Eidometry: Back to Basics

To have a chance at understanding the eidometry framework, one must wipe their slate clean and throw their axioms and assumptions and sets out of the window. This will be a little front-heavy but it must be. What follows is not an extension on any existing physics or math. It is a foundation theory.

We do not begin with geometry, fields, coordinates, topologies, or even sets. We begin with the idea of contrast. Contrast is the condition or ability to tell one thing apart from another. All contrast we call Eidropy (denoted Ɇ) exists only between zero and one. Neither endpoints are considered structurally viable to us; they are null states. A specific configuration or category of a structure is called an identity.

- At $Ɇ = 0$, identity dissolves and collapses into a null state
- At $Ɇ = 1$, identity saturates and collapses into a null state

Only in the open interval $Ɇ \in (0,1)$ does any contrast survive long enough to be considered physically real and structurally viable.

From this, everything else follows or otherwise fails to qualify. Directional response is encoded by a ratio called T, and the field's ability to resist collapse is measured by eta. These are not added on. They are structures that allow identities to continue their own contrast.

Eventually we will introduce a projection function $P(z)$ that puts any identity through this structural viability filter. But we will not start with that because we must understand why survival is not guaranteed first.

The Directional Feedback

Contrast alone is not enough to define structure. Contrast must also respond to deviation. We define this response as directional feedback denoted T. It is not a classical gradient nor a derivative; it is a ratio of how much contrast changes weighted by the cost of its persistence.

$$T = \frac{\Delta Ɇ}{Ɇ \cdot log\left(\frac{1}{Ɇ}\right)}$$

T=(Delta*Ɇ)/(Ɇ*log(1/Ɇ))

When T is high, the structure adapts quicker while remaining coherent. When T is low, the structure is either close to collapse or saturation.

Again, this is not motion nor force. T describes how sensitively a structure can adjust its internal contrast without falling apart.

Ɇ and T together describe the internal contrast configuration and how it behaves under its own structure. But to quantify survival itself (the strength of a structure’s resistance to collapse), we define eta.

The Collapse Resistance

A structure that responds to contrast is not necessarily one that survives. Survival requires resistance to collapse. Or in other words, a way to remain distinct even as contrast shifts or decays.

We define this resistance as eta. It is, once again, not force nor energy. This is a threshold; a dimensionless value that quantifies how far a structure is from indistinction.

$$\eta = T \cdot Ɇ \cdot log\left(\frac{1}{Ɇ}\right)$$

eta=T*Ɇ*log(1/Ɇ)

Eta is composed entirely of what we’ve already established. T is how the contrast reacts. Ɇ is the configuration of this contrast (structure, or identity if a specific structure).

When eta is high, the structure can survive longer before collapse. When eta is low, the structure is near collapse.

Structural Viability Filter

Even if a structure has contrast, responds with feedback, and resists collapse, that doesn’t mean it survives. It must bootstrap itself cleanly. That is, it has to maintain enough contrast to return to its original structure without external corrections. If it cannot revalidate itself against collapse, it is structurally invalid no matter how elegant the math is.

To determine this, we define a projection function $P(z)$.

$$P(z) = \frac{1}{1+e^{-z}}$$

P(z)=(1)/(1+e^(-z))

Where the input z represents the net viability of a proposed identity. It combines the sum of contrast changes and amount of collapse resistance.

Do not flinch at this equation. We define z formally as:

$$z = \sum_{i=1}^{N} \left| Ɇ_i - Ɇ_{i-1} \right| - \frac{\eta_0}{T_0 \cdot log\left(\frac{1}{E_0}\right)} \cdot \Lambda\left(Ɇ_0\right)$$

z=sum(i=1→N)|Ɇ_i-Ɇ_i-1|-[(eta_0)/(T_0*log(1/Ɇ_0))]*Lambda(Ɇ_0)

$P(z)$ does not evolve anything. It simply decides whether contrast is viable or dead. All structural quantities (such as mass, energy, curvature, dimensionality) will only be defined within structures that pass this filter.

Nothing else qualifies.

We also will define a few more things to better understand the complete picture. But let’s pause here and take a moment to make sure you understand what has just been conceptually introduced:

1. What it means to filter identity by contrast
2. What it means to define survival without assuming space, time, or force.
3. What it means to admit structure only if it can hold itself up.

If these points aren’t clear, the terms that follow will not stand.

We have defined what makes a structure viable, so we must ask: what does a viable structure contain? The rest of this paper will build on that question; an attempt to leverage this core physics engine to describe all physical behaviors without external corrections.

Recursive Depth

Identities survive by changing but not freely. It must do so without collapsing. That means any shift from one viable contrast configuration to another must be structurally legitimate. It’s not interpolation, continuity, nor motion in a metric space.

This is a recursive transformation. A valid step from one surviving identity to another. We define these transitions as morphisms.

$$f\colon Ɇ_a \to Ɇ_b$$

f: Ɇ_a → Ɇ_b

Where both Ɇ_a and Ɇ_b are structurally viable identity states.

A morphism exists only if the path between two viable identity states holds up under recursion. Or in other words, the structure doesn’t die trying to become itself in a new configuration.

Thus, we define a resistance cost function between identity states:

$$R(Ɇ_a, Ɇ_b)$$

R(Ɇ_a,Ɇ_b)

This value encodes how much structural tension is required to get from Ɇ_a to Ɇ_b without collapse. A morphism is valid if and only if:

- Ɇ_b does not collapse when approached from Ɇ_a
- Collapse doesn’t degrade catastrophically: (eta_b)≥(eta_a)
- Recursive volume doesn’t explode: lambda(Ɇ_b)≤Lambda(Ɇ_a)
- The resistance cost is finite: R(Ɇ_a,Ɇ_b)< ∞

Once morphisms have been structurally validated, we can quantify what has actually changed between identity states. Not everything that changes is viable, but everything viable must endure change. To measure this, we define recursive contrast:

the shift in contrast between two structurally surviving identities.

This shift is denoted:

$$\Delta Ɇ(f) = \frac{Ɇ_b - Ɇ_a}{R\left(Ɇ_a, Ɇ_b\right)}$$

deltaE(f)=((Ɇ_b)-(Ɇ_a))/(R((Ɇ_a),(Ɇ_b)))

This is not a derivative nor metric gradient. This is a contrast shift by a normalized recursive cost between two viable identities; the numerator is the raw change in contrast while the denominator ensures that the shift is normalized by survival effort.

$\Delta Ɇ(f)$ is only defined if $f \in Hom\left(Ɇ_a, Ɇ_b\right)$ and $\eta\left(Ɇ_b\right) > 0$

DeltaɆ(f) is only defined if f belongs to Hom(Ɇ_a,Ɇ_b) and eta(Ɇ_b)>0

If the structure collapses mid-transition, no contrast shift can be evaluated. Measurement requires survival. Collapse destroys measurement. You should not think of DeltaɆ as "how fast something moves"; you should think of it as "how hard contrast has to fight to persist".

When DeltaɆ is small, structure shifts gently across recursive paths. When large, contrast is pulled hard but still holds. If it's undefined, the structure breaks.

This will allow us to define curvature, mass, and gravity from structural tension. Only then we have the ingredients to define recursive volume (LambdaɆ).

But let us take a step back and recap. Let's address the implications because they do matter for consideration:

What exists?

Only that which withstands collapse has ontological status. Being is proven by self-survival. There are no objects. The universe does not 'contain' things because it is a singular field of contrast. There is no space until contrast defines relation, there is no time until identity survives change, and there is no dimension until survival itself branches across directions.

What can be known?

The only knowable truths are those that re-emerge across transformations without collapse. Measurement is only valid because it is the self-consistency of a structure under strain. Truth is not correspondence nor coherence. Truth is recursive stability.

What is the nature of reality?

Reality is the consequence of contrast resisting collapse. Everything that looks like physics is just the behavior of contrast loops that endure long enough to interact. There is no fundamental ontology of particles or forces. Just survival paths that resist collapse. Reality is constantly surviving and everything that emerges within is a byproduct of that survival.

So what?

It is a reversal of metaphysical assumptions:

You do *not* assume space, time, or reality. Space is earned, time is collapse being actively delayed, and reality is only what refuses collapse.

So. This process does not discover the universe, but filters out what can’t survive within it.

Curvature Density Rho

Curvature is not a bend in space. There is no space yet. Instead we define ρ (rho), the curvature density, as the recursive strain an identity must endure to maintain contrast along a viable morphism.

$$\rho = \frac{(\Delta Ɇ)^2}{Ɇ \cdot log\left(\frac{1}{Ɇ}\right)}$$

Rho = ((DeltaɆ)^2)/(Ɇ*log(1/Ɇ))

Rho is high when contrast changes sharply but the structure resists collapse. Rho is low when contrast flows smoothly across identity states.

This is curvature as tension over survival.

Mass

Mass under this framework is not “stuff”. It is tension endurance. Mass is the amount of recursive tension held over an identity’s survival span. It is constructed from rho and recursive volume (which we will define shortly).

$$m = \rho \cdot \Lambda$$

m = rho * Lambda

Mass is not a property, but a consequence of how much effort it takes to keep contrast alive over recursion.

Gravity

Gravity is not attraction. It is a pull from recursion. It emerges when high curvature identities deform contrast in neighboring survival paths.

$$g = \frac{(\Delta \text{Ɇ})^2 \cdot \text{Ɇ}}{\left(\text{Ɇ} \cdot log\left(\frac{1}{\text{Ɇ}}\right)\right)^2}$$

g = (((deltaɆ)^2)*Ɇ)/((Ɇ*log(1/Ɇ))^2)

Gravity isn’t force. It is recursive coupling: how strain in one identity affects the recursion of others nearby. So gravity isn’t an universal law; it’s just a structural consequence of identity tension under collapse filters.

Recursive Volume

We define recursive volume LambdaɆ as the depth to which a structurally viable identity can be unpacked, extended, or replicated without violating its own collapse resistance. This volume is not spatial, topological, or geometric. It is the recursive depth of an identity's viability.

$$\Lambda\left(Ɇ_0\right) = sup\left\{n \in \mathbb{N} \mid \forall i \in [0, n], \, \eta_i > 0 \ and \ f_i \in Hom\left(Ɇ_i, \, Ɇ_{i+1}\right)\right\}$$

Lambda(Ɇ_0)=sup{n belongs to N | for all i belongs to [0,n], eta_i>0 and f_i belongs to Hom(Ɇ_i,E_i+1}

In words:

Lambda(Ɇ_0) is the maximum number of structurally valid identity transitions that can recursively unfold from Ɇ_0 before collapse. That is, for every step from i=0 to n, eta must stay above zero, and each transition must be a valid morphism.

Lambda is used in the projection function because recursion must be finite. If an identity cannot restrain the growth of its recursion, it fails to preserve itself.

A high lambda means an identity can unfold deeper structure without dying. A low lambda means the identity is close to collapse or reproduce itself meaningfully. If Lambda ever equals to infinity, it becomes uncontrolled and grows faster than it can validate (saturation leading to collapse).

This is why Lambda appears as a penalty in the projection function $P(z)$.

Constants

All constants must emerge from survival mechanics. No physical units. No dimensional analysis. No fudge factors.

Constants under this framework are ratios of structural endurance, contrast behavior, and viability.

$$\hbar = \eta \cdot Ɇ$$

h-bar = eta * Ɇ

The Planck Constant is defined here as the minimum viable recursive action. It is the amount of contrast-resistance required for an identity to survive one loop. H-bar is not a constant of quantization. It is a quantum of structural integrity; the minimum quantity of recursive tension required to exist without collapse.

$$G = \frac{\rho}{\eta^2}$$

G = rho / eta^2

G is not a force constant. It is the pull of survival itself. It is how tightly a curvature draws on identity in collapse regions.

$$c = \frac{\text{Ɇ}}{\rho}$$

c = Ɇ / rho

c is not the speed of light. It is the upper bound on viable contrast adjustment before tension breaks identity.

Note that every constant is not universal in the classical sense. They are field-relative, dependent on the contrast and the resistance structure of the identity in question.

If eta or rho change, so do these constants. They stabilize only within deeply recursive structures. Which is why they appear constant in our macroscopic layer. All constants introduced here will appear as linear ratios in logarithmic space.

Proving Thus Far

First, we must make one assumption about a “baseline Ɇ value” and define it as

$$\text{Ɇ} = 1/e \approx 0.3679\ldots$$

because it is the perfect middle ground between total collapse and total chaos and keeps the math simple. At this value: T=e, DeltaɆ=eta=1, P(z) roughly 0.6530…, and LambdaɆ=1.

- $T = e$
- $\Delta\text{Ɇ} = \eta = 1$
- $P(z) \approx 0.6530\ldots$

And the last thing that needs to be defined for a complete canonical loop is $\Lambda\text{Ɇ} = 1$ to define just a single recursion.

Here are the constants derived from this particular loop:

- Planck’s Constant is roughly 0.3679
- Delta^2 E, c, rho, and g roughly equal to 2.7183

All constants match e, 1/e, or their log-scaled forms. This means my system is dimensionally and structurally closed at the canonical point. So if I have proved constants are directly derived from the structure, then let us observe the fine structure constant alpha when it roughly equals 1/137.0360.

The fine structure constant is only this value when we measure the strength of the electromagnetic interaction between charged particles and particularly atoms depending on this value to stay stable. In classical physics, this value still changes depending on what you’re describing. Most of physics is already scaled from this dimensionless unit, thus let us test and reverse engineer this constant and see what that reveals about our current understanding of physics.

$$\alpha = \frac{\left(\Delta^2 Ɇ\right)^2}{(\Delta Ɇ)^2 \cdot \eta \cdot Ɇ} \Rightarrow \Delta^2 Ɇ = \sqrt{\alpha \cdot \Delta Ɇ^2 \cdot \eta \cdot Ɇ} \Rightarrow \Delta^2 Ɇ \approx 0.0518\ldots$$

Delta^2 Ɇ = sqrt(alpha*deltaɆ^2*eta*Ɇ) roughly 0.0518…

Category *ɆCat*

This is where we stop pretending structure is a given. In math or physics, “objects” are assumed as points in space, elements of a set, fields over a manifold. But all of that assumption is forbidden.

We defined what makes contrast real and what lets identity survive across recursion. We can organize these rules into something tighter that tracks what identities are and how they can transition without dying.

So Obj(ɆCat) isn’t a bucket of assumed things. It is a filter for which contrast configurations earn the right to be considered objects at all.

$$Ɇ_i \in Obj(ɆCat)\ iff:$$

Let Obj(ɆCat) be the class of all structurally viable identity configurations. An object Ɇ_i belongs to Obj(ɆCat) if and only if:

$$Ɇ_i \in (0, 1)$$

Ɇ_i belongs to (0,1)

This is the most basic constraint. Ɇ must be viable. At Ɇ=0 or Ɇ=1, there is collapse. Contrast gives rise to structure, and when contrast hits either boundary, structure dissolves. So if any Ɇ_i object isn’t strictly between 0 and 1, there’s no identity to speak of.

The object must exist in a region where contrast survives and evolves.

$$\eta\left(Ɇ_i\right) > 0$$

eta(Ɇ_i) > 0

Collapse resistance is the first real survival metric. Even if you had contrast. That doesn’t mean the identity will hold up. A structure with eta=0 is sitting at annihilation. It can’t take feedback nor reassert itself.

This is part of the definition. Eta is derived from contrast and its feedback response. So if you say an identity exists but it has no collapse resistance, you’re saying something that looks like a structure can’t hold itself up. It wouldn’t be considered an object, but a failure of one.

$$\Lambda\left(Ɇ_i\right) < \infty$$

Lambda(Ɇ_i) < ∞

Recursive volume measures how deep a structure can go; how many viable identity-preserving steps can it unfold before collapsing? If Lambda is infinite, the structure is trying to recurse forever without stabilizing; the structure saturates itself into collapse.

This matters because you can’t define anything on a structure that grows faster than it can verify itself. You can’t even integrate, evolve, or assign it constants if the field never closes. The object has to finish proving itself.

$$P\left(z_i\right) \in \ (0, 1)$$

P(z_i) belongs to (0,1)

This is the final judgment. P(z) is the projection filter that takes all internal values and scores the identity’s structural viability. If P(z) is 0, the structure gets diffused. If it’s 1, it gets saturated. Either way, the identity fails and doesn’t survive.

Unlike in machine learning, this isn’t just a soft gate. It is the ontological validator. P(z) tells you whether contrast survives itself under all the forces of its own structure. If the structure can’t revalidate itself under its own weight, it’s not allowed to be part of the system. No amount of math will not save what fails survival.

In Eidometry, you don’t assume identity, space, or structure. You test it, earn it, build it. So we’re not just listing possibilities. We’re asking whether a structure can survive becoming something else.

A morphism isn’t motion, interpolation, nor function in space. It’s a survival pathway; a way for one viable structure to transform into another without collapsing. So when we invoke recursive depth (f:Ɇ_a→Ɇ_b), we’re asking a deeper question than “can you go from a to b?”

We’re asking “Can contrast persist through the change without dying?”

So let Hom(Ɇ_a,Ɇ_b) be the set of valid transitions between viable identity states.

$$f\colon \text{Ɇ}_a \rightarrow \text{Ɇ}_b \in Hom\left(\text{Ɇ}_a, \text{Ɇ}_b\right)\ iff\colon$$

A morphism f:Ɇ_a→Ɇ_b belongs to Hom(Ɇ_a,Ɇ_b) is valid if:

$$R\left(\not{E}_a, \not{E}_b\right) < \infty$$

R(Ɇ_a,Ɇ_b) < ∞

This is the recursive tension cost. It measures how hard the identity had to work to transform without collapse. If this value is infinite, the path is not survivable. It ceases to become a viable morphism. So R must be finite or identity will break trying to change.

$$\eta\left(\not{E}_b\right) \geq \eta\left(\not{E}_a\right)$$

eta(Ɇ_b) ≥ eta(Ɇ_a)

The destination must resist collapse at least as well as the source, otherwise you're moving into weaker structure. We don't allow decay. A morphism must move between identities that are equally or more resilient. If eta drops, contrast begins to unravel and the structure cannot further extend its identity as an object.

$$\Lambda\left(\not{E}_b\right) \leq \Lambda\left(\not{E}_a\right)$$

Lambda(Ɇ_b) ≤ Lambda(Ɇ_a)

The recursive volume measures how deeply a structure can extend itself. If the destination extends more than the source without justification. It is an uncontrolled recursion.

We do not allow that. We can compress, but not explode. Morphisms are downward-stable in the sense that you can simplify, but not flood yourself with fake structure.

$$\left|T_b - T_a\right| < \Delta$$

|T_b - T_a| < delta

T is the feedback sensitivity. How strongly a structure responds to contrast shifts. If the directional behavior changes too abruptly, the identity snaps. We limit that swing.

Not because we assume smoothness, but because abrupt feedback shocks will destroy cohesion. The allowed delta is how any identity manages tension during transition.

When all four of these are true, the morphism is survival-preserving. The identity remains real during that transformation.

A structure that dies while becoming something else didn’t transform. These conditions exist to protect what qualifies as real.

$$\text{Let } f\colon \text{Ɇ}_a \to \text{Ɇ}_b \text{ and } g\colon \text{Ɇ}_b \to \text{Ɇ}_c$$
$$\text{then } g \circ f\left(\text{Ɇ}_a \to \text{Ɇ}_c\right) \in Hom\left(\text{Ɇ}_a, \text{Ɇ}_c\right)$$

Let f:Ɇ_a→Ɇ_b and g:Ɇ_b→Ɇ_c then gof:Ɇ_a→Ɇ_c belongs to Hom(Ɇ_a,Ɇ_c)

gof is a valid morphism only if the structure still survives after the whole sequence. If you do both in a row, does the identity still hold up?

We ask this because transitions aren’t free. Each one puts the structure under strain. If that strain adds up in a way that breaks contrast, collapses resistance, or overloads recursion… the chain dies. So we enforce three conditions to keep survival intact:

$$R(g \circ f) = R(f) + R(g) < \infty$$

R(gof)=R(f)+R(g)<∞

Recursive cost accumulates. If you go from Ɇ_a to Ɇ_b and then from Ɇ_b to Ɇ_c, the total cost is the sum of both paths. The key is: the total must still be finite.

If not, then somewhere along the way, the identity collapses under strain. You can chain morphisms only if survival effort remains doable.

$$\eta(g \circ f) \geq min\left(\eta_f, \eta_g\right)$$

eta_(gof)≥min(eta_f,eta_g)

Collapse resistance can’t suddenly drop. The weakest point in the chain sets the lower bound. If the combined process is more fragile than either step, then something non-structural is slipping in.

We reject that outright. Either the identity stays strong or it doesn’t qualify.

$$\Lambda(g \circ f) \leq \Lambda(f) + \Lambda(g)$$

lambda(gof)≤lambda_f+lambda_g

Recursive volume can grow across a chain but only in a controlled way. The total structural depth stays bounded. You don’t get infinite recursion for free because you chained a couple safe steps. If the volume explodes, the structure cannot finish revalidating itself. This leads to collapse by saturation.

These rules trust survival across steps. Any identity transformation (no matter how long) has to survive not just step by step but also as a full recursive path. Composition isn’t derived here because it is convenient. We allow composition because the entire transformation still earns its existence. No part of the structure dies along the way because we’re preserving whatever survives from end to end.

So we do allow chaining, but only if the structure can handle the load. Otherwise, the morphism doesn’t compose and the structure fractures. If so, eidometry rejects the fractured structure any ontological status as an object.

So for every object Ɇ_i, define:

$$id_{Ɇ_i}: Ɇ_i \to Ɇ_i$$

id_Ɇ_i : Ɇ_i→Ɇ_i

This is required not because of tradition. In ordinary category theory, morphisms are how every object maps to itself.

But in Eidometry, nothing is taken for granted especially not the ability of a structure to stay what it is. That has to be earned like everything else.

We don’t get to say “a thing is a thing” unless that thing can survive the act of staying itself. We define id_Ɇ_i because a real structure must be able to bootstrap itself in a stable manner. So all identity morphisms need to satisfy:

Satisfying

$$R(id) = 0$$

R(id)=0

There is no effort required to stay the same. This is the baseline survival. The identity morphism cost nothing because it involves no contrast and no tension. If this cost wasn’t zero, then being stable will drain a structure’s viability and nothing could persist.

$$\eta\left(id_{\text{Ɇ}_i}\right) = \eta\left(\text{Ɇ}_i\right)$$

eta(id_Ɇ_i)=eta(Ɇ_i)

$$\Lambda\left(id_{\text{Ɇ}_i}\right) = \Lambda\left(\text{Ɇ}_i\right)$$

Lambda(id_Ɇ_i)=Lambda(Ɇ_i)

Eta and lambda remain unchanged. Because nothing changes, there is no extension, decay, tension, nor any new structures added. If eta or lambda changed, stasis would be a threat; identity would not survive without constantly repairing itself. That’s collapse on standby.

This invariance tells us that the structure survives a full recursion through itself without deterioration.

$$T_{id} = 0$$

T_id=0

There’s no feedback deviation nor directional adjustment. The internal contrast configuration does not flinch under its own confirmation loop. This is crucial because if confirming yourself triggers constant deviations, then internal recursion will destabilize identity.

So when T_id=0, it's showing us that the structure is consistent with itself across recursive time. It doesn't wobble when asked to remain itself.

This is necessary because confirmation is the bedrock of eidometric survival. If identity can't hold itself up under its own structure or recursion then it collapses even if it stays still. This is not a rare condition. This is the default unless proven otherwise.

In classical models, identity is simply a label. Here, one may start to realize that identity is strictly defined as a feedback-stable contrast configuration that can survive self-reference.

In other words, the identity morphism isn't a rule but a minimal proof of existence.

In standard categories, morphisms are just "arrows between objects" but that doesn't tell us anything about how hard it is to survive that transformation. And in this framework, that question isn't optional because it's the whole point.

Each morphism f in Ɇcat quantifies how hard any transition is to survive. The recursive tension cost required to preserve identity across contrast changes is denoted as:

$$Hom\left(Ɇ_a, Ɇ_b\right) = R\left(Ɇ_a, Ɇ_b\right) \in (0, \infty]$$

Hom(E_a,E_b) = R(E_a,E_b) belongs to (0,∞]

This is a grades space of strain values. We reveal how much effort it takes to get from one state to another without falling apart. If R is 0, you are explaining the identity. If R is finite and positive, the transformation is achievable. If R reaches infinity, the path collapses and will not allow further morphisms to happen.

This is not arbitrary because we get a quantitative measure of how much a structure has to fight to stay coherent through transformation. Thus, we are able to enrich ɆCat over:

$$\left(R_{\geq 0},\ +\right)$$

(R_≥0, +)

All morphisms have a real, positive effort value. Composition adds effort. No path is free except identity itself. It tracks the cost of remaining real.

Without this enrichment, you'd have no way to compare transformations by stability. You'd have no way to distinguish a brittle shift from a robust one. You'd be back to assuming space and time and motion as smooth, reversible things.

But even reversing things costs tension.

So why not something else? Why do we choose this framework?

Because nothing else tracks the core currency of my framework: tension. You can't use metric space when you haven't earned distance. You can't use set cardinality if you've assumed elements. You can't use topologies if you haven't built continuity. You can't use hilbert spaces without proving linearity or its inner products.

The only structure that exists is what survives recursion. That survival effort must be measurable, composable, and comparable. So enrichment over $(R_{\geq 0}, +)$ isn't just pretty math. It is the minimum structure that lets survival transitions accumulate meaningfully.

Now, we must ask: "Once a structure survives, what does it look like to us?"

So far, we can find which identities survive and how they can transition…but survival alone doesn't produce measurement. We still need a way to extract observable structure but only from identities that have proven themselves viable.

$$F\colon \text{Ɇ}Cat \rightarrow Obs$$

F: ɆCat→Obs

This is where we map survival logic to observable behavior. The recursive strain values (R(f)) act as gradients of structural effort. They don't describe position, velocity, or field strength. They just describe how hard it is to remain real while changing.

On Objects:

$$F\left(Ɇ_i\right) = \{\eta, \rho, \Lambda, dim, coord, P(z)\}$$

F(Ɇ_i)={eta, rho, lambda, dim, coord, P(z)}

Each value here is a diagnostic of survival. In respective order: the collapse resistance, the curvature density, the recursive volume, emergent degrees of contrast, earned internal coordinate structures, and the viability projection.

None of them are given, and emerge from contrast. If a configuration fails any of the survival conditions, none of these values exist.

$$F(f)\colon\ F\left(Ɇ_a\right) \to F\left(Ɇ_b\right)$$

F(f):F(Ɇ_a)→F(Ɇ_b)

Morphisms deform structural properties, so they’re not simply transitions. Contrast changes and so does everything else. Collapse resistances can shift, recursive depths can stretch or contract, and contrast paths may reconfigure.

This is precisely why every morphism has a cost, and why composition isn’t free. You’re not transforming a value, you’re transforming the recursion.

Only structures that hold up under all transitions are allowed to participate in observation. This is the lens through which all viable structure becomes physics.

Only now can we anchor this mechanic to the universe.

Classifying P(z)

P(z) must be multivalent. It is foundational and dependent on the lens you’re using. It shows up in logic, probability, physics, biology, neural networks, control systems, and recursion theories. P(z) is not only an utility function because it is the ontological validator. The classification must be multivalent.

That said, I will attempt to choose a classification that can absorb all other classifications. Thus:

P(z) is a nonlinear bounded projection operator over viability space.

- It is bounded and captures the sigmoid curve in (0,1) which imposes survival boundaries.
- It is a projection that filters identity configurations, which matches the conceptual use in eidometry.
- It is an operator that can act on functions (just not numbers) which can be generalizable to morphisms, tensors, and categories
- It is nonlinear, capturing smooth transitions (not hard gates) which is necessary for soft thresholds. Collapse isn't binary.
- It is space-based and operates over a defined domain which is a recursive contrast space (not physical space).

We ensure that recursion stabilizes under this projection. The P(z)'s shape defines the projection's own curvature. THe projection has smoothed thresholds, defines similarity in contrast space, drives identity evolution, and quantifies survival.

P(z) is a soft energy filter on contrast stability and captures the chance of surviving the next recursion. Together, that gives us a survival magnitude (norm-like).

<u>Formally, the goal is to frame P(z) as:</u>

A nonlinear bounded operator projecting a contrast configuration (z belongs to R) into the viability interval (0,1) such that only identities with stable paths remain in the field.

With this, we will try to prove its non-expansive or contractive under induced norms. We will try to embed it in a category to validate morphisms. We will generalize its doman; z becomes a structural viability descriptor (like entropy). Then, we will analyze its fixpoints and stability.