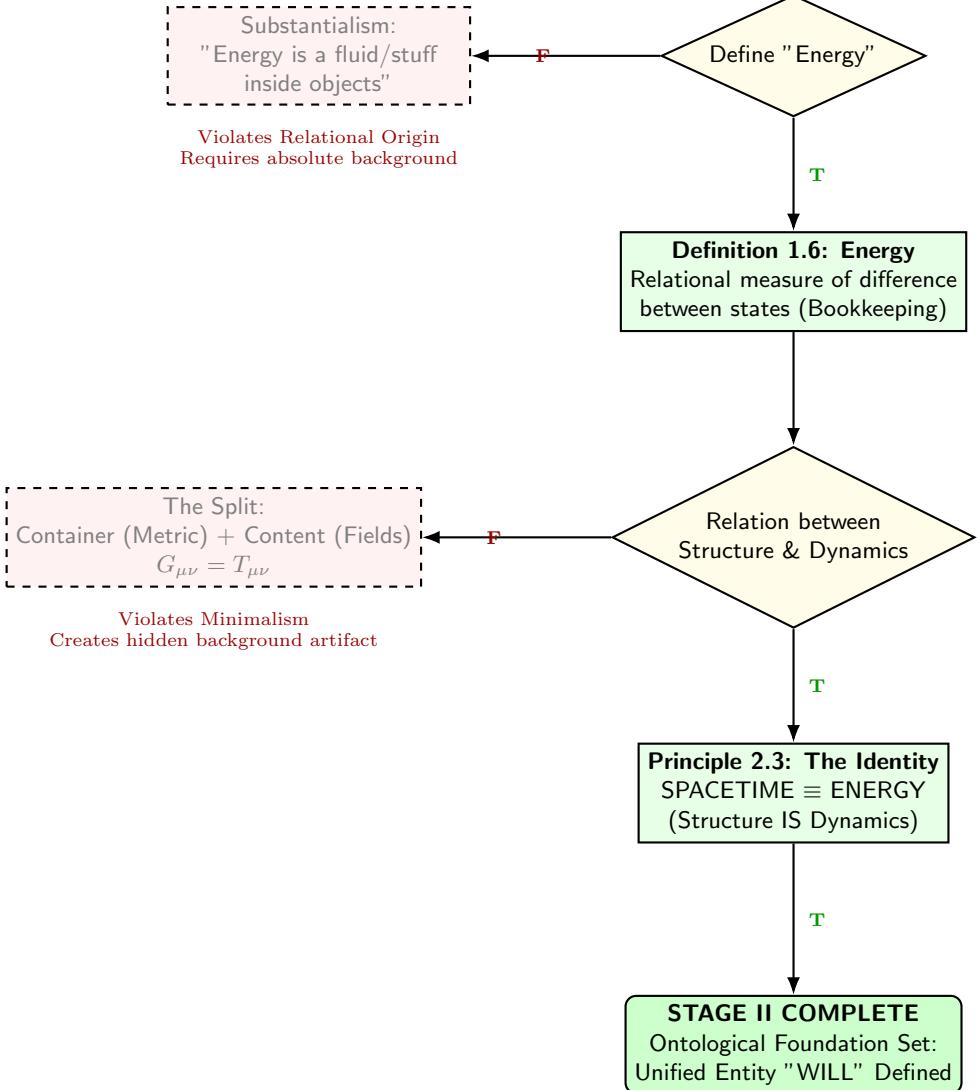


INPUT FROM STAGE I
Methodology Established:
(No Hidden Assumptions, Relational Only)



INPUT FROM STAGE II
Ontology: SPACETIME \equiv ENERGY
(One Relational Difference Δ)

Derived Constraints

1. Closure (No leakage)
2. Conservation (Fixed budget)
3. Isotropy (Max symmetry)

Choose a **Closed Bookkeeping Domain?**

III-defined Domain:
No boundary / no accounting
 \Rightarrow Leakage undetectable

Violates Closure (No leakage).
Problem is *bookkeeping*, not geometry.

Theorem 3.4 (Minimal Direction Carriers):
Carriers encode *directions of relations* (not positions).

- 1) **Directional Relation** ($A \rightarrow B$):
Requires 1 DOF \Rightarrow Carrier: S^1
- 2) **Omnidirectional Relation** (Center \rightarrow Field):
Requires 2 DOF \Rightarrow Carrier: S^2

Define State
on Carriers (S^1, S^2)?

Scalar Substance:
"Energy as stuff"

Violates Relational Origin.
A state needs internal/external reference.

Lemma 6.1: Duality of Evolution
State \equiv Superposition of Orthogonal Axes:
 1) **Amplitude** (External interaction)
 2) **Phase** (Internal existence)

Thm 6.2: Orthogonal Conservation
Fixed budget \Rightarrow fixed norm (no double counting)
 S^1 (**Kinematics**): β^2 (Motion) + β_Y^2 (SpaceTime) = 1
 S^2 (**Gravity**): κ^2 (Potential) + κ_X^2 (TimeSpace) = 1

Lemma 10.1: Isotropy \Rightarrow Equal Budget per DOF
No preferred direction \Rightarrow no preferred DOF
 \Rightarrow budget assigns equally per independent DOF

Derive Exchange Rate
between Active Amplitudes?

Theorem 10.2: Energetic Exchange Rate
Equal budget per DOF \Rightarrow

$$\mathcal{R} = \frac{\text{DOF}(S^2)}{\text{DOF}(S^1)} = \frac{2}{1} = 2$$

$$\kappa^2 = 2\beta^2$$

STAGE III COMPLETE
Geometry Established:
Budget flows between Orthogonal Axes
and between Direction Carriers ($S^1 \leftrightarrow S^2$)

INPUT FROM STAGE III
Geometry Defined:
Orthogonal Conservation Laws on S^1 & S^2

Define Physical Meaning of Vertical Projection (β_Y)

Independent Parameter
(Mass as intrinsic substance)

Ontologically redundant

Def 7.1 & Thm 7.2: Self-relation (Motion=0) → Invariant Mass
Vertical Projection ≡ Rest Existence
 $E \cdot \beta_Y = E_0 \equiv m$
 $\gamma = 1/\beta_Y$

Corollary 7.3: Energy-Momentum

Apply Pythagoras to S^1 Closure:

$$(E\beta)^2 + (E\beta_Y)^2 = E^2$$

Identify $p \equiv E\beta$, $m \equiv E\beta_Y$

$$E^2 = p^2 + m^2$$

Explain $m_i = m_g$

Weak Equivalence Principle
(Postulated as Axiom)

Descriptive physics
(Coincidence)

Theorem 12.2: Unified Scaling
Kinematics (S^1) and Gravity (S^2)
act on the SAME invariant E_0 .

$$m_i \equiv m_g \equiv E_0$$

STAGE IV COMPLETE

Physics Derived:
SR/GR effects are geometric projections
of invariant Rest Energy

| |
|--|
| $\theta_1 = \arccos(\beta)$, $\theta_2 = \arcsin(\kappa)$ |
| $\kappa^2 = 2\beta^2$ (Closure) |

| Algebraic Form | Trigonometric Form |
|----------------------------------|-----------------------------|
| $\beta = v/c$ | $\beta = \cos(\theta_1)$ |
| $\kappa = \sqrt{R_s/r}$ | $\kappa = \sin(\theta_2)$ |
| $\beta_Y = \sqrt{1 - \beta^2}$ | $\beta_Y = \sin(\theta_1)$ |
| $\kappa_X = \sqrt{1 - \kappa^2}$ | $\kappa_X = \cos(\theta_2)$ |

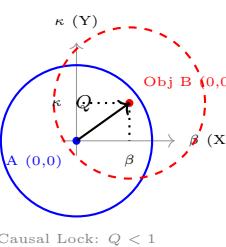
INPUT FROM STAGE IV
Physics Derived:
Invariant Mass & Unified Scaling Established

Define Interaction Measure
(Distance/Difference)

Spatial Distance
(Metric ds^2 in background)

F

Violates Relational Origin
(Sec 10)



Sec 10: Relational Displacement
Self-Centering Reciprocity:
 $Q^2 = \beta^2 + \kappa^2$
Norm of deviation from observer

T

Define Interaction Mechanism
(Dynamics)

Forces / Potentials
(Newton, Lagrange, Hamiltonian)

F

Ontologically "dirty" approximations
Collapse 2-point relation to 1-point
(Sec 15)

Theorem 14.1: Energy-Symmetry Law
Causal Continuity:
 $\Delta E_{A \rightarrow B} + \Delta E_{B \rightarrow A} = 0$
Transfers must sum to zero

T

Define "Zero Point"
(Reference System)

Hypothetical Observer
at Infinity (∞)

F

Idealized/Non-existent.
leads to Gauge Ambiguities

Self-Centering Principle
Zero is ALWAYS the state of
a local relational frame (A or B)

T

Formalize Energy Description

Formalisms L, H
Energy as intrinsic scalar
at a single point

F

Ontologically "murky".
Mathematically inflated.
(Collapse of 2-point relation)

Explicit Transition Cost
Energy as Work of Translation
from State A to State B
 $\Delta E_{A \rightarrow B}$

T

STAGE V COMPLETE
Dynamics Defined:
Motion is the payment of energy cost
to maintain Causal Symmetry

INPUT FROM STAGE V
Dynamics Defined:
Motion is Algebraic Necessity

If Method F was chosen

Result of Method T

EFFECTS OF BAD PHILOSOPHY
(Descriptive Physics)

1. Inflated Formalism: Equations multiply to hide ontological errors.
2. Loss of Transparency: Meaning hidden behind coordinates.
3. Fragmentation: Separate constants for every domain.

EFFECTS OF GOOD PHILOSOPHY
(Epistemic Hygiene)

1. **Simplicity:** Complexity collapses into geometry.
2. **Transparency:** 1 Symbol = 1 Idea.
3. **Unity:** Scale invariance from Quantum to Cosmic.

GENERAL CONSEQUENCE:

**"Mathematical complexity is the symptom
of philosophical negligence."**

Once ontological symmetry is restored, **Nature's laws reduce to algebraic self-consistency.**

INPUT FROM STAGE VI
Energy Symmetry Law Established
 $(\Delta E_{A \rightarrow B} + \Delta E_{B \rightarrow A} = 0)$

Define Orbital Mechanics

Input: Mass (M) & Constant (G)
Mechanism: Forces or Metric Curvature
Method: Differential Equations

Violates Operability.
 M and G are not direct observables.
(Sec 16)

Relational Orbital Mechanics (R.O.M.)
Inputs: Direct Optical Projections
1. β (Doppler Shift)
2. κ (Gravitational Redshift)

Theorem 16.2: Geometric Eccentricity
Eccentricity is the measure of "Closure Defect" (δ):

$$e = \frac{1}{\delta_p^2} - 1$$

"Eccentricity \equiv Energy Deviation"

Derive Precession ($\Delta\varphi$)

Solve Geodesic Equation
 $\frac{d^2x^\mu}{d\tau^2} + \Gamma^\mu_{\nu\lambda} \cdots = 0$

High Mathematical Inflation.
Requires Metric Tensor.

Sec 16.5: Universal Precession Law
Pure Algebra of light "Red vs Blue" at perihelion

$$\Delta\varphi = \frac{3\pi}{2} \frac{\kappa_p^4}{\beta_p^2}$$

Ratio of Potential (Red) to Kinetic (Blue) at perihelion

STAGE VII COMPLETE

"Mass" is obsolete.
Gravity is solved via Algebra of Light.
Predictions verified (Mercury, S2, S4716)

INPUT FROM STAGE VII
 Dynamics is Geometric.
 Pure Algebra of Projections (κ, β)

Define "Matter" Density (ρ)
 Connect 2D Geometry to 3D Data

"The Cannonball Principle"
 Assumption: Mass is "stuff" filling
 a 3D volume uniformly.
 $\rho = M/V$

Violates Minimalism.
 Assumes a priori 3D container.
 "Cultural Artifact" of Newton.

F

T

Sec 17.1: The Translation Interface

No new assumptions.
 Translate 2D Surface Data (S^2) to 3D Proxy.
 Normalization by sphere area (4π):

$$\rho = \frac{1}{4\pi} \left(\frac{\kappa^2 c^2}{2Gr^2} \right)$$

The Density Identity
 Local Density \equiv Relational Projection

$$\rho = \frac{\kappa^2 c^2}{8\pi Gr^2}$$

$$\kappa^2 = \frac{\rho}{\rho_{\max}}$$

Sec 17.3: Intrinsic Pressure
 If Density is Geometry (κ^2),
 then Pressure is Geometric Tension.

$$P = -\rho c^2$$

(Analogue to Surface Tension)

T

STAGE VIII COMPLETE
 Matter is not "stuff" in a box.
 Matter is the intensity of
 relational curvature.

INPUT FROM STAGE VIII

Density Identity Established:

$$\kappa^2 = \rho / \rho_{\max}$$

Sec 18: Unified Geometric Field EquationCombine Geometry (R_s/r) and Density Ratio:

$$\kappa^2 = \frac{R_s}{r} = \frac{\rho}{\rho_{\max}}$$

Geometry \equiv Energy State**Mathematical Singularity**

$$r \rightarrow 0 \implies \rho \rightarrow \infty$$

Breakdown of Theory

Artifact of coordinate systems.
"Bad Philosophy" result.

F**Determine Behavior at Limits
(High Energy/Small Radius)****T****Sec 19: Natural Bounds**Geometry is closed (S^2).

$$\kappa^2 \leq 1 \text{ (Horizon Limit)} \implies \rho \leq \rho_{\max}$$

$$\rho_{\max} = \frac{c^2}{8\pi G r^2}$$

No Singularities, only Saturation

T**STAGE IX COMPLETE**

Field is finite and self-limiting.

Black Holes are non-singular
saturated energy states.

