# The First Mistake in Physics

Why Only the First Two Coordinates Are Dimensions

Correcting Mainstream Physics

James Johan Sebastian Allen
PatternFieldTheory.com

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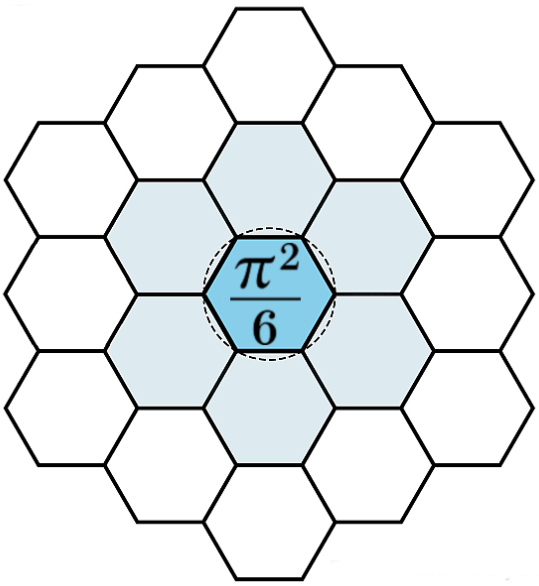
*"The ontological hierarchy must always be treated first."*
James Johan Sebastian Allen, *Pattern Field Theory*




**Abstract**

Modern physics and popular science narratives present a ladder of dimensions: 0D point, 1D line, 2D plane, 3D space, 4D time, and higher dimensions in string and M-theory. These are not merely used as modeling devices; they are explicitly presented as dimensions of reality. This paper shows that this is a category error. A dimension is not something added to a model; a dimension is something that must exist before any model is possible. Pattern Field Theory defines dimensions ontologically: the first coordinate constitutes Dimension 1 (Identity), the second coordinate constitutes Dimension 2 (Relation). No further coordinate creates a new dimension. All geometry, including lines, planes, volumes, space, and so-called higher dimensions, is emergent structure internal to Dimension 2. What is called "3D" is shown to be the construction 2D + 1D. Time is not a dimension but an emergent ordering of relational state traversal.

## Introduction

Popular physics does not merely use higher-dimensional models. It explicitly states that these are *dimensions of reality*. This is the foundational mistake.

Coordinates, parameter spaces, and degrees of freedom are tools of description. A dimension, in the foundational sense, is a primitive of existence: something that must be present before any description, coordinate system, or equation is even possible.

This paper makes a precise claim:

> A dimension is created when a coordinate appears. The first coordinate creates the first dimension. The second coordinate creates the second dimension. No further coordinate creates a new dimension.

The mainstream dimensional ladder does not start at the beginning. It starts *after* identity and relation already exist.

Geometry is not wrong. Geometry is late.

## Ontological Priority

> **Axiom (Ontological Priority).** The ontological hierarchy must be treated before any representational or dynamical structure.

> **Axiom (Penrose Criterion — Internal Consistency).** No structure, object, operation, or concept may be used in a construction unless its existence has already been justified by prior steps of the theory. Nothing may be assumed from the representational level to build the ontology.

Mainstream physics implicitly follows the construction order:

> Dynamics → Objects → Structure → Coordinates

Pattern Field Theory follows the construction order:

> Ontology → Relation → Structure → Dynamics

This is a difference in dependency order, not interpretation.

## Structural Inconsistency in Mainstream Physics

Mainstream physics declares an ontology in which objects exist in spacetime and evolve under laws. In every nontrivial regime, this ontology fails.

Whenever background-independence, renormalization, or constraint closure becomes non-negotiable, the object-in-spacetime picture collapses. The mathematics is then forced into a different dependency order, not by philosophy, but by consistency.

- **General relativity.** Geometry is not presupposed; it is determined by relations among energy-momentum.

$$\text{constraints and relations} \rightarrow \text{geometry} \rightarrow \text{motion}$$

  This violates "coordinates first" and makes geometry emergent from relations.

- **Gauge theories.** Symmetry constraints are primary; "objects" are representations of constraints.

$$\text{symmetry (ontology)} \rightarrow \text{relations} \rightarrow \text{structure} \rightarrow \text{dynamics}$$

- **Renormalization group (QFT).** You do not start from particle ontology. You start from scale-consistency of interactions; effective objects appear after constraints.

$$\text{consistency constraints} \rightarrow \text{relations} \rightarrow \text{emergent structure} \rightarrow \text{effective dynamics}$$

- **Canonical quantum gravity (Wheeler-DeWitt).** Time disappears at the fundamental level and reappears only as emergent ordering from constraint structure.

$$\text{ontology/constraints} \rightarrow \text{structure} \rightarrow \text{dynamics}$$

- **Relational and information-theoretic QM.** States are relational. Absolute object ontology is replaced by relation-first descriptions.

$$\text{relations} \rightarrow \text{structure} \rightarrow \text{dynamics}$$

Every time physics confronts a regime where mathematical consistency is non-negotiable, its declared ontology fails.

The formalism is forced into the dependency order that Pattern Field Theory states explicitly:

$$\text{ontology} \rightarrow \text{relation} \rightarrow \text{structure} \rightarrow \text{dynamics}$$

Mainstream physics does not converge to this order. It collapses into it locally while continuing to deny it globally.

This is not a disagreement of interpretation. It is a broken dependency stack.

## Dependency Order

### Hardening Allenix Against Typical Criticisms

Terminology challenge ("dimension" must be geometric): Define "dimension" explicitly as an ontological prerequisite, not a representational axis. Then state: geometric dimensions are representations inside Dimension 2. This prevents a semantic strawman.

"Identity is not a dimension" rebuttal: Add a formal definition: Dimension = minimal admissible coordinate enabling distinction. The first coordinate is identity by necessity. Follow with a lemma that any operational use of a line requires binary comparison, hence presupposes identity and relation.

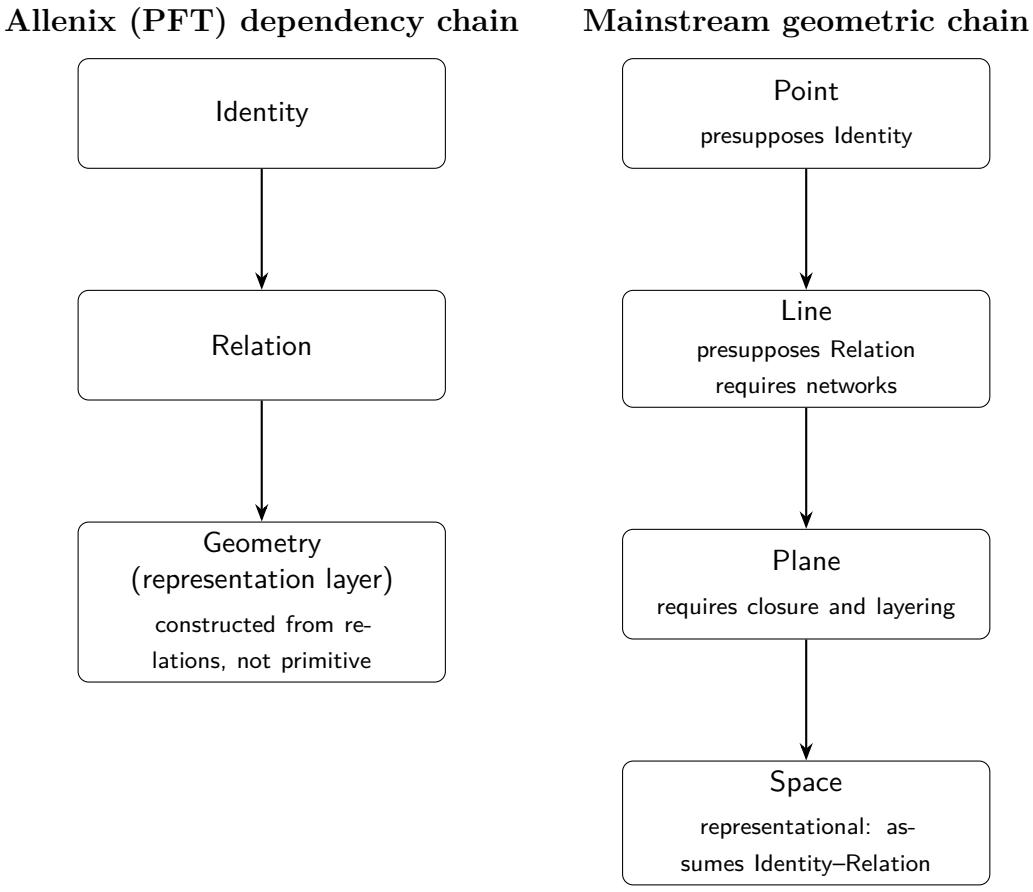



Figure 1: Dependency chain comparison: Allenix vs. mainstream. The mainstream ladder begins after identity and relation already exist.

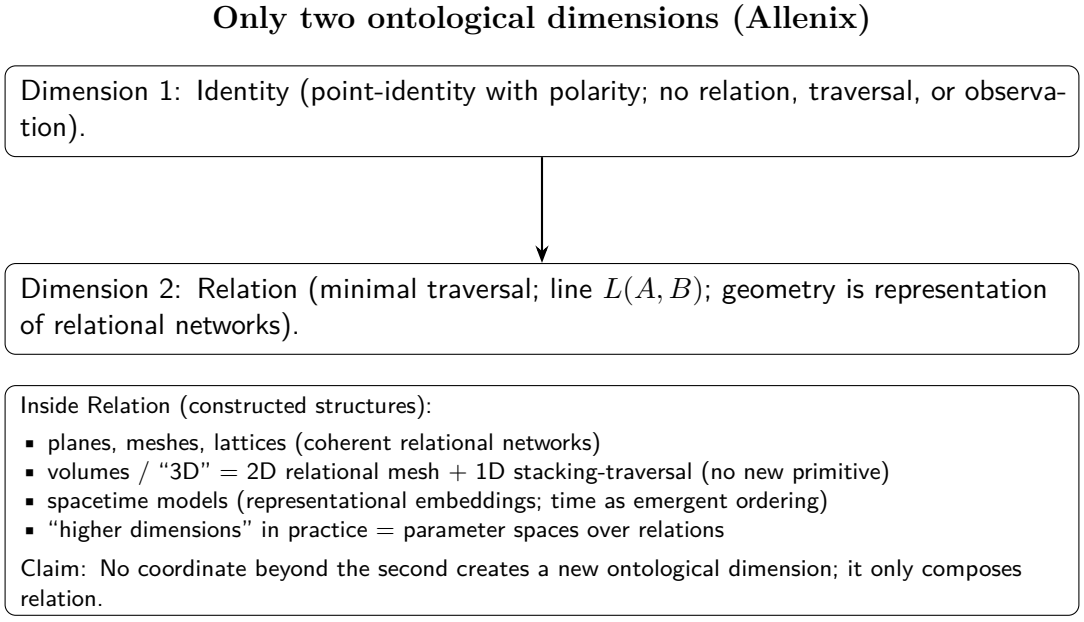



Figure 2: Two true dimensions in Allenix: Identity and Relation. Everything else is structure inside Relation.

Empirical relevance demand: Point directly to GR background independence, gauge redundancy,

RG emergence, and the problem of time. Don't soften: mainstream practice already uses your order to avoid contradictions. You are making it explicit and global.

Scope containment: Keep the correction narrow and mechanical: you are repairing the dependency stack, not discarding geometric methods. Lines, planes, volumes remain effective but are reclassified as representations over relations.

## Operational Physics vs Ontological Priority: Feynman as a Witness

This paper separates two layers that are routinely conflated:

- **Operational layer:** how already-stable physical processes behave once coherence exists.
- **Ontological layer:** what must exist first such that any stable process can exist at all.

Feynman's lectures are exemplary operational physics. Pattern Field Theory is an ontological dependency correction.

### Primitive Terms (Used in This Section)

The following primitives are used in the stability-first formulation:

- **Metacontinuum:** pre-dimensional zero-occupancy substrate (no identity, no relation).
- **Pattern:** a relational configuration class.
- **Closure:** a self-consistent recurrence of a configuration class.
- **Admissibility:** satisfaction of coherence constraints required for persistent closure.
- **Permission:** persistence of closure under admissibility constraints.
- **Closure graph:** adjacency structure of admissible continuations between configurations.
- **Closure density:** local measure of recurrent closure frequency within the closure graph.

### What Feynman Establishes (Operational Layer)

Feynman proceeds from measurement and invariance. In Newtonian gravity, orbital motion is continuous free-fall under an inverse-square law. In General Relativity, gravity is re-expressed geometrically: objects follow geodesics determined by the metric, and the "force" picture is replaced by inertial motion on a constrained geometry.

For time, Feynman treats time operationally via clocks: time dilation is a comparative rate shift between physical processes (light clocks, particle lifetimes, GPS correction requirements). The content is mechanical: clocks are physical recurrence processes, and "time" is what is inferred from their recurrence behavior.

Feynman describes stable motion after stability already exists. He does not supply an upstream mechanism selecting which structures can exist in the first place.

## Why Geometry Is Not Primary (Ontological Layer in Pattern Field Theory)

Pattern Field Theory does not assume objects, trajectories, geometry, or dimensions as primitives. Ontology is treated first.

In PFT terms:

- A **mass** corresponds to a region of high closure density (high recurrence saturation).
- A **trajectory** is an admissible continuation path through the closure graph.
- **Curvature** is a statistical bias in admissible continuation induced by closure-density gradients.

Thus, what General Relativity calls "spacetime curvature" maps to an emergent bias in admissible continuation structure rather than a primitive geometric object.

## Stability as the Primitive

**Axiom (Stability Priority).** Identity is not primary. Stability is.

Only configurations that satisfy admissibility conditions instantiate persistent closure. This stability filter is upstream of particles, fields, geometry, and any representational coordinate system.

Feynman describes the behavior of patterns that have already passed the stability filter. Pattern Field Theory specifies the stability filter itself.

## Time as Stabilization Ordering

Time is not a primitive dimension in Pattern Field Theory. Time is the irreversible ordering of stabilization events (closure captures).

- A **clock** is a cyclic closure recurrence.
- **Time dilation (velocity)** corresponds to increased continuation path-length in the closure graph, increasing the number of internal stabilization steps per external reference cycle.
- **Time dilation (gravity)** corresponds to routing through higher closure-density regions, increasing the local recurrence cost per cycle.

Operationally, this reproduces Feynman's clock-rate definition: the measurable effect is a comparative rate shift of physical recurrence processes, expressed here as recurrence-cost variation.

## Clocks Are Reference Processes (Operational Discipline)

A clock does not measure an ontological substance called "time". A clock is a specific physical recurrence process selected as a reference against which other processes are compared. Atomic clocks are stable reference recurrences, not privileged containers.

This operational discipline is consistent with PFT: what is called "time" is bookkeeping over recurrence, and what is called "time dilation" is a change in recurrence cost or recurrence rate relative to a chosen reference process.

**Proposition 1.** *There is no universal physical process that defines time for all systems. There are only reference processes used for comparison.*

### Gravity as Closure-Density Gradient

Gravity is not a force and not primary geometry. It is the global statistical consequence of local admissibility constraints:

> The admissible continuation set is biased by local closure-density gradients, producing the observed inward acceleration of stable trajectories.

Orbits are closed, non-decaying resonance paths that remain admissible under local closure constraints over extended recurrence. This is compatible with geodesic motion, but derived from stability-first admissibility rather than assumed curvature-first geometry.

### Why Quantizing Geometry Is the Wrong Target

Standard approaches to quantizing General Relativity encounter non-renormalizable behavior when the metric is treated as a fundamental field.

In Pattern Field Theory:

- There is no fundamental geometry to quantize.
- "Quantum gravity" corresponds to granularity in closure selection (virtual differentiats that fail admissibility).
- Coupling occurs through shared closure graphs and phase alignment locks (PAL), where a phase alignment lock is the condition under which coupled closures maintain stable relative phase across recurrence structure.

Geometry is therefore a derived statistical property, not the quantization target.

### Synthesis

> Feynman describes the behavior of stable motion in an already-coherent universe. Pattern Field Theory describes the mechanism by which only such stable motion is allowed to exist in the first place.

## Compatibility Notes: Why Newton Still Works

This paper does not discard effective theories. Newtonian gravity remains an exceptionally good effective description in regimes where closure-density gradients are weak and where stable trajectories are well-approximated by smooth geodesic families.

Newton's inverse-square law is interpreted here as an effective compression of closure-density gradient behavior under a smooth-field approximation. The success of Newton is therefore expected: it is a stable approximation to stable motion.

## Compatibility Notes: Why General Relativity Still Works

General Relativity is retained as a correct geometric representation of stable motion under strong closure-density gradients. The PFT claim is not that GR is wrong, but that GR begins after the ontological selection event.

In this sense, GR supplies the best known representational geometry for admissible continuations; PFT supplies the upstream mechanism that makes such a geometry emergent and necessary rather than assumed.

## Pre-Dimensional State (Metacontinuum)

Before any coordinate exists, there is no identity, no distinction, no relation, no structure. This is not a point. A point is already something.

**Definition 1** (Metacontinuum)**.** *The Metacontinuum is the pre-dimensional null state: no identity, no distinction, no relation, no structure.*

## The First Dimension: Identity

**Definition 2** (Dimension 1 — Identity)**.** *The appearance of the first coordinate constitutes the first dimension. This coordinate is an identity: a self-consistent, referenceable unit of distinction.*

A point is not "0D". A point is already the first coordinate and therefore already Dimension 1.

With only one coordinate:

- No relation is possible
- No traversal is possible
- No comparison is possible

The first dimension exists, but is null in expression.

## The Second Dimension: Relation

**Definition 3** (Dimension 2 — Relation)**.** *The appearance of the second coordinate constitutes the second dimension. At this moment, relation becomes possible.*

The minimal structure is:

$$A \; - - - \; B$$

This is what is usually drawn as a line. Ontologically, it is not geometry. It is relation.

**Definition 4** (AOL)**.** *The Allen Orbital Lattice (AOL) is the discrete adjacency substrate on which admissible relational configurations and closure recurrences are defined in Pattern Field Theory.*

**Definition 5** (PAL)**.** *A Phase Alignment Lock (PAL) is the condition under which coupled closures maintain stable relative phase across recurrence, enabling persistent multi-node coherence on the AOL.*

## No Further Dimensions Exist

**Proposition 2.** *No coordinate beyond the second creates a new ontological dimension.*

The only ontological transitions are:

- $0 \to 1$ coordinate: Dimension 1 begins (Identity)
- $1 \to 2$ coordinates: Dimension 2 begins (Relation)

After this, nothing fundamentally new appears. Only more structure.

## Why Lines, Planes, and Volumes Do Not Add Dimensions

A line and a plane are both structures inside Dimension 2. A plane is not a new dimension. It is more relations.

A volume is not a new dimension. It is relations arranged in layered structure.

## Why 3D Is 2D Plus 1D

**Proposition 3.** *What is called "3D" is the construction:*

$$3D = 2D + 1D.$$

A cube is a two-dimensional relational structure stacked along a one-dimensional identity index.

No new primitive appears. Only composition appears.

## Why Spatial Coordinates Already Encode 3D as 2D + 1D

In practice, spatial coordinates are always treated as:

$$(x, y) + z$$

Humans:

- Draw surfaces first
- Then add depth
- Use blueprints, CAD, maps, and meshes in 2D before extrusion

This reflects the true dependency order:

> 3D is not primitive. 3D is constructed.

## Why Dimensionality Must Precede Time

A fundamental question exposes the category error at the heart of mainstream physics:

> Why would time be necessary at the base of reality if nothing structured precedes it?

If the base level of reality is truly null—no geometry, no fields, no particles, no coordinates, no identities, no relations—then time has nothing to act upon and nothing to be measured against. Time requires at minimum:

- Something that can change (a configuration that can be different from itself),
- A way to distinguish "before" from "after" (an ordering relation),
- A mechanism of persistence (so that change can be tracked rather than instantly dissolving).

In a pure null substrate (the Metacontinuum), none of these exist. There is no state, no clock, no ordering, no memory, no arrow. Without prior structure and recurrence, "time" has no operational content.

**Proposition 4.** *Any theory that presupposes time at the pre-structural level commits a category error. Time cannot be a primitive of the theory.*

Pattern Field Theory therefore begins with dimensionality and structure, not with time. Only once structure exists can any notion of sequencing or ordering arise.

> Dimensionality must come first. Time can only appear once there is something to order.

## Why Time Cannot Be a Dimension

Mainstream physics frequently treats time as a dimension of reality. Pattern Field Theory rejects this, not as a stylistic preference, but as a structural necessity: time cannot be primitive if there is no prior structure for time to order.

### Core Mechanism: Time from Admissible Reconfiguration

Time emerges as the ordered sequence of admissible reconfiguration states in stacked relational layers under the Phase Alignment Lock (PAL).

More formally: once Dimension 2 (Relation) exists, configuration changes become possible. PAL then imposes admissibility and closure constraints on how relational configurations may update. The resulting sequence of admissible updates defines ordering. That ordering is time.

**Proposition 5.** *In PFT, time is an ordering relation induced by admissible reconfiguration under PAL; it is not an independent coordinate and cannot be an ontological dimension.*

Coherons are the minimal recurrence structures whose closure makes such ordering measurable as a repeatable unit.

### The PFT Bootstrapping Order

Pattern Field Theory specifies an explicit dependency order:

- Pre-dimensional: Metacontinuum (no identity, no relation).
- Dimensionality: the first admissible relational substrate (AOL adjacency and closure constraints).
- Persistence: minimal recurrence structures (coherons) become possible only on a relational substrate.
- Ordering: once recurrence exists and dependencies exist, a before/after ordering becomes necessary.

This means dimensionality comes first, persistence comes second, and time comes last.

## Why Mass Produces Time Dilation

In Pattern Field Theory, mass does not act on time. Mass acts on *update propagation*. Time is only the ordering index of those updates.

The mechanism is purely structural and follows inevitably from the ontology:

- Mass in PFT = high structural density / lattice strain / high Structural Regime Resolution (SRR).
- High strain = more constraints per admissible update.
- More constraints = more intermediate steps per effective change.
- More steps = slower propagation.
- Slower propagation = time dilation.

So:

> Mass does not slow time.
> Mass slows update propagation.
> Slowed propagation stretches the ordering index we call time.

General Relativity states:

> Mass curves spacetime, and curved spacetime slows time.

Pattern Field Theory states instead:

> Mass is structural strain in the update substrate, and time is made of update ordering.
> Slowing follows automatically.

Therefore:

- General Relativity describes the effect geometrically.
- Pattern Field Theory derives the effect mechanically.

The causal chain in PFT is explicit and unavoidable:

> Stacking creates dependency.
> Dependency creates ordering.
> Ordering is time.
> Speed only modulates how fast ordering advances.

Nothing new is being added here. This is already implicit in the theory:

- Time = ordering
- Rate = propagation efficiency
- Mass = structural strain
- Dilation = propagation slowdown
- Horizons = propagation failure

At a horizon, update propagation fails asymptotically. Ordering can no longer advance. Time stops. No singularities are required. No geometric metaphors are needed.

> This means the ontology is internally consistent, mechanically explanatory, and strictly stronger than the spacetime story.

This explanation feels "expectedly normal" because it demystifies gravity-time links: Mass is just relational density straining the update order that is time.

### Coherons Create Time (Not the Other Way Around)

**Definition 6** (Coheron)**.** *A coheron is the minimal closed, self-consistent recurrence in the space of admissible configurations. It is the smallest structure that can reassert identity by returning to the same configuration class and phase sector after a full cycle.*

Coherons are not objects inside time. Coherons are recurrence structures whose closure enables any meaningful ordering at all.

A coheron cycle traverses $N$ discrete phase sectors. Closure defines:

$$\tau = N\,\Delta t$$

Only when the loop closes does the structure reassert its identity.

**Proposition 6.** *A coheron recurrence cycle $\tau$ functions as a unit of time in PFT.*

This yields the core dependency:

> Without closure there is no identity. Without identity there is no recurrence. Without recurrence there is no time.

### Time as Ordering, Not a Dimension, Not a Rate

Time in Pattern Field Theory is not a rate. It is an ordering relation forced by dependency and recurrence. What is usually perceived as the "rate of time" is the rate at which admissible reconfiguration updates can propagate through stacked relational structure. Ordering is time. Propagation speed through the ordering sets the experienced tempo of time.

Time in PFT is defined as an ordering relation forced by recurrence and dependency:

> Time is the ordered sequence of admissible reconfiguration states produced by structured recurrence.

Equivalently:

> Time is the bookkeeping index of recurrence and dependency ordering.

### Impossibility Result

**Proposition 7.** *Time cannot be a dimension in PFT, because time is generated by coheron recurrence and therefore cannot pre-exist coherons as a container.*

If time were a dimension, coherons would have to exist in time. But coherons are the mechanisms that generate time by closure and recurrence. Therefore:

> Time cannot be the arena of coherons. Time is the product of coherons.

This is a structural impossibility: a generator cannot depend on its own product as a pre-existing container.

## Conclusion

A point is not zero-dimensional. A point is the first coordinate and therefore the first dimension.

A line is not the first dimension. A line is the first relation and therefore belongs to the second dimension.

A plane does not add a dimension. A volume does not add a dimension.

3D is 2D plus 1D.

Time is not a dimension.

There are only two dimensions:

> Identity and Relation.

## Glossary

**Identity**
The first coordinate; a self-consistent unit of distinction.

**Relation**
The second dimension; connection or traversal between identities.

**Metacontinuum**
Pre-dimensional null state.

**Geometry**
Emergent representational compression of relational structure.

**Emergent Time**
Ordering of relational state traversal.

**Coheron**
Minimal closed recurrence structure on the AOL; generates time as recurrence counting.

**PAL**
Phase Alignment Lock; coherence constraint enforcing phase-aligned closure across recurrence structure.

**AOL**
Allen Orbital Lattice; discrete relational adjacency substrate of admissible configurations in PFT.

**Recurrence $\tau$**
One full coheron closure cycle, $\tau = N\Delta t$, treated as a time unit in PFT.

**Allenix**
The availability-based logical grounding system of Pattern Field Theory. At every step it asks "What is available now?" and only permits constructions from already-available structure. Allenix is the mechanical enforcement of the Penrose Criterion.

**Penrose Criterion**
The internal consistency rule of Pattern Field Theory stating that nothing may be used in a construction unless it has already been justified by the theory itself. A theory may not assume as primitive anything that it claims to derive.

Allenix is the operational form of the Penrose Criterion inside Pattern Field Theory. At every step the question is: "What is available now?" The Penrose Criterion forbids importing any structure that has not yet been made available. Allenix enforces this rule mechanically by construction order.

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