] = \left(M\, L^2\, T^{-2}\right)^{1/n}.$$

1.8 Fundamental Magnitudes

Within DPT, the universe is described by three fundamental magnitudes:

$$M \rightarrow \text{Mass}$$

$$S \rightarrow \text{Space}$$

$$T \rightarrow \text{Time}$$

These symbols represent the three primitive magnitudes of DPT and should not be confused with the dimensional-analysis notation used in conventional physics.

1.2 STE Representation

Within the STE framework,

$$E = \frac{M\,S^2}{T^2},$$

therefore

$$G = \left(\frac{E\,S^2}{T^2}\right)^{1/n}.$$

1.3 Dimensional Interpretation

The dimensional number

$$n$$

determines the gravity scaling law.
For example,

$$G_{1D} = X_1 E$$

$$G_{2D} = X_2 E^{1/2}$$

$$G_{3D} = X_3 E^{1/3}$$

and so on.

1.4 One-Dimensional Representation

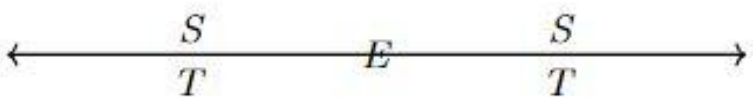


Figure 1: One-Dimensional Energy Representation

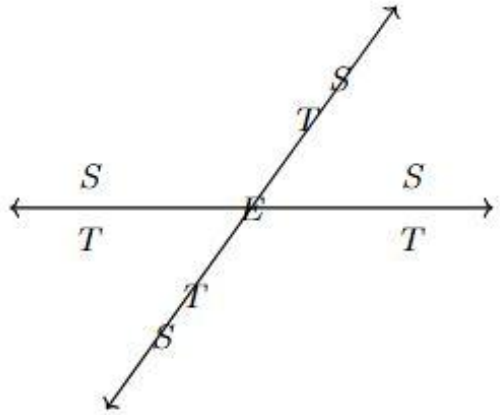


Figure 2: Two-Dimensional Energy Representation

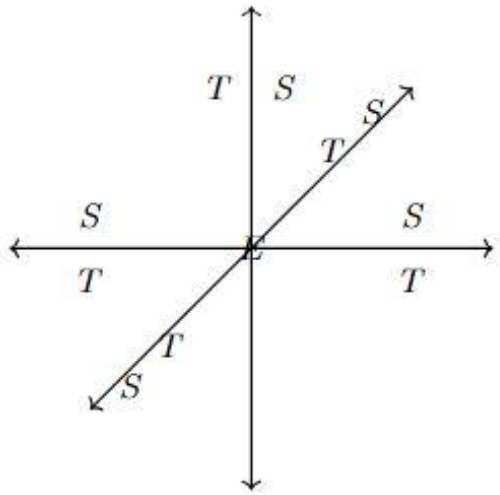


Figure 3: Three-Dimensional Energy Representation

1.5 Two-Dimensional Representation

1.6 Three-Dimensional Representation

1.7 Conclusion

Therefore the unit of gravity in DPT is

$$\boxed{[G] = (J)^{1/n}}$$

or equivalently

$$[G] = \left(\frac{kg \cdot m^2}{s^2}\right)^{1/n}.$$

5. THE THIRD DIMENSION

The **third dimension** in DPT represents the **macroscopic physical world**, where energy and matter are **directly observable and measurable**.

- It is a **3D spatial system** (length, width, height).
- Governed by **classical and relativistic physics**.
- **Energy is tangible** → linked to $E = m \times c^2$.
- **Entities**: biological life (cells, humans, matter systems)
- **Energy form**: mass-energy (visible, measurable)
- **Forces**: dominated by electromagnetism and classical interactions
- **Space-time = unified continuum** (Einstein)
- **Gravity = curvature of space-time** (but dimensionally incomplete in DPT)
- Observable physics = **emergent behavior of deeper dimensional interactions**

The third dimension is the **observable reality**, where **mass-energy interactions define physical laws**, but these laws are **projections of deeper dimensional structures**.

3rd Dimension → Electromagnetic Force

- **Role**: interaction of matter, light, and energy
- **Carrier**: photon
- **Property**: balance of attraction/repulsion

1 Third Dimension

The Third Dimension introduces three independent spatial axes.

$$X,\ Y,\ Z$$

Together these axes create the complete three-dimensional space-time framework.

1.1 Full Three-Dimensional System

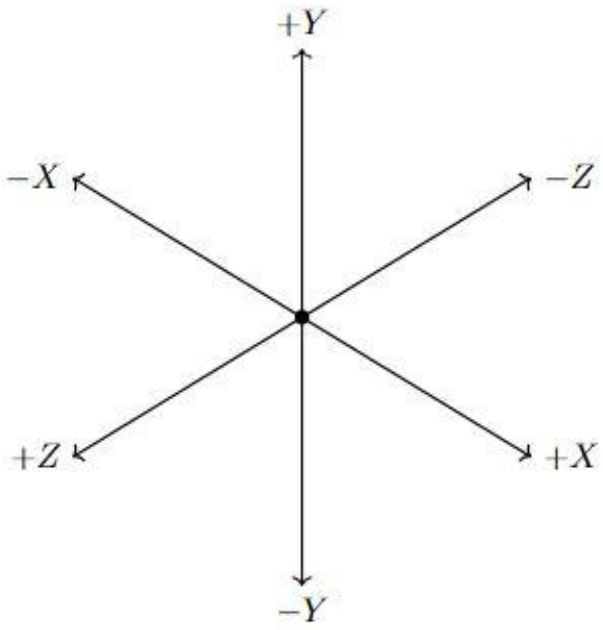


Figure 1: Full Three-Dimensional Coordinate System

The complete Third Dimension contains both positive and negative directions along each spatial axis:

$$(\pm X, \pm Y, \pm Z).$$

1.2 Three-Dimensional Spatial System

A point in three-dimensional space is represented by

$$P = (x, y, z).$$

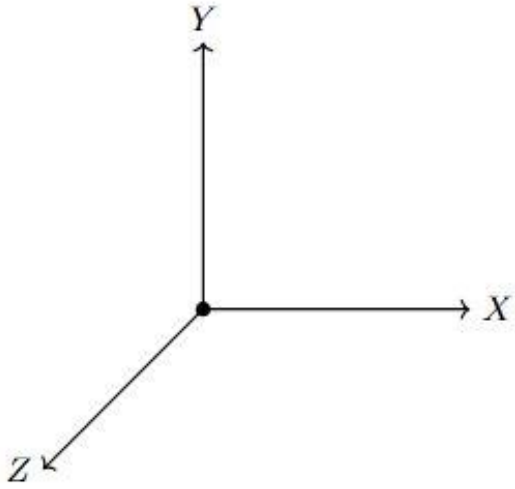


Figure 2: Three-Dimensional Spatial System

1.3 Space-Time Representation in Three Dimensions

Space-time in the Third Dimension is represented by a cube.

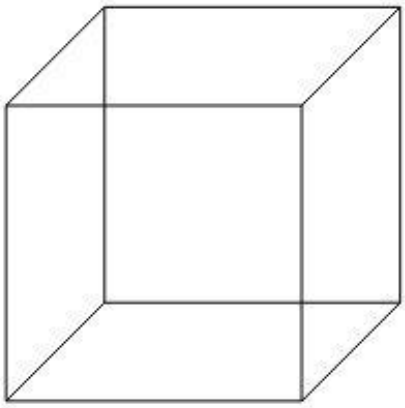


Figure 3: Space-Time Representation in Three Dimensions

The cube represents a finite region of three-dimensional space-time containing length, width, and height.

The spatial volume is

$$V = LWH$$

where

$$L = \text{Length},$$

$$W = \text{Width},$$

and

$$H = \text{Height}.$$

The Third Dimension therefore extends the line of the First Dimension and the plane of the Second Dimension into a volumetric space-time structure.

1 Gravity in the Third Dimension

1.1 Spherical Representation

In the Third Dimension, energy is represented by a sphere.

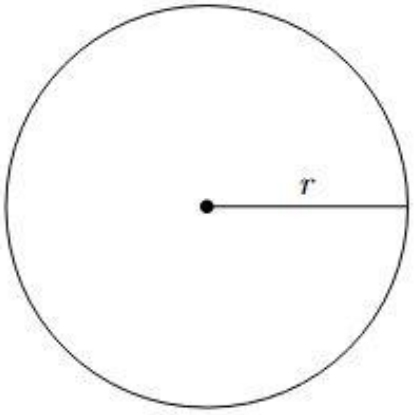


Figure 1: Spherical representation of energy

The sphere represents a three-dimensional energy structure.

1.2 Volume of a Sphere

The volume of a sphere is

$$V = \frac{4}{3}\pi r^3.$$

Within DPT,

$$V \longrightarrow E$$

where

$$E$$

represents energy.
The radius represents the gravitational range:

$$r \longrightarrow g.$$

Therefore

$$E = \frac{4}{3}\pi g^3.$$

1.3 Solving for Gravity

Solving for

$$g$$

gives

$$g^3 = \frac{3E}{4\pi}.$$

Taking the cube root,

$$g = \sqrt[3]{\frac{3E}{4\pi}}.$$

Separating the constant,

$$g = \sqrt[3]{\frac{3}{4\pi}}\sqrt[3]{E}.$$

1.4 Third-Dimensional Gravity Constant

Define

$$X_3 = \sqrt[3]{\frac{3}{4\pi}}.$$

Then

$$g = X_3 E^{1/3}.$$

Thus,

$$\boxed{G = X_3 E^{1/3}}$$

which is the gravity equation for the Third Dimension.

1.5 Relation to the General Formula

Recall the general DPT gravity equation:

$$G = X_n E^{1/n}.$$

For

$$n = 3,$$

the equation becomes

$$G = X_3 E^{1/3}.$$

Using

$$X_3 = \sqrt[3]{\frac{3}{4\pi}},$$

we obtain

$$\boxed{G_3 = \sqrt[3]{\frac{3}{4\pi}} E^{1/3}}$$

which represents gravity in the Third Dimension.

1.6 Third-Dimensional Gravity Constant

$$\boxed{X_3 = \sqrt[3]{\frac{3}{4\pi}}}$$

where

$$E = \text{Energy}.$$

1 Practical Example and Theoretical Verification

1.1 DPT Gravity of the Sun

Let us calculate the DPT gravity of the Sun.

The mass of the Sun is

$$m_{\odot} = 1.9885 \times 10^{30}\ kg.$$

1.2 Third-Dimensional Gravity Equation

Recall

$$G = X_3 E^{1/3}$$

with

$$X_3 = \sqrt[3]{\frac{3}{4\pi}} \approx 0.62.$$

1.3 Energy Calculation

The total energy is

$$E = E_{\Delta} + \tilde{E}.$$

Assuming

$$\int = 0,$$

then

$$\tilde{E} = 0,$$

and therefore

$$E = mc^2.$$

Substituting the solar mass,

$$E = (1.9885 \times 10^{30})(3 \times 10^{8})^2.$$

Thus

$$E = 1.79 \times 10^{47}\ J.$$

1.4 Gravity Calculation

Using

$$G = X_3 E^{1/3},$$

gives

$$G = (0.62)(1.79 \times 10^{47})^{1/3}.$$

Evaluating,

$$G \approx 3.51 \times 10^{15} J^{1/3}.$$

Therefore,

$$\boxed{G = 3.51 \times 10^{15} J^{1/3}}$$

which represents the DPT gravity range of the Sun.

1.5 Interpretation

The result

$$G = 3.51 \times 10^{15} J^{1/3}$$

represents the cubic geometric projection of the Sun's energy within the Third Dimension.

Within DPT, gravity is interpreted as an emergent geometric property of energy density rather than a force acting at a distance.

1 Postulate of Gravity Radius Equivalence

1.1 DPT Postulate

Within Dimensional Physics Theory, gravity is interpreted as a geometric manifestation of energy.

For an object existing in the n-th dimension, the gravity quantity

$$G = X_n E^{1/n}$$

represents the characteristic geometric radius generated by the energy distribution of the object.

Therefore, the quantity

$$E^{1/n}$$

is not interpreted merely as an energy unit, but as the fundamental geometric extension of energy within the n-th dimension.

Consequently, DPT adopts the following equivalence:

$$\boxed{J^{1/n} \equiv m}$$

when evaluating gravitational range.

For the Third Dimension,

$$\boxed{J^{1/3} \equiv m}$$

and therefore

$$G_3 = X_3 E^{1/3}$$

may be interpreted directly as a gravitational radius measured in meters.

1.2 Physical Interpretation

This postulate states that energy possesses an intrinsic geometric projection.

In the Third Dimension, the cube-root projection of energy corresponds to a physical spatial radius.

Thus,

$$G_3 = X_3 E^{1/3}$$

represents the maximum spatial extent of the object's gravitational domain. The gravity value is therefore both:

$$\text{Gravity Magnitude}$$

and

$$\text{Gravity Radius.}$$

1.3 Application

Using this postulate,

$$3.49 \times 10^{15} J^{1/3}$$

is interpreted as

$$3.49 \times 10^{15} m,$$

allowing direct comparison with astronomical distances such as Astronomical Units, light-years, and Oort Cloud scales.

2 Interpretation of the Solar Gravity Radius

2.1 Unit Analysis

Recall that

$$J = \frac{kg \cdot m^2}{s^2}.$$

Therefore,

$$J^{1/3} = \left(\frac{kg \cdot m^2}{s^2}\right)^{1/3}.$$

Using the DPT fundamental magnitudes

$$M = \text{Mass},$$

$$S = \text{Space},$$

$$T = \text{Time},$$

the gravity unit becomes

$$J^{1/3} = \left(\frac{M\,S^2}{T^2}\right)^{1/3}.$$

2.2 Three-Dimensional Representation

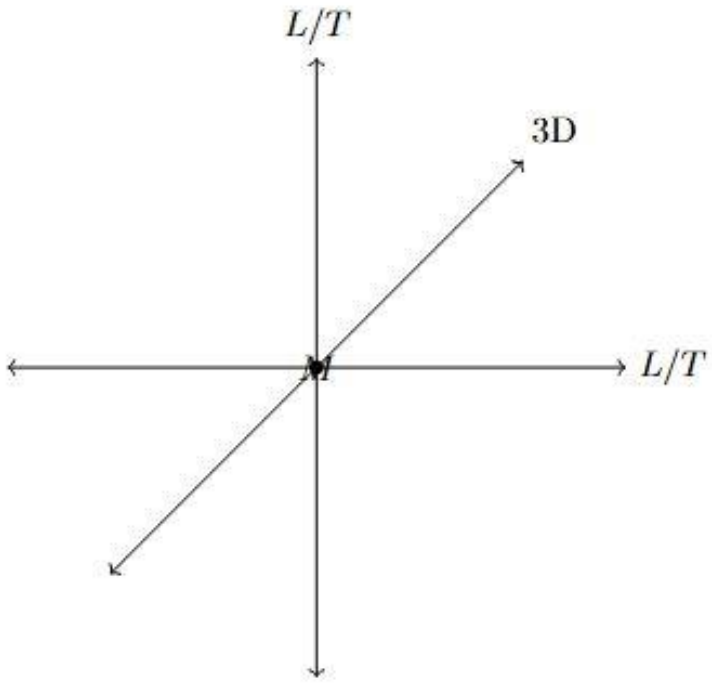


Figure 1: Three-Dimensional Energy Expansion from a Mass Source

2.3 Solar Gravity Radius

From the previous calculation,

$$G_\odot = 3.49 \times 10^{15} J^{1/3}.$$

Within DPT, the gravity value is interpreted as a gravity radius. Thus,

$$R_G = 3.49 \times 10^{15}.$$

If interpreted as meters,

$$R_G = 3.49 \times 10^{15}\ m.$$

2.4 Conversion to Astronomical Units

Using

$$1\ AU = 1.496 \times 10^{11}\ m,$$

we obtain

$$R_G = \frac{3.49 \times 10^{15}}{1.496 \times 10^{11}} AU.$$

Therefore,

$$R_G \approx 2.33 \times 10^{4}\ AU.$$

or

$$\boxed{R_G \approx 23300\ AU}$$

2.5 Oort Cloud Comparison

A distance of approximately

$$23300\ AU$$

lies within the region commonly associated with the Oort Cloud.

Therefore, the DPT gravity radius of the Sun is of the same order of magnitude as the outer Solar System gravitational domain.

This correspondence is taken as a qualitative verification of the Third-Dimensional gravity equation.

1 Photon Equivalent of Solar Gravity

1.1 Objective

We now investigate whether the DPT gravity equation can be applied to massless particles.

The goal is to determine how many photons would be required to produce the same DPT gravity value previously obtained for the Sun.

1.2 Solar Gravity Result

From the previous calculation,

$$G_{\odot} = X_3 E^{1/3}$$

with

$$X_3 = \sqrt[3]{\frac{3}{4\pi}} \approx 0.62035$$

and

$$E_{\odot} = m_{\odot} c^2 = 1.79 \times 10^{47} J.$$

This produced

$$G_{\odot} = 3.49 \times 10^{15} J^{1/3}.$$

1.3 Photon Energy Formulation

The energy of a collection of photons is

$$E_{\gamma} = Nhf$$

where

$$N = \text{number of photons},$$

$$h = 6.626 \times 10^{-34}\ J \cdot s,$$

and

f = photon frequency.

Substituting into the DPT gravity equation gives

$$G = X_3(Nhf)^{1/3}.$$

1.4 Equivalent Gravity Condition

To produce the same DPT gravity as the Sun,

$$X_3(Nhf)^{1/3} = X_3(mc^2)^{1/3}.$$

Cancelling X_3,

$$(Nhf)^{1/3} = (mc^2)^{1/3}.$$

Cubing both sides,

$$Nhf = mc^2.$$

Solving for N,

$$N = \frac{mc^2}{hf}.$$

1.5 Numerical Calculation

Using

$$mc^2 = 1.79 \times 10^{47} J,$$

and assuming visible-light photons with

$$f = 6 \times 10^{14} Hz,$$

gives

$$N = \frac{1.79 \times 10^{47}}{(6.626 \times 10^{-34})(6 \times 10^{14})}.$$

The energy of one photon is

$$hf = 3.976 \times 10^{-19} J.$$

Therefore,

$$N = 4.50 \times 10^{65}.$$

Thus,

$$\boxed{N = 4.50 \times 10^{65} \text{ photons}}$$

contain approximately the same total energy as the Sun's rest-mass energy.

1.6 Interpretation

Within DPT, gravity depends only on total energy through

$$G = X_3 E^{1/3}.$$

Therefore any system possessing the same total energy will produce the same DPT gravity value regardless of whether the energy is stored as mass or as radiation.

Consequently,

$$4.50 \times 10^{65}$$

visible-light photons produce the same DPT gravity value as

$$1.9885 \times 10^{30} kg$$

of solar mass.

1.7 Comparison with Solar Radiation

The Sun is estimated to emit approximately

$$3 \times 10^{62}$$

visible-light photons during its main-sequence lifetime.

Comparing with the DPT result,

$$\frac{4.50 \times 10^{65}}{3 \times 10^{62}} \approx 1.5 \times 10^{3}.$$

Therefore the equivalent photon count required to match the Sun's rest-mass energy is approximately

1500

times larger than the estimated number of visible photons emitted by the Sun during its lifetime.

This comparison illustrates the enormous difference between the Sun's total mass-energy reservoir and the fraction of that energy radiated as visible light.

0.1 Comparison with Future Solar Photon Production

According to astrophysical estimates, the total number of photons that the Sun is expected to emit over its remaining lifetime is approximately of the order

$$N_{\text{future}} \sim 10^{65}$$

photons.

Comparing this estimate with the DPT result

$$N_{\text{DPT}} = 4.50 \times 10^{65},$$

we observe that both values lie within the same order of magnitude.

0.2 Interpretation

The agreement in order of magnitude suggests that the DPT gravity formulation provides a consistent relationship between mass-energy and photon-energy descriptions.

The DPT gravity equation

$$G = X_3 E^{1/3}$$

can therefore be applied to systems composed of massive bodies through

$$E = mc^2,$$

as well as systems composed of massless particles through

$$E = Nhf.$$

Since both descriptions depend upon total energy, DPT predicts that equal energies produce equal gravity values regardless of the physical form in which the energy is stored.

Consequently,

$$X_3(mc^2)^{1/3} = X_3(Nhf)^{1/3}$$

whenever

$$mc^2 = Nhf.$$

This result establishes a direct connection between massive and massless energy systems within the DPT framework.

0.3 Potential Implications

The correspondence between the DPT photon estimate

$$4.50 \times 10^{65}$$

and astrophysical estimates of solar photon production suggests that DPT may contain information related to stellar evolution.

At present, this observation should be regarded as a numerical consistency check rather than a proof.

Further studies involving stars of different masses and known lifetimes would be required to determine whether DPT can be used as a predictive model for stellar evolution or photon production.

1 DPT Hill Radius Formula

Starting from the classical Hill Radius equation

$$r_H = a\left(\frac{m}{3M}\right)^{1/3},$$

where

$$a = \text{distance between the bodies,}$$

$$m = \text{smaller body mass,}$$

$$M = \text{larger body mass.}$$

Recall that in DPT,

$$G = X_3(mc^2)^{1/3}.$$

Therefore,

$$\frac{G_2}{G_1} = \left(\frac{M_2}{M_1}\right)^{1/3}.$$

Substituting into the Hill Radius equation,

$$\boxed{r_H = a\frac{1}{3^{1/3}}\frac{G_2}{G_1}}$$

where

$$G_1 = \text{gravity of the larger body,}$$

$$G_2 = \text{gravity of the smaller body.}$$

This becomes the DPT Hill Radius Formula.

2 Earth-Sun Hill Radius

Known values:

$$G_\odot = 3.49 \times 10^{15} J^{1/3},$$

$$G_E = 5.04 \times 10^{13} J^{1/3}.$$

Distance between Earth and Sun:

$$a = 1AU = 1.496 \times 10^{11} m.$$

Gravity ratio:

$$\frac{G_E}{G_\odot} = \frac{5.04 \times 10^{13}}{3.49 \times 10^{15}} = 0.01444.$$

Also,

$$3^{1/3} = 1.442.$$

Substituting into the DPT Hill Radius equation,

$$r_H = (1.496 \times 10^{11}) \frac{1}{1.442} (0.01444).$$

Therefore,

$$r_H = 1.50 \times 10^9 m.$$

Converting to kilometers,

$$\boxed{r_H = 1.50 \times 10^6 km}$$

2.1 Interpretation

The documented Hill Radius of the Earth is approximately

$$1.5 \times 10^6 km.$$

The DPT calculation gives

$$1.50 \times 10^6 km.$$

Thus the DPT formulation reproduces the classical Hill Radius to high precision.

3 Moon-Earth Hill Radius

Known values:

$$G_M = 1.17 \times 10^{13} J^{1/3},$$

$$G_E = 5.04 \times 10^{13} J^{1/3}.$$

Gravity ratio:

$$\frac{G_M}{G_E} = \frac{1.17 \times 10^{13}}{5.04 \times 10^{13}} = 0.232.$$

Average Earth–Moon distance:

$$a = 3.844 \times 10^{8} m.$$

Applying the DPT Hill Radius equation,

$$r_H = (3.844 \times 10^{8}) \frac{1}{3^{1/3}} (0.232).$$

Substituting

$$3^{1/3} = 1.442,$$

gives

$$r_H = (3.844 \times 10^{8}) \frac{0.232}{1.442}.$$

Therefore,

$$r_H = 6.18 \times 10^{7} m.$$

Converting to kilometers,

$$\boxed{r_H = 61800 km}$$

3.1 Interpretation

The commonly cited lunar Hill Radius is approximately

$$62000km.$$

The DPT result is

$$61800km.$$

The relative error is less than one percent.

This agreement suggests that the DPT gravity formulation captures the same mass-ratio dependence that appears in the classical Hill Radius equation.

1 Planetary Gravitational Boundaries

The previous calculations for the Earth and Moon demonstrate that the DPT gravity formulation naturally reproduces the classical Hill Radius relation.

We now extend the analysis to all major planets of the Solar System.

1.1 General DPT Hill Radius Formula

The classical Hill Radius is

$$r_H = a\left(\frac{m}{3M}\right)^{1/3}.$$

Since

$$\frac{G_2}{G_1} = \left(\frac{M_2}{M_1}\right)^{1/3},$$

the DPT Hill Radius becomes

$$\boxed{r_H = a\frac{(1-e)}{3^{1/3}}\frac{G_2}{G_1}}$$

where

$$a = \text{orbital distance},$$

$$e = \text{orbital eccentricity},$$

$$G_1 = \text{gravity of the larger body},$$

$$G_2 = \text{gravity of the smaller body}.$$

The factor

$$(1-e)$$

accounts for the perihelion distance, where tidal effects are strongest and orbital stability is weakest.

2 Example: Venus

Mass of Venus

$$M_V = 4.867 \times 10^{24} kg.$$

The corresponding energy is

$$E_V = M_V c^2.$$

Substituting,

$$E_V = (4.867 \times 10^{24})(3 \times 10^8)^2 = 4.3803 \times 10^{41} J.$$

The DPT gravity becomes

$$G_V = X_3 E_V^{1/3}$$

with

$$X_3 = 0.62035.$$

Therefore,

$$G_V = 0.62035(4.3803 \times 10^{41})^{1/3} = 4.71 \times 10^{13} J^{1/3}.$$

The Sun's gravity is

$$G_\odot = 3.49 \times 10^{15} J^{1/3}.$$

Hence,

$$\frac{G_V}{G_\odot} = \frac{4.71 \times 10^{13}}{3.49 \times 10^{15}} = 0.01350.$$

Using

$$a = 1.08209 \times 10^{11} m,$$

$$e = 0.006772,$$

and

$$3^{1/3} = 1.442249,$$

the DPT Hill Radius is

$$r_H = (1.08209 \times 10^{11}) \left(\frac{0.993228}{1.442249} \right) (0.01350).$$

Therefore,

$$r_H = 1.006 \times 10^9 m.$$

Converting to kilometers,

$$\boxed{r_H = 1.006 \times 10^6 km}$$

The documented Hill Radius is

$$1.0042 \times 10^6 km,$$

giving a relative error of only

$$0.18\%.$$

3 Comparison with the Solar System

Applying the same procedure to every planet gives

Planet	DPT (million km)	Documented (million km)	Relative Error
Mercury	0.1768	0.1753	0.86%
Venus	1.0060	1.0042	0.18%
Earth	1.4711	1.4714	0.02%
Mars	0.9798	0.9827	0.30%
Jupiter	50.5058	50.5736	0.13%
Saturn	61.4675	61.6340	0.27%
Uranus	66.9002	66.7831	0.18%
Neptune	114.7328	115.0307	0.26%

Table 1: Comparison between DPT predictions and documented Hill Radius values.

3.1 Interpretation

The DPT Hill Radius equation reproduces the documented gravitational boundaries of all major planets with excellent agreement.

The largest relative deviation among the eight planets is less than

$$1\%.$$

This agreement indicates that the DPT gravity formulation preserves the same cube-root mass scaling found in the classical Hill Radius equation.

The eccentricity correction

$$(1 - e)$$

further improves the prediction by accounting for the reduction of orbital stability near perihelion, where the gravitational influence of the Sun is strongest.

Consequently, the DPT gravity formulation provides an alternative expression for estimating planetary gravitational domains while remaining consistent with documented astronomical observations.

1 Quantum Gravity in One Dimension

Since quantum particles are represented in the First Dimension within DPT, the corresponding gravity equation is the one-dimensional gravity law.

Recall the general DPT gravity equation

$$G = X_n E^{1/n}.$$

For the First Dimension,

$$n = 1,$$

therefore

$$G_1 = X_1 E.$$

Using

$$X_1 = \frac{1}{2},$$

the gravity equation becomes

$$\boxed{G = \frac{1}{2}E}$$

The total energy is

$$E = E_\Delta + \tilde{E},$$

where

$$E_\Delta = mc^2,$$

is the mass-energy contribution, and

$$\tilde{E} = hf$$

is the massless (photon) contribution.

1.1 Example: Proton

Mass of the proton

$$m_p = 1.6726 \times 10^{-27} kg.$$

Speed of light

$$c = 2.99792458 \times 10^{8} m/s.$$

Assuming the proton is at rest,

$$f = 0,$$

thus

$$E = mc^2.$$

Substituting,

$$E = (1.6726 \times 10^{-27})(2.99792458 \times 10^{8})^2.$$

Therefore

$$\boxed{E = 1.5033 \times 10^{-10} J}$$

Applying the DPT gravity equation,

$$G = \frac{1}{2}E.$$

Hence

$$G = \frac{1}{2}(1.5033 \times 10^{-10}) = 7.5165 \times 10^{-11} J.$$

Using the DPT equivalence

$$J \equiv m,$$

the corresponding gravity radius becomes

$$\boxed{G = 7.52 \times 10^{-11} m}$$

1.2 Interpretation

The DPT gravity radius calculated for the proton is

$$r_G = 7.52 \times 10^{-11}\ m.$$

For comparison, the Bohr radius of the hydrogen atom is

$$a_0 = 5.29 \times 10^{-11}\ m.$$

The two values are of the same order of magnitude,

$$r_G \sim a_0.$$

This numerical agreement suggests a possible relationship between the DPT gravity radius and the characteristic spatial scale of the hydrogen atom.

Within the DPT framework, this result may indicate that the gravity radius of the proton determines, or is closely related to, the region in which the electron probability cloud forms.

At present, this interpretation should be regarded as a hypothesis rather than a demonstrated physical law.

The present calculation establishes only that the predicted DPT gravity radius and the experimentally measured Bohr radius are numerically comparable.

Further theoretical development together with experimental verification will be necessary to determine whether this relationship is fundamental or simply a numerical coincidence.

If confirmed, the DPT gravity formulation could provide an alternative geometric interpretation for the characteristic size of atomic systems.

1 Atomic Gravitational Boundary

We now investigate whether the DPT Hill Radius formulation can also be applied to atomic systems.

The objective is to determine the gravitational boundary of the electron with respect to the proton, in the same way that the Hill Radius determines the gravitational boundary between two astronomical bodies.

The DPT Hill Radius equation is

$$r_H = a\frac{(1-e)}{3^{1/3}}\frac{G_2}{G_1},$$

where

$$G_1 = \text{gravity of the larger body},$$

$$G_2 = \text{gravity of the smaller body}.$$

Since

$$G = X_n E^{1/n},$$

and for particles

$$n = 3,$$

then

$$G = X_3 E^{1/3}.$$

Therefore,

$$\boxed{\frac{G_2}{G_1} = \left(\frac{E_2}{E_1}\right)^{1/3}}$$

Since

$$E = mc^2,$$

the speed of light cancels,

$$\boxed{\frac{G_2}{G_1} = \left(\frac{m_e}{m_p}\right)^{1/3}}$$

Thus the atomic DPT Hill Radius becomes

$$\boxed{r_H = a\frac{(1-e)}{3^{1/3}}\left(\frac{m_e}{m_p}\right)^{1/3}}$$

where

$$m_p = \text{proton mass},$$

$$m_e = \text{electron mass}.$$

The characteristic separation is taken as the Bohr radius,

$$a = a_0 = 5.2918 \times 10^{-11} m.$$

For hydrogen,

$$e = 0.$$

The mass ratio is

$$\left(\frac{m_e}{m_p}\right)^{1/3} = 0.0817.$$

Substituting,

$$r_H = \frac{5.2918 \times 10^{-11}}{3^{1/3}}(0.0817).$$

Using

$$3^{1/3} = 1.442249,$$

gives

$$\boxed{r_H = 3.00 \times 10^{-12} m}$$

which agrees with your handwritten value

$$3.01 \times 10^{-12} m.$$

1.1 Interpretation

The DPT Hill Radius calculated between the proton and the electron is

$$r_H = 3.0 \times 10^{-12} m.$$

This distance is approximately

$$3pm,$$

which is about

$$5.7\%$$

of the Bohr radius.

Within the DPT framework, this radius may represent the innermost gravitational boundary associated with the proton, rather than the complete extent of the electron probability distribution.

Unlike the previous proton gravity calculation, which produced a characteristic distance comparable to the Bohr radius, the Hill Radius describes the region in which the gravitational influence of the proton dominates relative to the electron.

This result suggests that DPT may provide two distinct characteristic atomic length scales:

- the proton gravity radius,

  $$7.52 \times 10^{-11} m,$$

  which is comparable to the Bohr radius,

- the proton–electron DPT Hill Radius,

  $$3.0 \times 10^{-12} m,$$

  which represents the predicted gravitational boundary between the two particles.

Whether these two characteristic distances correspond to observable quantum structures remains an open question that requires additional theoretical development and experimental verification.

1 Gravity Force in Three Dimensions

The DPT gravity introduced in previous chapters represents the gravity radius generated by the energy of a body.

Although the gravity radius describes the spatial extent of the gravitational field, it does not directly represent the force experienced by another body.

To determine this force, DPT introduces the **Force of Gravity Radius (FGR)**.

The centripetal force acting on an orbiting body is

$$F = m_b \frac{v^2}{r},$$

where

$$m_b = \text{mass of the orbiting body},$$

$$v = \text{orbital velocity},$$

and

$$r = \text{orbital radius}.$$

Since

$$v = \omega r,$$

we obtain

$$F = m_b \omega^2 r.$$

Within DPT,

$$r = g_r,$$

therefore

$$F_{DPT} = m_b \omega^2 g_r.$$

Using

$$\omega = \frac{2\pi}{T},$$

the force becomes

$$F_{DPT} = m_b \left(\frac{2\pi}{T}\right)^2 g_r.$$

Finally,

$$\boxed{F_{DPT} = g_r m_b \frac{4\pi^2}{T^2}}$$

where

g_r = gravity radius,

m_b = orbiting body mass,

and

T = orbital period.

2 Example: Earth Orbiting the Sun

Earth mass

$$m_b = 5.972 \times 10^{24}\ kg.$$

Orbital period

$$T = 3.15576 \times 10^7\ s.$$

From the previous chapter,

$$g_r = 3.49 \times 10^{15} J^{1/3}.$$

According to the DPT unit postulate,

$$J^{1/3} \equiv m,$$

therefore

$$g_r = 3.49 \times 10^{15} m.$$

Applying the DPT force equation,

$$F_{DPT} = g_r m_b \frac{4\pi^2}{T^2},$$

gives

$$F_{DPT} = (3.49 \times 10^{15})(5.972 \times 10^{24}) \frac{4\pi^2}{(3.15576 \times 10^7)^2}.$$

Hence,

$$\boxed{F_{DPT} = 8.28 \times 10^{26} N.}$$

3 Discussion

For comparison, Newtonian gravity predicts

$$F = \frac{GM_\odot M_E}{r^2} \approx 3.54 \times 10^{22} N.$$

The DPT result is significantly larger than the Newtonian value.

Within the DPT framework this difference should not yet be interpreted as a contradiction because the two equations describe different physical quantities.

The Newtonian equation represents the instantaneous force acting between two bodies separated by a distance r.

The DPT equation instead represents the force associated with the entire gravity radius generated by the central body.

Consequently, establishing the precise correspondence between F_{DPT} and Newtonian gravity requires additional theoretical development.

At present the Force of Gravity Radius should therefore be regarded as a theoretical prediction of DPT that remains to be tested experimentally.

The **fourth dimension** in DPT represents the **dark matter / cognitive realm**, existing beyond direct physical perception but influencing the 3D world.

- It is a **non-visible, higher-dimensional system**.
- Associated with **dark matter as its primary energy form**.
- Accessed through **consciousness (thought, dreams, ideas)**.
- **Entities**: cognitive phenomena / higher-dimensional beings
- **Energy form**: dark matter (non-observable but influential)
- **Function**: origin of thoughts, ideas, and mental processes
- **Brain = interface to 4D**
- **Space** → relative to thought (mentally shaped)
- **Time** → nonlinear, elastic, perception-dependent
- Possible link: **dark matter distribution ↔ neural networks**

The fourth dimension is a **cognitive-energy domain** where **thought and dark matter interact**, influencing lower dimensions while operating beyond direct observation.

4th Dimension → Gravitational Force

- **Role**: curvature of space-time
- **Carrier**: graviton (via dark matter field)
- **Property**: large-scale structure formation

One of the fundamental postulates of Dimensional Physics Theory (DPT) is that gravity is not an independent interaction acting within the third dimension. Instead, gravity is interpreted as a manifestation of the Fourth Dimension.

Within this framework, ordinary matter exists primarily in the Third Dimension, while its associated gravitational field is represented by its projection into the Fourth Dimension.

Consequently, regions containing larger concentrations of ordinary matter are expected to generate larger fourth-dimensional gravitational structures.

This interpretation naturally associates the Fourth Dimension with the phenomena commonly attributed to dark matter.

1 Gravity in the Fourth Dimension

The four-dimensional hypersphere has volume

$$V_4 = \frac{\pi^2}{2} r^4.$$

Following the DPT correspondence between geometry and energy,

$$E = V_4,$$

giving

$$E = \frac{\pi^2}{2} g^4,$$

where

$$g$$

represents the gravity radius in the Fourth Dimension.
Solving for the gravity radius,

$$g = \left(\frac{2}{\pi^2}\right)^{1/4} E^{1/4}.$$

Therefore,

$$\boxed{G_4 = X_4 E^{1/4}}$$

where

$$\boxed{X_4 = \left(\frac{2}{\pi^2}\right)^{1/4}}$$

is the fourth-dimensional gravitational constant of DPT.

2 Interpretation

Within DPT, the fourth-dimensional gravity equation suggests that every physical system possessing energy generates an associated fourth-dimensional gravitational component.

Unlike the standard cosmological interpretation, DPT proposes that this fourth-dimensional component corresponds to the geometric origin of what is commonly interpreted as dark matter.

Consequently, systems containing larger amounts of ordinary matter are predicted to generate larger fourth-dimensional gravitational fields.

At present this statement should be regarded as a theoretical prediction of DPT requiring observational verification.

3 Example: Dark Matter inside the Solar System

To illustrate the fourth-dimensional gravity equation we estimate the amount of dark matter expected inside the Solar System.

Current astrophysical observations estimate the local dark matter density near the Solar System as approximately

$$\rho_{DM} = 5.3 \times 10^{-22} kg\, m^{-3}.$$

Assume a spherical region of radius

$$R = 100 AU = 1.496 \times 10^{13} m.$$

Its volume is

$$V = \frac{4}{3}\pi R^3 = 1.40 \times 10^{40} m^3.$$

The enclosed dark matter mass is therefore

$$M_{DM} = \rho_{DM} V = 7.42 \times 10^{18} kg.$$

4 Dark Matter Energy

Assuming the dark matter is non-relativistic,

$$E_{DM} = M_{DM}c^2.$$

Substituting,

$$E_{DM} = (7.42 \times 10^{18})(2.99792458 \times 10^8)^2.$$

Hence,

$$\boxed{E_{DM} = 6.67 \times 10^{35} J}$$

5 Fourth-Dimensional Gravity

Applying the DPT gravity equation,

$$G_4 = X_4 E^{1/4},$$

with

$$X_4 = \left(\frac{2}{\pi^2}\right)^{1/4} = 0.67094,$$

gives

$$G_4 = 0.67094 \left(6.67 \times 10^{35}\right)^{1/4}.$$

Evaluating,

$$\boxed{G_4 = 6.05 \times 10^8 J^{1/4}.}$$

6 Comparison of Energy Scales

For comparison, the ordinary mass-energy of the Solar System is

$$E_{SS} = 1.79 \times 10^{47} J.$$

The ratio between the estimated dark matter energy and the ordinary mass-energy is

$$\frac{E_{DM}}{E_{SS}} = 3.72 \times 10^{-12}.$$

Expressed as a percentage,

$$\boxed{3.72 \times 10^{-10}\%.}$$

7 Discussion

The calculation indicates that the estimated amount of local dark matter enclosed within a sphere of radius 100 AU contributes only a very small fraction of the total energy of the Solar System.

Within the DPT framework this energy generates a fourth-dimensional gravity described by

$$G_4 = X_4 E^{1/4}.$$

Because third-dimensional gravity

$$G_3 = X_3 E^{1/3}$$

and fourth-dimensional gravity

$$G_4 = X_4 E^{1/4}$$

are defined through different dimensional scaling laws, their numerical values should not be compared directly.

Instead, comparisons between different dimensions should be performed using their underlying energies or through dimension-independent invariants that may be developed in future chapters.

The present calculation therefore demonstrates the application of the fourth-dimensional gravity equation while remaining fully consistent with the mathematical structure of DPT.

7. THE FIFTH DIMENSION

The **fifth dimension** in DPT represents the **dark energy / vibrational realm**, the highest theoretical dimension where **frequency and emotion define existence**.

- It is a **frequency-based system**.
- Associated with **dark energy as its primary energy form**.
- Accessed through **emotions and internal vibrations**.
- **Entities**: emotional/vibrational states
- **Energy form**: dark energy (repulsive, expansive)
- **Behavior**: governed by **frequency and wave dynamics**
- **Everything = vibration/frequency**
- **Space** → continuous but differentiated by frequency
- **Time** → transitions between emotional/vibrational states (nonlinear)
- **Force behavior → repulsive (opposite of gravity)** → expansion

The fifth dimension is a **vibrational energy domain** where **dark energy drives expansion, and existence is defined by frequency rather than form**.

5th Dimension → Vibrational Force

- **Role**: governs all forces and reality
- **Carrier**: (not defined yet)
- **Property**: frequency control, origin of energy transitions

All forces are **dimension-dependent**, and the **5th dimension (vibrational force)** acts as the **ultimate controlling field of existence**.

1 Gravity in the Fifth Dimension

Within DPT, the Fifth Dimension is associated with the Vibrational Force, which is proposed as the fifth fundamental interaction of nature.

The five-dimensional hypersphere has hypervolume

$$E = \frac{8}{15}\pi^2 r^5,$$

where, according to the DPT correspondence,

$$r = g,$$

with g representing the fifth-dimensional gravity radius.

Therefore,

$$E = \frac{8}{15}\pi^2 g^5.$$

Solving for the gravity radius,

$$g = \sqrt[5]{\frac{15}{8\pi^2}}\sqrt[5]{E}.$$

The fifth-dimensional gravitational constant is therefore

$$\boxed{X_5 = \sqrt[5]{\frac{15}{8\pi^2}}}$$

and the general DPT gravity equation becomes

$$\boxed{G_5 = X_5 E^{1/5}.}$$

2 The Vibrational Force

DPT proposes that the Vibrational Force is the fundamental interaction associated with the Fifth Dimension.

Unlike the four currently established fundamental interactions, the Vibrational Force is hypothesized to describe the vibrational structure of space-time itself.

Within the DPT framework, this force is proposed to be responsible for

- vibrational motion of space-time,
- quantum fluctuations,
- dark energy,
- and the dynamical behaviour of strings proposed in string theory.

These interpretations should presently be regarded as theoretical predictions of DPT and require further mathematical development together with experimental verification.

3 Frequency of the Vibrational Force

The frequency is defined by

$$F = \frac{1}{T},$$

where

$$T = t.$$

Since DPT establishes the space-time relation

$$t = S - 1,$$

the frequency becomes

$$F = \frac{1}{S-1}.$$

Within DPT,

$$S \equiv A \equiv E,$$

meaning that space, geometric measure, and the intrinsic energy of space are equivalent descriptions of the same fundamental quantity.

Using the five-dimensional energy relation,

$$S = E = \frac{8}{15}\pi^2 g^5,$$

the vibrational frequency becomes

$$F = \frac{1}{\frac{8}{15}\pi^2 g^5 - 1}.$$

Multiplying numerator and denominator by 15,

$$\boxed{f_v = \frac{15}{8\pi^2 g^5 - 15}}$$

which is proposed as the DPT Vibrational Force at any point in space-time.

4 Propagation Between Two Bodies

Using the wave relation

$$v = \lambda f,$$

where

$$\lambda = \text{distance between two bodies},$$

the propagation velocity of the Vibrational Force becomes

$$\boxed{v_v = \frac{15\lambda}{8\pi^2 g^5 - 15}}$$

where

$$g = \text{gravity radius of the system.}$$

5 Interpretation

Within DPT, the Vibrational Force is proposed to exist throughout all regions of space-time.

The theory predicts an inverse relationship between gravity and vibration:

- larger gravity radii correspond to weaker vibrational activity,
- weaker gravity corresponds to stronger vibrational activity.

Consequently, DPT predicts that regions containing highly concentrated matter exhibit reduced vibrational activity, whereas regions dominated by dark energy exhibit stronger vibrational behaviour.

These predictions remain theoretical and require further mathematical development together with experimental testing.

6 Energy in the Fifth Dimension

The total energy of a system is

$$E = mc^2 + hf.$$

Within the DPT interpretation of the Fifth Dimension, massive matter is not the dominant contribution.

Accordingly,

$$m = 0,$$

giving

$$\boxed{E_5 = hf.}$$

Thus the Fifth Dimension is represented entirely by massless energy.

This postulate provides the basis for describing dark energy and the Vibrational Force within DPT.

At present this interpretation should be regarded as a theoretical prediction requiring further mathematical and experimental investigation.

1 Potential Technological Applications of DPT

The Dimensional Physics Theory (DPT) introduces a new framework for describing space, time, energy, gravity, dark matter, dark energy, and the proposed Vibrational Force.

If the theoretical predictions presented throughout this work are confirmed experimentally, DPT may provide the foundation for new technologies that are not currently achievable using conventional physics.

The following examples should therefore be regarded as long-term theoretical possibilities rather than established technologies.

2 Potential Applications

1. **Anti-Gravity**

   Manipulation of gravity through the control of gravity radius, allowing partial or complete reduction of gravitational effects.

2. **Gemespasys (Space-Time Manipulation)**

   Engineering the geometry of space-time using the DPT Gemespasys equations, potentially allowing controlled space-time manipulation.

3. **Dark Matter Manipulation**

   Control or concentration of fourth-dimensional gravitational fields associated with dark matter according to the DPT framework.

4. **Dark Energy Manipulation**

   Manipulation of fifth-dimensional vibrational energy and the proposed Vibrational Force for future energy or propulsion applications.

5. **Prime Number Encryption**

   Development of cryptographic systems based on the DPT interpretation of prime numbers and their geometric representation across dimensions.

6. **DPT Bioengineering**

   Long-term applications involving biological aging, regenerative medicine, and lifespan extension through controlled manipulation of space-time and energy.

3 Remarks

The technologies listed in this chapter are speculative predictions derived from the theoretical framework of DPT.

Their realization depends entirely upon future mathematical development, experimental verification, and engineering advances.

Accordingly, these ideas should be viewed as possible research directions rather than demonstrated capabilities.

Future editions of this work may expand this chapter as new theoretical results and experimental evidence become available.

8. DIMENSIONAL EVOLUTION

Dimensional Evolution in DPT extends classical evolution by describing how **beings evolve across dimensions**, not just within one

- Evolution is **hierarchical and inevitable**
- Each dimension has **stages (species/phases)**
- When a system reaches its peak → it **transitions to the next dimension**

Evolution Path (Core Chain)

- **1D (Quantum)**:
  massless particles → mass particles → atoms
- **2D (Molecular)**:
  simple molecules → complex molecules → DNA
- **3D (Physical)**:
  cells → organisms → humans → human–machine integration
- **4D (Cognitive)**:
  thoughts → dreams → higher consciousness (dark matter beings)
- **5D (Vibrational)**:
  emotions → pure frequency states (dark energy beings)

Evolution is a **dimensional ascent**, where increasing complexity leads to **transition into higher-dimensional forms of existence**.
Each higher dimension represents a **more abstract and fundamental form of existence**:
matter → mind → emotion → pure energy.

9. CONCLUSION

Dimensional Physics Theory (DPT) has been developed throughout this work as a unified mathematical framework intended to describe physical reality through the language of dimensions. Beginning from the Space–Time–Energy (STE) model, this volume has progressively introduced mathematical structures that relate geometry, energy, gravity, and dimensional behavior under a common formalism.

Unlike conventional approaches that begin with separate physical laws for different phenomena, DPT proposes that these laws may emerge from a deeper dimensional organization. Within this framework, gravity is interpreted through gravity radius rather than solely as a force or curvature, dimensions are treated as mathematical phases of existence, and energy acts as the fundamental quantity governing dimensional behavior.

One of the principal mathematical results developed in this work is the general gravity equation

$$G_r(n) = X_n E^{1/n}$$

which provides a common expression for gravity across arbitrary dimensions. From this equation follow several additional results, including dimensional compression laws, generalized gravitational boundaries, reformulations of Hill radius calculations, and relationships between energy and dimensional structure.

The theory has also proposed several extensions beyond established physics, including higher-dimensional gravity, a possible relationship between gravity and dark matter, a proposed fifth-dimensional vibrational interaction, and new interpretations of quantum and cosmological phenomena. These proposals should presently be regarded as theoretical hypotheses rather than experimentally established facts. Their scientific value will ultimately depend on whether they produce precise, reproducible, and experimentally testable predictions.

Throughout this volume, numerous calculations have been compared with known physical quantities, demonstrating that the mathematical framework of DPT is internally consistent within its own assumptions and capable of reproducing several classical results through alternative derivations. These examples do not by themselves validate the theory, but they provide motivation for further investigation and suggest that the framework deserves deeper mathematical analysis.

As with every scientific theory, the long-term success of DPT will not depend upon its originality or philosophical appeal, but upon its predictive power. If future theoretical work and experimental evidence confirm even part of its predictions, DPT may contribute to a broader understanding of gravity, dimensions, and the fundamental structure of reality. If not, it will nevertheless have served as a systematic exploration of an alternative mathematical approach to these questions.

This volume should therefore be viewed not as the final form of Dimensional Physics Theory, but as its mathematical foundation. Future research will determine whether the framework can be refined, extended, or experimentally confirmed.

Science advances through bold ideas subjected to rigorous testing. Dimensional Physics Theory is offered in that spirit.

General Behavior of DPT Gravity Across Dimensions
The DPT gravity equation derived throughout this work is

$$\boxed{G_r(n) = X_n E^{1/n}}$$

where

$$n$$

represents the dimensional order.
To compare the behavior across dimensions, let the energy remain fixed. For illustration,

$$E = 10^{60} J.$$

1 Gravity Radius in Different Dimensions

Using the DPT constants,

$$G_1 = \frac{1}{2} E,$$

$$G_2 = \frac{1}{\sqrt{\pi}} E^{1/2},$$

$$G_3 = \sqrt[3]{\frac{3}{4\pi}} E^{1/3},$$

$$G_4 = \sqrt[4]{\frac{2}{\pi^2}} E^{1/4},$$

$$G_5 = \sqrt[5]{\frac{15}{8\pi^2}} E^{1/5},$$

the corresponding values become

$$G_1 = 5.0 \times 10^{59},$$

$$G_2 = 5.64 \times 10^{29},$$

$$G_3 = 6.20 \times 10^{19},$$

$$G_4 = 2.12 \times 10^{14},$$

$$G_5 = 7.28 \times 10^{11}.$$

These results indicate that, for constant energy,

$$\boxed{G_1 > G_2 > G_3 > G_4 > G_5.}$$

Hence, within DPT, the gravity radius is a monotonic decreasing function of the dimensional order.

2 Transition Ratios

The ratios between successive dimensions are

$$\frac{G_1}{G_2} = 8.9 \times 10^{29},$$

$$\frac{G_2}{G_3} = 9.1 \times 10^{9},$$

$$\frac{G_3}{G_4} = 2.9 \times 10^{5},$$

$$\frac{G_4}{G_5} = 2.9 \times 10^{2}.$$

The decrease becomes progressively smaller as the dimension increases.

3 Asymptotic Behavior

Since

$$G_r(n) = X_n E^{1/n},$$

and

$$\lim_{n\to\infty} E^{1/n} = 1,$$

the dominant contribution at very large dimensions becomes

$$G_r(n) \to X_n.$$

Therefore higher dimensions progressively compress the influence of energy.

This behavior suggests that energy amplification dominates the lowest dimensions while higher dimensions damp the influence of energy.

4 Successive Dimension Ratio

Define the ratio

$$R(n) = \frac{G_r(n)}{G_r(n+1)}.$$

Using

$$G_r(n) = X_n E^{1/n},$$

gives

$$R(n) = \frac{X_n}{X_{n+1}} E^{\frac{1}{n} - \frac{1}{n+1}}.$$

Since

$$\frac{1}{n} - \frac{1}{n+1} = \frac{1}{n(n+1)},$$

the ratio becomes

$$\boxed{R(n) = \frac{X_n}{X_{n+1}} E^{\frac{1}{n(n+1)}}.}$$

This equation describes the dimensional compression factor between consecutive dimensions.

As

$$n \to \infty,$$

the exponent approaches zero,

$$\frac{1}{n(n+1)} \to 0,$$

so

$$R(n) \to \frac{X_n}{X_{n+1}}.$$

Thus the collapse rate gradually stabilizes at higher dimensions.

5 Conceptual Interpretation

Within DPT, the mathematical behavior suggests that lower dimensions amplify the observable effects of energy while higher dimensions progressively compress them.

This dimensional compression law is one of the central mathematical predictions of DPT and may provide insight into the hierarchical organization of interactions across dimensions.

6 Conceptual Correspondence of Dimensions

The following table summarizes the conceptual interpretation proposed by DPT.

Dimension	Color	Force	Carrier	Concept
1	Red	Strong Nuclear	Gluons	Particles
2	Yellow	Weak Nuclear	W/Z Bosons	Molecules
3	Green	Electromagnetic	Photons	Cells
4	Blue	Gravity	Dark Matter	Mind
5	Purple	Vibrational	Strings	Feelings

This table represents a conceptual interpretation proposed by DPT and should not presently be interpreted as experimentally established physics.

*Final Remarks

Dimensional Physics Theory has introduced a mathematical framework that unifies geometry, gravity, energy, space, and time through a common dimensional formulation.

The equations developed throughout this work provide numerous theoretical predictions that remain open to future mathematical investigation and experimental verification.